



CENTRAL TEXAS REGIONAL
MOBILITY AUTHORITY

2020 ANNUAL REPORT OF CONDITIONS



Prepared by:

ATKINS

Member of the SNC-Lavalin Group

General Engineering Consultant



CENTRAL TEXAS REGIONAL MOBILITY AUTHORITY SYSTEM



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March 24, 2020

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Subject: **2020 Annual Report of Conditions – 183A Turnpike, 290E, SH 71 Express, SH 45 Southwest, and 183 South Interim Build Roadways**

Mr. Heiligenstein:

As General Engineering Consultant to the Central Texas Regional Mobility Authority (Mobility Authority) and in accordance with Section 712 of the Master Trust Indenture, Atkins North America, Inc. (Atkins) is pleased to submit the 2020 Annual Report of Conditions for the 183A Turnpike, 290E, SH 71 Express, SH 45 Southwest, and the 183 South Interim Build roadways. This report sets forth our findings as to the condition of these facilities, as well as our recommendation of proper operations and maintenance of the facilities during fiscal year 2020.

Atkins conducted a visual inspection of all portions of the 183A Turnpike, 290E, SH 71 Express, SH 45 Southwest, and the 183 South Interim Build in fall 2019. 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). The findings of the most recent NBIP inspections, conducted in 2019, were reviewed and are reflected in this report. The 183 South Interim Build, which begins south of the existing interchange with US 290 and ends at the Boggy Creek bridge, opened to traffic in 2019. The Ultimate configuration is anticipated to open to traffic in late 2020. The Ultimate project configuration for the 183 South Project was not in operation at the time of inspections, although expenses for operations and maintenance will be included in the recommended budgets for Fiscal Year 2021.

The following report summarizes the conditions observed and are fully reported in the 2020 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 Consultant(s), and we wish to acknowledge the excellent cooperation of the Mobility Authority staff in the performance of these services.

Sincerely,

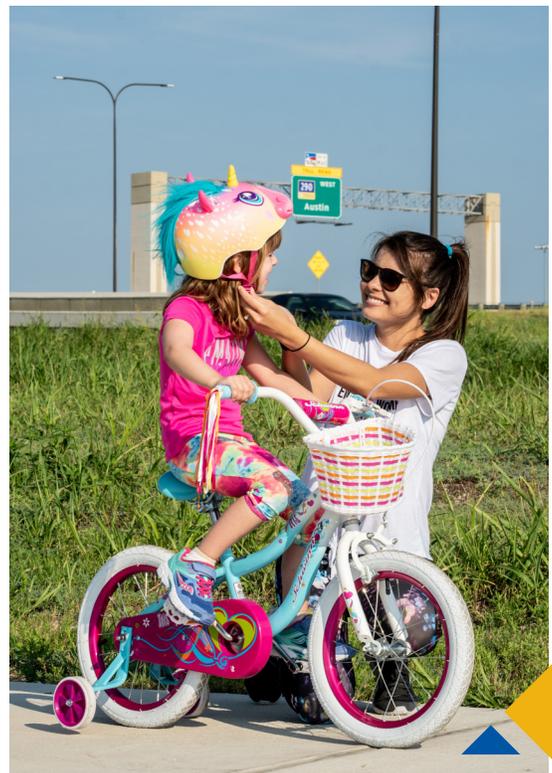
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Enclosure

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▶ Table of Contents

ACRONYMS AND ABBREVIATIONS	3
SYSTEM MAP	4
EXECUTIVE SUMMARY	5
1.0 INTRODUCTION	6
1.1 BACKGROUND.....	6
1.2 INSPECTION PROCESS.....	6
1.3 DESCRIPTION OF SYSTEM.....	10
1.3.1. 183A TURNPIKE.....	10
1.3.2. 290E.....	10
1.3.3. SH 71 EXPRESS.....	10
1.3.4. SH 45 SOUTHWEST.....	10
1.3.5. 183 SOUTH INTERIM BUILD.....	11
1.3.6. FACILITIES/BUILDINGS.....	11
1.4 MAINTENANCE PROGRAM OVERVIEW.....	11
1.5 CONDITION ASSESSMENT.....	12
2.0 ANNUAL REPORT OF CONDITIONS	12
2.1 OVERVIEW.....	12
2.2 183A TURNPIKE.....	12
2.2.1. 183A TURNPIKE ROADWAY.....	12
2.2.2. 183A TURNPIKE BRIDGES.....	13
2.2.3. 183A TURNPIKE RETAINING WALLS.....	14
2.2.4. 183A TURNPIKE BUILDING FACILITIES.....	14
2.2.5. 183A TURNPIKE MAINTENANCE STORAGE YARD.....	15
2.2.6. 183A TURNPIKE OVERHEAD SIGN BRIDGES.....	15
2.2.7. 183A TURNPIKE TOLL COLLECTION SYSTEM.....	15
2.3 290E.....	16
2.3.1. 290E ROADWAY.....	16
2.3.2. 290E BRIDGES.....	17
2.3.3. 290E RETAINING WALLS.....	17
2.3.4. 290E MAINTENANCE STORAGE YARDS.....	17
2.3.5. 290E OVERHEAD SIGN BRIDGES.....	18
2.3.6. 290E TOLL COLLECTION SYSTEM.....	18
2.4 SH 71 EXPRESS.....	19
2.4.1. SH 71 EXPRESS ROADWAY.....	22
2.4.2. SH 71 EXPRESS BRIDGES.....	23
2.4.3. SH 71 EXPRESS RETAINING WALLS.....	23
2.4.4. SH 71 EXPRESS OVERHEAD SIGN BRIDGES.....	23
2.4.5. SH 71 EXPRESS TOLL COLLECTION SYSTEM.....	23
2.5 SH 45 SOUTHWEST.....	24
2.5.1. SH 45 SOUTHWEST ROADWAY.....	24
2.5.2. SH 45 SOUTHWEST BRIDGES.....	24
2.5.3. SH 45 SOUTHWEST RETAINING WALLS.....	25
2.5.4. SH 45 SOUTHWEST OVERHEAD SIGN BRIDGES.....	25
2.5.5. SH 45 SOUTHWEST TOLL COLLECTION SYSTEM.....	25
2.6 183 SOUTH INTERIM BUILD.....	25
2.6.1. 183 SOUTH INTERIM BUILD ROADWAY.....	25
2.6.2. 183 SOUTH INTERIM BUILD BRIDGES.....	25
2.6.3. 183 SOUTH INTERIM BUILD RETAINING WALLS.....	26
2.6.4. 183 SOUTH INTERIM BUILