

March 31, 2016

Mike Heiligenstein
Executive Director
Central Texas Regional Mobility Authority
3300 N. IH-35, Suite 300
Austin, Texas 78705

Re: 2016 Annual Report of Conditions – 183A Turnpike / Manor Expressway

Dear Mr. Heiligenstein:

We are pleased to submit the 2016 Annual Report of Conditions for the 183A Turnpike and Manor Expressway. This joint report sets forth our findings as to the condition of the 183A Turnpike and Manor Expressway, as well as our recommendations of proper maintenance, operation, and repair of the facilities during 2016-2017.

To determine the physical condition of the roadways, structures, and related facilities and equipment, inspections of the facilities were performed. In November and December 2015, HNTB conducted a visual inspection of all portions of the 183A Turnpike and Atkins conducted a similar inspection of the Manor Expressway. Bridges are inspected by the Texas Department of Transportation (TxDOT) every two years per applicable federal requirements in accordance with the National Bridge Inspection Program (NBIP) and the findings of the most recent NBIP inspections were reviewed and are reflected in this report for both facilities. The following report summarizes the conditions observed and are fully reported in the 2016 Annual Detailed Inspection Report transmitted to the Mobility Authority's Director of Engineering.

We appreciate the opportunity to provide the services required of the General Engineering Consultants, and we wish to acknowledge the excellent cooperation of the Mobility Authority staff in the performance of these services.

Sincerely,



Michael A. Hutchison, P.E.
Associate Vice President
HNTB Corporation



Alastair Miller, P.E.
Vice President
Atkins

Enclosure

Copies to: J. Word, CTRMA
B. Chapman, CTRMA
File



CENTRAL TEXAS
Regional Mobility Authority

2016 Annual Report of Conditions
183A Turnpike – HNTB
Manor Expressway - Atkins

TABLE OF CONTENTS

Page

183A Turnpike

Introduction.....	1
Inspection of Facilities	2
Annual Report of Conditions	3
1. Annual Visual Inspections	3
1.1 Roadways.....	3
1.2 Bridges	9
1.3 Buildings	10
1.4 Toll Collection System.....	12
1.5 Retaining Walls	12
2. Recommendations	13
2.1 Recommendations from Annual Visual Inspections.....	13

Manor Expressway

Introduction.....	16
Inspection of Facilities	17
Annual Report of Conditions	18
1. Annual Visual Inspections	19
1.1 Roadways	20
1.2 Bridges	21
1.3 Buildings.....	23
1.4 Toll Collection System	25
1.5 Retaining Walls	26
1.6 Overhead Sign Bridges.....	27
2. Recommendations	28
2.1 Recommendations from Annual Visual Inspections.....	29

On-Going Initiatives

1. Ongoing Initiatives.....	31
1.1 Pavement Management.....	31
1.2 Preventative Maintenance Programs	31

Budget

1. Annual Budget.....	32
1.1 Annual Operating Budget	32
1.2 Annual Maintenance Budget	32
1.3 Annual Capital Budget.....	33
2. Renewal and Replacement Fund.....	33

183A Turnpike



In accordance with the terms of Section 712 of the Master Trust Indenture, the Mobility Authority shall require the General Engineering Consultant (GEC) to make an inspection of the System, at least once in the Fiscal Year following the Substantial Completion of the initial Project (183A Turnpike) funded with Bond Obligations and in each Fiscal Year thereafter. The System is currently comprised of the 183A Toll Road and the Manor Expressway Project. This report addresses only 183A.

Following each inspection and on or before the 90th day prior to the end of each Fiscal Year, the GEC shall submit to the Mobility Authority a report setting forth:

- i. its findings as to whether the System has been maintained in good repair, working order, and condition;
- ii. its advice and recommendations as to the proper maintenance, repair, and operation of the System during the ensuing Fiscal Year; and
- iii. an estimate of the amount of money necessary for such purposes, including its recommendations as to the total amounts and classifications of items and amounts that should be provided for in the Annual Operating Budget, the Annual Maintenance Budget, and Annual Capital Budget for the next ensuing Fiscal Year.

Copies of such reports are to be provided to the Trustee by the Mobility Authority.

Inspection of Facilities



183A Turnpike at Park Street looking South

In compliance with the requirements of the Master Trust Indenture, HNTB Corporation, as GEC, conducted a visual inspection of the entire 183A Turnpike in November and December of 2015. The inspection covered the 183A facility including: pavement; edging and curbing; various walls; cut sections and embankments; pedestrian bridges; roadway lighting; drainage structures; signs and pavement markings; interchanges, including toll plazas, Traffic Operations Center, ramps, and equipment; and other facilities, such as shared use path and sidewalks, within the 183A Right-of-Way. Tolling equipment was not included as it is inspected by a separate entity.

The level of inspection which forms the basis for this report is a general visual observation. The opinions, statements, and recommendations made in this report are based solely on conditions revealed by this visual inspection. No representation or warranty is made that all defects have been discovered or that defects will not appear later.

A "183A Turnpike Detailed Inspection Report", describing the inspection findings is transmitted separately to the Mobility Authority's Director of Engineering.

Annual Report of Conditions

The statement of conditions of the toll road facility and the recommendations in this report are based on the findings of the above-noted visual inspections and a review of current operating practices and agency organization. This report sets forth conclusions and recommendations concerning the condition, maintenance, repair, and operation of 183A and its various facilities; the amount of funding necessary for the proper maintenance, repair, and operation of the toll road during the ensuing Fiscal Year (2017); and the amount of funds available in the Renewal and Replacement Fund.

There were no major ongoing construction activities on the 183A Mainlanes during the Fall 2015 inspection period. However, there was minor construction in progress during the 2015 inspection period adjacent to the project at the southwest corner of the Southbound Frontage Road and New Hope Drive. This included construction of a new concrete driveway and metal-beam guard fence within the 183A ROW.

1. ANNUAL VISUAL INSPECTIONS

The inspection of 183A facilities in November and December 2015 was conducted to evaluate the general condition of the Mobility Authority's assets and identify any deficiencies present that may require attention or repair. The inspection conducted for this report consists of general visual observations and is not based on detailed in-place testing unless noted specifically. The opinions, statements, and recommendations in this report are based solely on conditions observed during the inspection.

1.1 ROADWAYS

The visual inspections consist of general visual observations, revealing areas where the existing conditions of these roadways require attention.

For the purpose of this report, the existing roadway conditions were rated and are grouped by the following categories:



183A Turnpike at Brushy Creek looking North

- **Pavement and Shoulders** – condition of pavement, shoulders, curbs and curb inlets, and their associated joints.
- **Riprap** – condition of riprap structures and their associated joints, including concrete slope protection, flumes, and abutment slopes.

- **Drainage** – Deficiencies associated with inadequate drainage at roadside inlets, culverts, pipes, grates, flumes, and weepholes.
- **Signs** – conditions associated with mainlane and ramp signing (not including signing at toll plazas), trailblazers, and route markers.
- **Striping & Delineation** – condition of striping, pavement graphics, raised reflective pavement markings, and delineation.
- **Concrete Barriers** – condition of concrete barriers and bridge rail.
- **Guardrail & Attenuation** – condition of metal beam guard fence (MBGF) and its components, terminal anchors, single guardrail terminals (SGT), and various crash attenuation systems.
- **Coating** – conditions such as peeling, absent, or damaged coatings on concrete traffic barrier, concrete traffic rail, or other coated surfaces.
- **Fencing** – condition of chain-link, barbed wire, and ornamental fencing at the ROW, or within maintenance limits.
- **Lighting** – conditions associated with ramp lighting structures and its components.
- **Landscape Areas** – condition of the various landscaped areas, plantings, streetscape elements and other surface treatments.
- **Shared Use Path** – condition of the sidewalk, pedestrian bridges, retaining walls, markings, and signage for the Shared Use Path.
- **Ponds** – condition of the pond berms, sedimentation basins, sand filtration basins, concrete retaining walls, block retaining walls, riser structures, inlet and outlet structures, splitter boxes, manholes, riprap, and access ramps.

A summary of the condition of 183A is described as follows:

The inspection conducted during the Fall 2015 period verifies that 183A continues to provide a well-maintained route that connects Leander and Cedar Park to the downtown Austin area. The area around 183A continues to see new developments, with more expansion planned for the future. The new growth in Williamson County and the subsequent increased traffic will require continued inspection and maintenance of 183A in the following years.

Asphalt Pavement:

Although minor issues were noted, the inspection conducted in Fall 2015 did not identify any major deficiencies in the asphalt pavement that affect the safety and operations of 183A. There was chipped curb and longitudinal cracking at many of the transitions from asphalt to concrete pavement on ramps (see pictures below). It should be noted that the northbound and southbound frontage roads from RM 1431 to approximately 1000 ft. north of San Gabriel Parkway, excluding sections at 183A and Scottsdale Drive, were repaved in the Fall of 2014. The sections at Scottsdale drive were repaved in 2012 with the construction of 183A Phase II, and are in good condition.



Observed Transverse Crack at Ramps



Observed Chipped Curb

Concrete Pavement:

Concrete pavement along the mainlanes and frontage roads was found to be in good conditions, with some minor deficiencies present. The most prevalent deficiency was transverse cracking, which occurred at various locations along the mainlanes. While transverse cracking is common with concrete pavement, it is a relatively minor issue and does not affect safety and operations at this time. This issue does not require immediate attention, however it should continue to be monitored during future condition inspections.

Two small potholes were identified along the concrete pavement – one located on the southbound mainlane just north of RM 1431 and the other in the southbound entrance ramp at Brushy Creek, just South of the toll gantry. These deficiencies may affect vehicles along 183A and should be repaired in a timely manner.



Observed Pothole on Brushy Creek ramp



Observed Transverse Cracking

The northbound mainlane approach to the bridge over Lakeline Blvd is not a smooth approach and as the speeds have increased on 183A over the years the uneven pavement transition from the roadway section to the bridge section is more noticeable and may be getting worse. It is recommended in the upcoming year or two to improve this transition.

Riprap:

Concrete riprap throughout the project was in good condition with only minor cracking present and a few rust stains under the pedestrian bridges.

Drainage:

Drainage elements overall were found to be in good condition with only minor deficiencies. There was sediment buildup in some of the inlets. Minor to moderate erosion was present in several ditches and berms and at bridge drain outlets. Some driveway culverts and pond inlets were partially clogged. Some examples are shown in the pictures below.



Erosion between SBML and SBFR



Clogged Inlet Pipe

Curb and Gutter:

The curb and gutter along 183A had no major issues, but showed signs of wear along the length of the frontage roads and mainlanes. Breaks, cracks and spalls were present in various locations. Although these issues do not affect safety and operations of the facilities, the more prominently broken curbs should be repaired.

Striping and Delineation:

The Phase I mainlanes and ramps were observed to have significant areas of fading pavement markings, particularly at crosswalks and at ramp gores. Restriping may be needed where pavement markings are fading or missing completely. Pavement marking in Phase II was in fairly good condition, with isolated areas experiencing cracking or fading. Delineators on concrete rail and metal beam guard fence, and at gores, were missing throughout the corridor and should be replaced.



Observed Crosswalk Fading



Observed Missing Buttons

Signage:

A reflectometer was used to test the reflectivity of a random sampling of 20 signs along the frontage roads and main lanes of 183A in the Fall of 2014. Although some signs were visibly more worn than others, all that were tested greatly exceeded the minimum threshold. In addition, a nighttime visual inspection was performed during the Fall 2015 inspections. All signs were clearly visible and legible to the inspector. The signs along 183A are still in good condition and do not need to be replaced at this time. It is recommended that reflectivity testing be performed every 3-5 years to ensure compliance with requirements.

Concrete Barrier Rail:

The Single Slope Traffic Rail (SSTR) along 183A was in generally good condition; however there were a few locations along the mainlanes with noticeable damage. The damage along the SSTR is more detrimental to the visual appeal of the structure than to its functionality; however the barrier should be repaired as part of facility maintenance.

Guardrail and Attenuation:

The Metal Beam Guard Fence (MBGF) and attenuators throughout the project were in generally good condition with minor deficiencies in the form of hairline cracks in mow strip and minor dents and scrapes to MBGF and Single Guardrail Terminal (SGT) in multiple locations. Several of the wooden posts were damaged on the back side of the posts, behind the metal beam, and should be replaced. One SGT was damaged on the Northbound Mainlanes, just south of Park Street, and should be replaced as soon as practicable.

Coating:

The overall condition of the coatings on concrete rail and other coated surfaces was generally good. Some deficiencies noted include the presence of graffiti on some walls and splitter boxes in ponds and paint on SSTR has minor chips or scrapes throughout the project. Also, the CTRMA logo is rusting on most of the Phase I retaining walls. These deficiencies are aesthetic in nature and do not compromise safety of the traveling public.

Fencing:

Fencing throughout the project was found to be in good condition during the Fall 2015 inspection. The only deficiency noted was the fencing on the Northbound Mainlanes, just south of South Brushy Creek bridge, was knocked over in one section. This section should be removed or replaced.

Lighting:

The illumination elements were inspected for damage and proper functioning of the lights at night. The only item noted was that two of the illumination poles had minor damage to their base, which is not believed to pose a safety issue at this time.

Landscape Areas:

Landscaping areas, which are concentrated mainly at intersections between 183A and cross streets, were found to be in good condition during the Fall 2015 inspections. Some common deficiencies found include minor erosion in and around planting beds, minor damage to rock walls, trash and sediment accumulation, and washing out of decorative rocks in some areas.

Shared Use Path:

The Shared Use Path (SUP) runs along the west side of the southbound frontage road from Hero Way to RM 1431, where it crosses along the north side of RM 1431 and continues along the east side of 183A, to its termination at the Brushy Creek Regional Trail at South Brushy

Creek. During the Fall 2015 inspection, the SUP was found to be in very good condition with only minor wear and tear to the facility. The only major deficiency was just south of RM 2243, there is continuous flow of water from offsite across the path. This should be addressed.

Detention/Water Quality Ponds:

183A has numerous detention and water quality ponds along the length of the facility. These ponds serve to provide water quality treatment of the runoff from the roadway and detain the storm water where necessary. The most common issues noted were minor to severe erosion of some pond berms where water entered the pond, vegetative growth in sand filtration basins, trash buildup, and one outfall pipe not draining properly.



Observed Trash in Pond



Observed Vegetation in Sand Filter Basin

183A Phase I Project Warranty:

Many previously identified issues within the asphalt pavement sections were addressed with the repaving of the frontage roads in 2014. These issues were noted in previous reports and appeared to be the result of poor workmanship during the Phase I construction of 183A as well as normal wear and tear of the facility. Under the terms of the contract, the Developer was required to rectify a majority of the identified issues as part of their warranty obligations. Repairs associated with the 183A Phase I warranty items were completed in Fall 2014. Overall 183A continues to operate sufficiently on a daily basis, but is experiencing normal wear and tear that will require monitoring and maintenance to continue to serve as designed. With the completion of the repairs to the asphalt pavement the warranty period has ended and all warranty repairs have been made.

1.2 BRIDGES

All of the 183A bridges were last inspected and evaluated by TxDOT in October and December 2015, in accordance with the National Bridge Inspection Program (NBIP) which occurs every two years per federal requirements. The resulting reports were provided to the Mobility Authority and serve as the basis for the comments and recommendations for the Bridge portion of this report.



Northbound Mainlane Bridge at FM 1431

The existing bridge conditions were rated and are grouped by the following categories:

- **Deck** – condition of the deck surface, its associated joints, rail, sidewalks/medians, striping, and drainage on top of the bridge structure.
- **Substructure** – condition of columns, bents, abutments, foundations, and riprap.
- **Superstructure** – condition of concrete beams, beam connections and bearings.
- **Channel** – condition of the stream or creek being crossed by the bridge
- **Culverts** – condition of culvert and associated items
- **Approaches** – condition of the approach slabs, rail leading up to the bridge, guard fence, and retaining walls at the bridge abutments
- **Miscellaneous** – information about vertical under clearances
- **Traffic Safety** – description of approach rails and impact attenuators

A summary of the TxDOT bridge inspection reports for 183A is provided in the 183A Turnpike Detailed Inspection Report.

The pedestrian bridges were not inspected by TXDOT and were thus included in the GEC's annual inspection. There are four pedestrian bridges along the Shared Use Path adjacent to 183A. These bridges were found to be in good condition.

Based on a review of the most recent inspection reports and visual observations, 183A bridges, including those for the shared use path, remain in good condition. There are no significant deficiencies noted in the 2015 NBIP Reports. The most common deficiencies noted were hairline longitudinal and transverse cracks, worn joint sealant at bridge joints, and sediment build-up in bridge deck drains.

1.3 BUILDINGS

The inspection – which consists of general visual observations – revealed areas where the existing conditions of these facilities require attention.

For the purpose of this report, the existing building conditions are grouped by the following categories:



183A Turnpike Traffic Operations Center
(formerly called Field Operations Building)

1. Architectural

- a) **Building Exterior** – condition of walls, glazing, decks, stairs, handrails, sealants, soffits, doors, paint, and signage.
 - b) **Building Interior** – conditions of the lobby, finishes, stairs, doors, restrooms, security system, and ceiling tile.
 - c) **Roof** – condition of the surface condition, seams, expansion joints, and access.
 - d) **Drainage** – condition of the roof drains, secondary drainage, gutters, downspouts, and edge flashing.
 - e) **Site** – condition of the ramps, rails, lighting, retaining walls, screen walls, landscaping, irrigation, and parking.
2. **Structural** – condition of the foundation, ground floor slab, grade beams, walls, elevated floor slabs, roof, columns, and joints.
 3. **Mechanical** – condition of cooling and heating systems, air handlers, exhaust fans, ductwork, piping and insulation.
 - a) **Plumbing** – condition of the piping, water flow and pressure, hot water source, water pumps, natural gas plumbing, sanitary sewer plumbing, fixtures, and water softening system.
 - b) **Fire Protection Systems** and backflow preventers.
 4. **Electrical** – condition of the primary transformer, step-down transformer, electrical room, wiring, conduits, emergency power, and communication systems.

With the implementation of video-tolling, conversion to an all-electronic toll collection system (ETC) on 183A, future variable tolling, and the development of Incident Management and Operations Program, the Field Operations Building was transitioned into a Traffic Operations Center.

A summary of the Mobility Authority's building and plazas elements, together with their associated general condition, are described below. More detailed information on the facilities can be found in the 183A Detailed Inspection Report.

1.3.1. MAINLANE PLAZA AT PARK STREET

Traffic Operations Center (formerly called Field Operations Building) – Overall, the mainlane plaza facilities at Park Street generally are in very good condition. There were no significant deficiencies noted in the Fall 2015 inspections.

Toll Plaza and Access Walkway – There were no significant defects noted on the toll plaza or access walkway.

1.3.2. RAMP PLAZAS AT BRUSHY CREEK ROAD

The ramp plaza facilities are in overall good condition.

The toll booths at the Brushy Creek Road Ramp Plazas remain in place. With the conversion to a “cashless” all ETC toll collection system, the toll booth at each plaza has been deactivated, some non-essential equipment removed, and the toll booth has been secured. Efforts continue to potentially remove the booths; however, until the booths are removed, they should be protected and periodically inspected.

1.3.3. LAKELINE TOLL SYSTEMS EQUIPMENT (ILP) STRUCTURES

The Lakeline ILP Enclosure Structures on both the northbound and the southbound roadways are in overall good condition.

1.3.4. MAINLANE PLAZA AT CRYSTAL FALLS PARKWAY

Toll Plaza – There were no significant defects noted on the toll plaza.

ILP Enclosure Structures – The ILP Enclosure Structure on the northbound roadway is in overall good condition. There were no significant defects noted during inspection.

1.3.5. RAMP PLAZA TO SCOTTSDALE DRIVE

The Scottsdale Drive Ramp ILP Enclosure Structure is in overall good condition. No significant deficiencies were found.

1.3.6. RAMP PLAZAS NORTH OF CRYSTAL FALLS PKWY.

The Crystal Falls ILP Enclosure Structures on both the northbound and the southbound roadways are in overall good condition. There were no significant defects noted.

1.3.7. MAINTENANCE STORAGE YARD

The Maintenance Storage Yard at the Brushy Creek Road interchange provides a secured area for storage of various materials, including signs, lighting poles and fixtures, and other miscellaneous materials. The facility also stores a fully operational Anti-Icing Storage Tank and space for solid de-icing agents. This facility, together with the Traffic Operations Center, meets the immediate needs for storage of equipment and materials. The facility remains in generally good condition with adequate space for the orderly storage of materials.

As the Mobility Authority's Toll Road System and associated maintenance needs develop and expand, particularly with the implementation of additional toll road projects, planning has begun for a comprehensive Maintenance Program and associated facilities to best meet the Agency's future maintenance requirements. Construction has also begun on a new storage yard at the 290 East/Manor Expressway facility to provide additional storage and help meet anticipated upcoming storage needs.

1.4 TOLL COLLECTION SYSTEM

The basic components for the Toll Collection System (TCS) are the Toll Collection System Infrastructure, the Toll Collection System Operations and Maintenance, the Customer Service Center, and the Violation Processing Center. The TCS is fully interoperable with all Texas toll roads so that ETC customers from other cities, such as Houston and Dallas, can use the Mobility Authority's system and vice versa. Violation processing and collections, as well as the operation and maintenance of the toll collection systems, are provided through private contracts.

The Fall 2015 annual inspection performed by the GEC only included inspection of the Toll Infrastructure, as described in the section below. It does not include inspection of the tolling equipment itself. This equipment is inspected by a separate party.

1.4.1 TOLL COLLECTION SYSTEMS INFRASTRUCTURE

The toll system infrastructure required to accommodate the TCS consists of various components at each remote tolling location including, but not limited to:

- Special Reinforced Pavement Section;
- Retaining Walls and Copings;
- Drainage Features;
- Civil Site Work, including Grading, Access Driveways, and Fencing;
- Toll gantries, including foundations and gantry structures;
- ILP Equipment Enclosures, environmental protection and climate controls for housing the electronic equipment;
- Conduit and ground boxes providing connections between the ILP's and the ETC Lane equipment installations;
- Power and WAN communication services up to the location of the ILP enclosures;
- Emergency Generators and associated fuel tanks; and
- Signing, pavement markings, traffic barriers and other roadway appurtenances required at each remote tolling location.

The visual inspection of the toll system infrastructure indicates that the primary components remain in very good condition. Efforts should continue to keep all components clean, well maintained, and secure for the Toll Collection System.

1.5 RETAINING WALLS

The retaining walls on the project consist of mainly Mechanically Stabilized Earth (MSE) walls. There are also concrete noise walls adjacent to neighborhoods in the Phase I segment of 183A, a concrete block subdivision wall at the Block House Creek neighborhood, and soil nail and drilled shaft wall systems at the Scottsdale Drive underpass.

The Fall 2015 visual inspection did not identify any deficiencies that affect the safety and operations of the facility. The majority of the defects noted were minor cracking of panels, water stains on the face of the walls, cracked mow strip, and minor scratches and chips at the bottom of the walls, believed to be from mowing operations. However, there were a significant number of vertical cracks on the wall panels of soil nail walls 19 and 20, at the Scottsdale Drive bridges, which had white, brown, or black stains at the crack. These walls were visually observed by two structural engineers in 2014 and the consensus was that there seems to be water pressure behind these walls, possibly due to the drain pipe behind the wall being clogged. It is recommended that this drain be located and cleaned. The structural integrity of the walls is not believed to be compromised; however the walls should continue to be monitored.

2. RECOMMENDATIONS

Based on the findings of the annual visual inspections as well as the inventory and condition assessment, the current maintenance program that has been implemented is effective and should be continued to secure and maintain the overall condition of each asset. The continued efforts by the Mobility Authority contract maintenance personnel to maintain the roadways, bridges, roadside appurtenances, toll plazas, and building have kept the overall condition of the Mobility Authority assets in very good condition.

2.1 RECOMMENDATIONS FROM ANNUAL VISUAL INSPECTIONS

Based on the 2014 Fall annual visual inspections, it is recommended that the Mobility Authority continue to carry out an effective maintenance program, utilizing private contractors and partnerships with other local agencies, as necessary, to ensure that the 183A facility continues to be maintained in sound condition and good working order.

2.1.1. ROADWAYS

No major deficiencies were noted during the Fall 2015 visual inspection that would be detrimental to the safety and operations of the 183A facility. However, the following recommendations are noted for improvement of facility aesthetics or to prevent future issues.

- The Southbound Brushy Creek Loop, just south of the entrance ramp, is experiencing “alligator” cracking in an isolated location (see picture below). This is a sign of pavement failure and the pavement in the immediate area should be removed and replaced.
- Two potholes were identified in the concrete pavement of the southbound mainlanes and should be repaired in a timely manner. The first pothole is located just north of RM 1431 and the second can be found at the Brushy Creek Loop entrance ramp, just south of the toll gantry (see picture below).



Southbound Mainlanes
North of RM 1431



Southbound Brushy Creek Loop
Alligator Cracking

- There is large break with exposed rebar in the Single Slope Traffic Rail (SSTR), located on the northbound mainlane, just north of Avery Ranch (see picture below). Although this damage is more detrimental to the visual appeal rather than the functionality of the SSTR, the structure should be repaired as part of facility maintenance.
- There are large vertical cracks in the SSTR at all four corners of the Northbound Entrance Ramp Bridge, south of Avery Ranch (see picture below).



Northbound Mainlanes
North of Avery Ranch



Northbound Ramp
South of Avery Ranch

- Due to the recent repaving of the frontage roads, most pavement markings and graphics are new and in very good condition. Markings and graphics along old sections of asphalt pavement are in fair condition, with signs of cracking and fading. The markings along the concrete pavement are experiencing a significant amount of fading on the Phase I mainlanes. These areas should be restriped in the upcoming year. The Phase II mainlanes are in generally good condition, with some isolated areas of pavement marking cracking or fading.
- Many sections of MBGF and SSTR have broken or missing delineators throughout the project corridor. These should be replaced.
- The northbound bridge approach to Lakeline Blvd is uneven and it is recommended in the upcoming year or two that repairs be made to improve the transition from the roadway to the bridge.

- The outlet pipe from Bulldog Pond, under the south end of Blockhouse Creek Bridge, is not draining properly. Recommend re-grading from the pipe flowline to Blockhouse Creek to ensure positive drainage.
- The inlet pipe in the middle of Cougar Pond, North of Brushy Creek Road, is completely clogged. Recommend cleaning inlet.
- The Sand Filtration Basin of Badger Pond does not appear to be draining properly. The sand appears to be clogged with silt and sediment. Recommend removing and replacing the top few inches of sand to improve drainage.
- A portion of the berms for Bulldog Pond, Lobo Pond, and Aztec Pond were severely eroded and should be regraded and stabilized.

2.1.2. BRIDGES

Based on a review of the results of the October 2015 and December 2015 TxDOT bridge inspections, there are no significant deficiencies which require attention or repair. There are a few instances of scour at bridge piers, but it was determined they do not warrant additional attention. There were numerous bridge joints that were clogged with debris and sediment. These should be cleaned out.

2.1.3. BUILDINGS

The Traffic Operations Center (formerly Field Operations Building) and the mainlane Toll Plaza and Access Walkway facilities at Park Street are in generally good condition. Based on a review of the results of the buildings inspection, there are no recommendations at this time.

2.1.4. RETAINING WALLS

The Fall 2015 visual inspection did not identify any major deficiencies that affect the safety and operations of the facility. A few recommendations for retaining walls are as follows:

- There were a significant number of vertical cracks on the Walls 19 and 20 at Scottsdale Underpass, many with white, brown, or black stains at the crack. These walls were visually observed by two structural engineers in 2014 and the consensus was that there seems to be water pressure behind these walls, possibly due to the drain pipe behind the wall being clogged. It is recommended that this drain be located and cleaned. The structural integrity of the walls is not believed to be compromised; however the walls should continue to be monitored.
- There is an illumination fixture attached to the coping of Wall 20, just north of the Scottsdale Bridge, which is continuously leaking water. It is recommended that a solution should be developed and implemented that drains the water from behind the wall and illumination fixture.

Manor Expressway



INTRODUCTION

The Manor Expressway is a 6.2-mile limited access toll road developed and constructed by the Central Texas Regional Mobility Authority (Mobility Authority) to relieve congestion on US 290 East. The all-electronic toll collection corridor, consisting of three lanes in each direction, begins at US 183 and ends just east of Parmer Lane. The first phase of Manor Expressway, which consists of four tolled direct connectors at the US 183 interchange, opened in December 2012. The second phase of Manor Expressway opened to traffic in May 2014.

The 2016 annual report describes the inspection findings for the Manor Expressway.



Manor Expressway

Manor Expressway is a significant link to important roadways in the region including US 183, IH-35 and the SH 130 Toll Road and provides a critical evacuation route from the Gulf Coast.

In order for Manor Expressway to continue to serve as one of the region's most critical transportation corridors, the Mobility Authority must maintain a high level of performance for the expressway. The facility must remain in good working condition, such that the safety of users is ensured. Appropriate measures need to be taken to inspect the facility on a regular basis and plan maintenance and repair activities to prevent deterioration of the facility.

As per Section 712 of the Master Trust Indenture, the Mobility Authority shall require the General Engineering Consultant (GEC) to conduct an inspection of the "System", which is currently comprised of the 183A Turnpike and Manor Expressway, at least once in the fiscal year following substantial completion of the initial project funded with bond obligations and in each fiscal year thereafter.

Following each inspection and on or before the 90th day prior to the end of each fiscal year, the GEC shall submit to the Mobility Authority a report setting forth:

- Its findings as to whether the System has been maintained in good repair, working order, and condition;
- Its advice and recommendations as to the proper maintenance, repair, and operation of the System during the ensuing fiscal year; and
- An estimate of the amount of money necessary for such purposes, including its recommendations as to the total amounts and classifications of items and amounts that should be provided for in the annual operating budget, the annual maintenance budget, and annual capital budget for the next ensuing fiscal year.

Copies of such reports are to be provided to the Trustee by the Mobility Authority.



Eastbound Manor Expressway near Springdale Road

INSPECTION OF FACILITIES

In compliance with the requirements of the Master Trust Indenture, Atkins North America, Inc. conducted a visual inspection of Manor Expressway Project in December 2015. The inspection covered all portions of the facility including: pavement, roadside elements, retaining walls, underdeck lighting, drainage structures, signs and sign structures, pavement markings and associated buildings and equipment. Bridge inspections were conducted in early 2014 by the Texas Department of Transportation (TxDOT) as part of their Bridge Inventory, Inspection and Appraisal Program (BRINSAP). A summary of their findings will be included in this report.

This report is based on a general visual inspection and the opinions, statements, and recommendations are made with respect to the conditions revealed by this visual inspection. No representation or warranty is made that all defects have been discovered or that defects will

not appear in the future. A 1 to 10 inspection rating scale is used to determine the severity of the asset defect, shown in Table 1, below.

Table 1: Condition Assessment Rating Scale

Condition Assessment Rating Scale		
Grade	Rating	Description
10	Excellent	New construction-no problems noted. Feature is in like new condition.
9	Adequate	Very good condition-no problems noted
8		Good condition-some minor problems
7		Satisfactory condition-minor deterioration of elements functionality or serviceability. No maintenance is required.
6	Degraded	Fair condition-minor deterioration of elements. Maintenance is required.
5		Poor condition-deterioration affects functionality or serviceability. Maintenance is required to protect public or system.
4		Serious condition-deterioration seriously affects integrity of roadway or safety. Does not require emergency repair to protect public or system.
3	Unsatisfactory	Critical condition - repair is required to protect public or system as soon as practical.
2		Failing condition - emergency action necessary to protect public or system.
1	Replace	Failed condition-reconstruction required (out of service)

A rating of 7 or above indicates the asset is adequately performing or is in “like new” condition and does not require maintenance action.

A rating of 6 to 4 indicates some level of degradation of the asset performance and requires maintenance action but does not warrant expedited maintenance.

A rating from 3 to 2 indicates the defect identified is showing signs of the asset degrading to the point that it is no longer functional and requires expedited maintenance to protect the public or the system.

A rating of 1 indicates that the asset is out of service and is in need of replacement or reconstruction.

A Manor Expressway Detailed Inspection Report of the inspection findings is transmitted separately to the Mobility Authority's Director of Engineering.

ANNUAL REPORT OF CONDITIONS

This report includes conclusions and recommendations concerning the condition, maintenance, repair, and operation of Manor Expressway; the amount of money necessary for the proper maintenance, repair, and operation of the toll road during the ensuing Fiscal Year (2017); and the amount of funds available in the Renewal and Replacement Fund.

The results of this year’s annual inspection indicate that Manor Expressway is in satisfactory condition or better and is being maintained in an overall excellent condition. No deficiencies indicating unsatisfactory performance were identified. In general, most of the corrective measures are being addressed through the CTRMA System-wide Performance Based Maintenance Contract (PBMC). The project is reaching final acceptance, all punch list items have been completed. As part of the Comprehensive Development Agreement (CDA), a warranty provision is in place for various items, as summarized in Table 2, below.

Table 2: Manor Expressway Summary of Project Warranties

Summary of Project Warranties	
<i>General Subject</i>	<i>Warranty Period after FA</i>
Flexible Pavement: Pavement Failure in Surface/Base	5 years
Flexible Pavement: Cracking, Raveling, Flushing, Rutting, and Popouts	3 years
Rigid Pavement: Cracking, Joint Deficiencies, Punch-Outs, and Surface Defects	5 years
Buildings, Structures, Toll Structures, Gantries, and related facilities	5 years
Structural Concrete	5 years
Steel Paint System	5 years
Settlement: New Roadway Grade	5 years
Settlement: Noise and Retaining Walls	5 years
Signing (Permanent)	2 years
Traffic Signals	2 years
Turf Establishment	1 year
Lighting	2 years
D/B CDA Developer Directed Utilities Relocations	2 years

1. ANNUAL VISUAL INSPECTIONS

The annual visual inspection of the Mobility Authority’s Manor Expressway was completed in December 2015. The inspection was conducted to assess the general condition of roadways, buildings, overhead sign structures, retaining walls and toll gantries along the facility and to identify any deficient elements to be restored to good working condition. The assessment is based on general visual observations made in the field without conducting any detailed in-place testing. It should also be noted that the observations reflect the condition of the feature(s) on the day the inspection was performed. As such, the opinions, statements, and recommendations in this report are based solely on conditions observed during the inspection. As part of this inspection a list of roadside deficiencies is being provided to the Mobility Authority to forward to either the PBMC maintenance contractor or the construction contractor to be addressed.

1.1 ROADWAYS

The visual inspections consist of general visual observations to determine the physical and functional condition of a specific feature and to identify any deficiencies that may require attention.

For the purpose of this report, the existing roadway conditions were rated and grouped into three major categories: (1) Pavement; (2) Roadside; and (3) Miscellaneous. Each category consisted of specific features that were inspected, as shown in Table 3, below.

Table 3: Roadway Inspection Elements

Category	Item	Description of Inspection
Pavement	Pavement & shoulders	General conditions of pavement and shoulders
	Curb/Gutter	Deficiencies such as settlement, cracking, and displacement.
	Joints	Deficiencies including joint cracking, faulting, and surface deterioration etc.
Roadside	Culverts	Inadequate drainage at culverts, flumes, and weep holes
	Ditches	Erosion, silting, presence of debris, lack of vegetation etc.
	Grates/Inlets/Piping	Inadequate drainage at pipes, grates and inlets
Miscellaneous	Signs	Conditions associated with mainlane and ramp signing to include damage and day and night visibility
	Pavement Graphics	Condition of pavement graphics to include day and night visibility and section loss
	Pavement Markings	Wear and tear of striping and markings to included day and night visibility and section loss
	Raised Pavement Markers	Condition of raised pavement markers to include missing and proper day and night visibility
	Delineators	Condition of delineation to include missing and proper day and night visibility
	MBGF	Condition of metal beam guard fence (MBGF) and its components, terminal anchors, single guardrail terminals (SGT) etc.
	Attenuators	Condition of various crash attenuation systems
	Barriers	Condition of concrete barriers and bridge rail
Coatings	Conditions such as peeling, absent, or damaged coatings on concrete traffic barrier, concrete traffic rail, or other coated surfaces.	

Category	Item	Description of Inspection
	Fence	Condition of chain-link, barbed wire, and ornamental fencing at the right-of-way (ROW), or within maintenance limits.
	Lighting	Conditions associated with lighting structures and its components and bridge underdeck lights as well as night time inspections for proper operation.

As previously noted, the results of this year’s annual inspection indicate that Manor Expressway is in like new condition and is being maintained in an overall excellent condition. A summary of the visual findings within each category are provided below.

Pavement

The concrete pavement sections along the corridor appear to be in good condition with no apparent unsatisfactory deficiencies. In addition, no deficiencies were identified in the joints or curb and gutter along the corridor.

Roadside

The roadside visual inspection did not identify any unsatisfactory deficiencies that affect the safety and operations of the facility. In general, most roadside features are newly constructed or are in adequate or better condition. Only a few elements were identified as minor problems, with the most common deficiency being minor erosion and small areas where vegetation is sparse.

Miscellaneous

Pavement striping and symbols are showing signs of deterioration through lack of reflectivity and section loss. Reflective pavement markers are in need of maintenance to replace missing or non-reflective markers.

1.2 BRIDGES

All bridges constructed on the Manor Expressway project, with the exception of the pedestrian bridge, were inspected and evaluated late 2015, as part of TxDOT’s Bridge Inventory, Inspection and Appraisal Program (BRINSAP). BRINSAP is TxDOT’s program to implement the National Bridge Inspection Standards (NBIS) which are issued by the Federal Highway Administration (FHWA) discussed in detail in Code of Federal Regulations, 23 CFR 650C. These standards require the bridges to be inventoried, inspected and appraised every two years in accordance with the Manual of Maintenance Inspection of Bridges published by the American Association of State Highway and Transportation Officials (AASHTO). TxDOT inspects the bridges on Manor Expressway as part of their On-System bridge inventory. This inventory applies to any bridge on the Commission-designated State Highway System. The resulting reports were provided to the Mobility Authority and mostly serve as the basis for the comments and recommendations for the bridge portion of the report.



Manor Expressway Mainlane Bridges over SH 130 Mainlanes and Frontage Roads

The existing bridge conditions were rated and are grouped by the following categories:

- Deck – condition of the deck surface, its associated joints, rail, sidewalks/medians, striping, and drainage on top of the bridge structure.
- Substructure – condition of columns, bents, abutments, foundations, and riprap.
- Superstructure – condition of concrete beams, beam connections and bearings.
- Coating – peeling or absent coating on railing, substructure, slope protection, or beam surfaces.
- Erosion – deficiencies caused by runoff such as erosion along abutment slopes.
- Riprap – condition of riprap structures and their associated joints, including concrete slope protection, flumes, and abutment slopes.
- Drainage – conditions associated with inadequate drainage at abutment slopes, inlets, pipes, grates, flumes, and weepholes.

A summary of the bridge inspection reports for Manor Expressway is provided in the Manor Expressway Detailed Inspection Report.

It should be noted that during the December 2015 inspection, uneven transitions from the roadway section to the bridge section of multiple bridges were observed. The Design-Build Contractor has been notified of these deficiencies pursuant to the warranty terms of the design-build contract. The Mobility Authority has requested the Design-Build Contractor to develop a corrective action plan to address these uneven transitions.

The pedestrian bridge was inspected by Atkins North America, Inc. in December 2015 with no significant deterioration noted.

Based on a review of the most recent inspection reports and visual observations, Manor Expressway bridges are in adequate or better condition.

1.3 BUILDINGS

The inspection of building facilities serving the Manor Expressway project revealed areas where the existing conditions of these facilities require maintenance actions. The inspections covered three In-Lane Processor (ILP) buildings, which house various electronic toll collection equipment, located at the westbound and eastbound tolling locations at the east ends of the direct connect flyovers, and at the Parmer mainlane tolling location. An emergency generator site that serves both the westbound and eastbound tolling location is located on the north side of the westbound frontage road, just west of Cross Park Drive. The Parmer emergency generator is located adjacent to the Parmer ILP building.



ILP building located at the Parmer Mainlane tolling location

For the purpose of this report, the existing building conditions for the ILP buildings are grouped in the categories described in Table 4, below.

Table 4: Building Inspection Elements

Element	Description of Inspection
Building Exterior	Condition of wall system, sealants, paint, glazing, and doors
Roofing	Surface condition, seams, expansion joints, and access
Building Interior	Conditions of finishes, windows, doors, security system, and paint

Element	Description of Inspection
Site Improvements	Conditions of the sidewalks, ramps/rails, building-mounted and pole-mounted lighting, fences, site drainage, drainage structures, and parking.
Structure	Condition of the general construction job, foundation, ground floor slab, roof structure, expansion joints
Electrical	Condition of the electrical room, wiring/conduit, emergency generator, primary lighting, Ground Fault Circuit Interrupters (GFCI), power provider/reported adequacy, and Uninterruptible Power Supply (UPS)
Mechanical Systems	Condition of cooling and heating systems, air handlers, outside air provision, exhaust fans, ductwork/insulation, reported capacity adequacy
Fire Protection	Condition of cooling and alarm system, smoke detectors and heat detectors



Emergency generator that serves the Eastbound Entrance Ramp toll location East of Johnny Morris Rd

A summary of the Mobility Authority’s ILP buildings and the associated general conditions are described in the Manor Expressway Inspection Report. Overall, the ILP building facilities on Manor Expressway are in adequate or better condition. The following is a general summary of condition assessment for each category.

- **Building Exterior**
No unsatisfactory deficiencies were observed on the exterior finishes or surfaces.

- **Roofing**
The surface, seams, expansion joints and roof at both ILP building locations are in good condition.
- **Building Interior**
No unsatisfactory deficiencies were observed on the interior finishes or surfaces. Ceiling tile joints need minor repair. This work is cosmetic in nature.
- **Site Improvements**
Minor cracking in the parking lots at the SEDC location was noted during inspection. Evidence of water ponding over electrical ground boxes was also noted at the SEDC location. These issues were rated as degraded, requiring routine maintenance to address the deficiency.
- **Structure**
No deficiencies were observed in the structural components of ILP buildings.
- **Electrical Systems**
The electrical systems appear to be in adequate or better condition.
- **Mechanical Systems**
The mechanical systems at both ILP buildings are in good working order with no deficiencies requiring maintenance.
- **Fire Protection**
The "POWER ON" indicator was not lit on several smoke detectors, indicating that they may not be functioning properly. Fire suppression systems will be inspected by a licensed professional as there are no panels available to check the status of the system.

1.4 TOLL COLLECTION SYSTEM

The basic components for the Toll Collection System (TCS) are the TCS Infrastructure, the TCS Operations and Maintenance, the Customer Service Center (CSC), and the Violation Processing Center (VPC).

Manor Expressway uses a computerized all-electronic toll collection system similar in make-up and functionality to those used on other toll roads in Texas, including electronic toll collection (ETC) using automatic vehicle identification and classification technology, a Violation Enforcement System (VES) with an integrated camera and triggering system to capture referenced digital images of license plates of those vehicles that are "Pay-By-Mail". License plates on these vehicles are captured by cameras, and the registered vehicle owner is sent a bill for the toll, plus an administration fee.

The TCS is fully interoperable with all Texas toll roads so that ETC customers from other cities, such as Houston and Dallas, can use the Mobility Authority's system and vice versa. Violation processing and collections, as well as the operation and maintenance of the toll collection systems, are provided through vendors that support the Mobility Authority.

The entire TCS is operated and maintained under a separate Maintenance Contract by the Mobility Authority's Systems Integrator, Schneider Electric, formerly known as Telvent USA Corporation. The TCS is equipped with a Remote On-Line Management System (ROMS) that monitors all elements, and Schneider Electric provides a staff of engineers and technicians available at all times to ensure the TCS remains fully functional.

The Mobility Authority contracts with the members of the Texas Statewide Interoperability Task force for CSC services for its customers. The local CSC facility, developed and administrated by the Tolls Operation Division (TOD) of TxDOT, is located at 12719 Burnet Road, Austin, Texas.

The VPC is located in a separate facility at 8325 Tuscan Way, Austin, Texas, and it is being administered by the Municipal Services Bureau, Inc. under contract to the Mobility Authority.

1.4.1. TOLL COLLECTION SYSTEMS INFRASTRUCTURE

The toll system infrastructure required to accommodate the TCS consists of various components at each remote tolling location including, but not limited to:

- Special Reinforced Pavement Section;
- Retaining Walls and Copings;
- Drainage Features;
- Civil Site Work, including Grading, Access Driveways, and Fencing;
- Toll gantries, including foundations and gantry structures;
- ILP Equipment Enclosures, environmental protection and climate controls for housing the electronic equipment;
- Conduit and ground boxes providing connections between the ILP's and the ETC Lane equipment installations;
- Power and Wide Area Network (WAN) communication services up to the location of the ILP enclosures;
- Emergency Generators and associated fuel tanks; and
- Signing, pavement markings, traffic barriers and other roadway appurtenances required at each remote tolling location.

As discussed in Section 1.4 (Buildings), the visual inspection of the building and civil site aspects of the toll system infrastructure indicates that the primary components are in adequate or better condition. In addition, as discussed in Section 1.5 (Overhead Sign Bridges), the toll gantries are in adequate or better condition. Other elements associated with the toll infrastructure listed above were found to be in adequate or better condition. Efforts should continue to keep all components clean, well maintained, and secure for the Toll Collection System.

1.5 RETAINING WALLS

To ensure the health of the system, both new and existing retaining walls along Manor Expressway were inspected and evaluated. The various components of retaining walls were rated and grouped in categories described in Table 5, below.

Table 5: Retaining Wall Inspection Components

Item	Description of Inspection
Wall	Condition of wall face, coping, foundations, joints, panel finishes and Cast in Place (CIP) sections.
Earth	Conditions of the top slope, toe slope, backfill, CIP, and Mechanically Stabilized Earth (MSE) wall.

A summary of the retaining wall inspection reports are provided in the Manor Expressway Project Detailed Inspection Report.



Retaining Wall S1-05 at the Southwest Corner of the Springdale Rd Intersection

Based on visual observations, both new and existing retaining walls on the Manor Expressway project are in adequate or better condition with minor cosmetic deficiencies.

1.6 OVERHEAD SIGN BRIDGES

Overhead sign bridges, which include toll gantries, sign structures, and monotube sign structures were visually inspected for deficiencies associated with their foundations, anchor bolts, base plates, column supports and arm chord connections and members.



Overhead sign structure westbound approaching Johnny Morris Rd

The inspection did not reveal any unsatisfactory deficiencies in the condition and operation of the toll gantries and sign structures. Deficiencies requiring maintenance include members of a column support beginning to reveal rust stains from the presence of an iron ore aggregate which can occur naturally in the concrete coarse aggregate known as marcasite. These rust stains are limited to an aesthetic concern and are easily repaired by removing the particular piece of aggregate, patching the hole and repainting.

2. RECOMMENDATIONS

Based on the findings of the annual visual inspections as well as the inventory and condition assessment, the current maintenance program that has been implemented should be continued to effectively secure and maintain the overall condition of each asset. The continued efforts by the Mobility Authority to maintain the roadways, bridges, roadside appurtenances, toll plazas, and building have kept the overall condition of the Mobility Authority assets in adequate or better condition.

The Mobility Authority is mandated by State Law, as well as by the terms of the Trust Indenture, to maintain a safe highway facility in sound condition and good working order. An effective maintenance policy contributes significantly to ensuring a safe highway for system users, as well as preserving the investment.

The Mobility Authority is currently utilizing a System-wide Performance Based Maintenance Contract (PBMC) to perform routine maintenance services. The intent of the PBMC is for the Contractor to manage and plan maintenance activities to meet the performance requirements as set forth in the contract documents. This contract is being administered by the Mobility Authority with all elements being audited on a minimum monthly basis for contract compliance.

2.1 RECOMMENDATIONS FROM ANNUAL VISUAL INSPECTIONS

Based on the 2015 annual visual inspections, it is recommended that the Mobility Authority continue to carry out an effective maintenance program to ensure that the Manor Expressway facility continues to be maintained in sound condition and good working order.

2.1.1. ROADWAYS

No unsatisfactory pavement or roadside deficiencies were identified during the 2015 visual inspection period that would negatively affect current safety and operations of the facility. Based on the 2015 visual inspection, the concrete pavement sections of Manor Expressway are in good condition with no apparent unsatisfactory deficiencies. No maintenance repairs on the pavement are necessary or recommended at this time but should continue to be monitored.

Pavement markings and graphics are showing significant signs of wear and warrant replacement. Raised pavement markings are in need of maintenance, as well. This work is part of the PBMC scope and will be scheduled accordingly.

The Mobility Authority has taken steps to develop a pavement management system to improve the effectiveness of the funds used to maintain their pavement network and to ensure that bond covenants are met. The development of the pavement management system utilizes the PAVER software, which utilizes inspection data and pavement condition scoring to develop performance models for forecasting future renewal and replacement needs. Continued implementation of a pavement management system as part of an annual asset inspection and assessment is recommended and would allow the Mobility Authority to proactively monitor the condition of its pavements and demonstrate the optimal timing for funding.

2.1.2. BRIDGES

Based on a review of the results of the bridge inspections, uneven transitions from the roadway section to the bridge section of several bridges were observed. The Mobility Authority is pursuing corrective actions through the warranty provisions of the design-build contract.

2.1.3. BUILDINGS

The 2015 annual inspection revealed that the three ILP buildings on Manor Expressway are in adequate or better condition with only minor deficiencies identified.

2.1.4. RETAINING WALLS

Based on visual observations, both new and existing retaining walls on the Manor Expressway project are in adequate or better condition. Deficiencies observed were minor and mostly aesthetic in nature.

2.1.5. TOLL COLLECTION SYSTEM

Of the items inspected, the results did not reveal any unsatisfactory deficiencies in the condition and operation of the toll collection system infrastructure.

2.1.6. OVERHEAD SIGN BRIDGES

The inspection did not reveal any unsatisfactory deficiencies in the condition and operation of the toll gantries and sign structures. The rust stains cause by the presence of marcasite in the concrete large aggregate are limited to an aesthetic concern. The repair is to remove the particular piece of aggregate, patch the hole and repaint.

On-Going Initiatives



1. ON-GOING INITIATIVES

1.1 Pavement Management:

All in all, the minor deficiencies identified during the annual inspection should be monitored to ensure that more serious conditions do not develop. As traffic volumes increase, continued attention and maintenance on 183A Turnpike and Manor Expressway is essential to ensure proper operation. The following preventative maintenance programs would be an effective complement to the Agency's pavement management plan to aid in proactively monitoring the condition of the pavement.

1.2 Preventative Maintenance Programs:

- i. **Ride Quality Testing** – International Roughness Index (IRI) testing and straight edge testing is recommended to be performed on an annual basis to determine ride quality. Ride quality is important for several reasons. Studies have found that the traveling public considers pavement conditions, which includes ride quality, to be third most important improvement needed for highways, behind only traffic flow and safety.

Smoother roads last longer. Rougher pavements result in more dynamic loading, subjecting pavements to much heavier loads than they were designed for, wearing them out faster. While there are many other factors that affect pavement life, evidence has shown that smoother roads last longer.

Smoother roads are safer. Rough roads can result in a loss of vehicle control, a reduction in a person's ability to perform motor tasks, driver fatigue, and an increased frequency of lost load accidents. Additionally, when considering the effect of roughness on pavement friction, increased roughness results in higher average friction loss.

Finally, smoother roads save both the user and the owner-agency money. Studies have found that pavements build smoother initially, require less maintenance over the life of the pavement. Additionally, studies have shown that smoother pavements decrease both fuel consumption and vehicle maintenance, which is a savings for roadway users.

- ii. **Skid Testing** – Since 183A Phase II Extension and Manor Expressway remain in like-new conditions, skid testing is not warranted at this time. As the facility ages, skid testing is recommended to be performed on a bi-annual cycle. It is recommended that skid testing be performed on the original 183A Turnpike pavement sections in the relatively near term. In the meantime, the facility should continue to be monitored for any wet-weather safety issues. The most common method of evaluation reported by state DOTs was the locked-wheel skid test following ASTM (American Society for Testing and Materials) E274. Using ASTM E274 specifications, states described skid numbers (SNs) of 30 and above as acceptable for low-volume roads and 35-38 as acceptable for heavily traveled roads.
- iii. **Joint and Crack Sealing** – Routine joint and crack sealing will be covered as part of the Performance Based Maintenance Contract. The Maintenance Contractor is required to fill cracks on a routine basis to help preserve the life of the pavement.

Budget



1. ANNUAL BUDGETS

Annual budgets are currently being prepared by the Mobility Authority for the proper maintenance, repair, and operation of the System (183A Turnpike and the Manor Expressway) for the Fiscal Year (FY) 2017. These budgets, which are based on estimated cost projections, together with the factors that may influence costs during this period, will be reviewed by the GEC's as they are made available from the Mobility Authority. These budgets should take into account the recommended maintenance and repairs noted in the current 183A Turnpike and Manor Expressway Annual Report of Conditions and Detailed Inspection Reports; and they should be based on current operating practices and agency organization, anticipated changes in methods of operations, and changes in Mobility Authority staff and organization projected through FY 2017. The budgets shown below do not include non-system costs.

1.1 ANNUAL OPERATING BUDGET

The operations costs consist of administration costs, including: accounting, financial and legal expenses, toll collection and toll system maintenance, customer service, violation processing, banking services, policing, and other costs associated with the operations of the 183A Turnpike and the Manor Expressway. The estimated costs for the proper operation of these facilities for the coming fiscal year is based on a review of existing and future conditions, together with the factors that may influence costs during this period. The GECs estimate the FY 2017 System Operating Expenses to be \$11,200,000. The factors that determine the amount include the utilization of consultants/vendors and the assignment of Mobility Authority personnel. The actual Annual Operating Budget will be finalized by the Mobility Authority on or before June 30, 2016.

It is our opinion that the costs projected for the operation of the 183A Turnpike and the Manor Expressway are reasonable estimations of anticipated costs for the FY 2017 Annual Operating Budget.

1.2 ANNUAL MAINTENANCE BUDGET

The maintenance costs include administration costs, roadway contract maintenance activities, and other costs associated with the maintenance of the 183A Turnpike and Manor Expressway. The estimated costs for the proper maintenance and repair of these facilities for the coming year is based on a review of existing and future conditions, together with the factors that may influence costs during this period. The GECs estimate the FY 2017 Maintenance Expenses to be \$3,400,000. The increase in the maintenance budget over last year's budget is reflective of the new maintenance contract that started January 1, 2016. This estimated budget does not include the amount that TxDOT will be reimbursing the Mobility Authority for maintenance of TxDOT's portion of the Manor Expressway Project. The actual Annual Maintenance Budget will be finalized by the Mobility Authority on or before June 30, 2016.

It is our opinion that the costs projected for the maintenance of the 183A Turnpike and Manor Expressway are reasonable estimations of anticipated costs for the FY 2017 Annual Maintenance Budget.

1.3 ANNUAL CAPITAL BUDGET

The Annual Capital Budget details the Mobility Authority's planned capital expenditures during the ensuing Fiscal Year and the portion of capital expenditures expected to be funded from the Renewal and Replacement Fund. As defined by the Master Trust Indenture, the Annual Capital Budget for each Fiscal Year includes: the expected beginning balance in the Renewal and Replacement Fund; the amounts to be transferred by the Trustee to the Renewal and Replacement Fund from the Revenue Fund; the amount of proceeds of Obligations expected to become available during the Fiscal Year; and the desired year-end balance in the Renewal and Replacement Fund. At a minimum, the Annual Capital Budget should be in the amount recommended by the General Engineering Consultants.

The Mobility Authority has begun design of the Southbound SH 130 to Westbound Manor Expressway direct connector (DC). The design for this DC is expected to be complete within FY 2017 for an estimated fee of \$3,500,000. If funding becomes available, the Mobility Authority will authorize design and construction of two additional direct connectors at this interchange: Northbound SH 130 to Westbound Manor Expressway and Eastbound Manor Expressway to Southbound SH 130. The design for these DCs is estimated to be approximately \$6,300,000.

Currently, Capital Budget expenditures in FY 2017 are estimated between \$3,500,000 and \$9,800,000 for design of the Manor Expressway/SH 130 Interchange Project on Manor Expressway. There are no anticipated Capital Budget expenditures for the 183A Turnpike. The actual Annual Capital Budget will be finalized by the Mobility Authority on or before June 30, 2016.

2. RENEWAL AND REPLACEMENT FUND

The Renewal and Replacement Fund was established under the terms of the Master Trust Indenture for the purpose of paying the cost of:

- i. unusual or extraordinary maintenance or repairs not occurring annually, and renewals and replacements, including major items of equipment;
- ii. repairs or replacements resulting from an emergency caused by some extraordinary occurrence, so characterized by a certificate signed by an Authorized Representative, approved by the Consulting Engineer and filed with the Trustee stating that the moneys in the Reserve Fund and insurance proceeds, if any, available therefore are insufficient to meet such emergency; and,
- iii. paying all or any part of the cost of any capital improvements to the System.

To finance the future needs for repair, replacement, and rehabilitation work required on the 183A Turnpike and the Manor Expressway, the cumulative amount in the Renewal and Replacement Fund should be sufficient to finance the next anticipated Renewal and Replacement Activities. Renewal and Replacement for 183A Turnpike is projected to be approximately \$1,950,000 and tentatively scheduled to occur in 2020. Renewal and Replacement for Manor Expressway is projected to be approximately \$980,000 and tentatively scheduled to occur in 2022.

The Mobility Authority executed a new Performance Based Maintenance Contract in 2016, which covers certain activities that would have been covered by the Renewal and Replacement Fund in previous years, such as striping and pavement marking replacement. In addition, it was originally anticipated that the guide signs on 183A Phase I would need to be replaced in FY 2017. However, due to improvements in sign materials, the signs are lasting longer than predicted and do not need to be replaced this year.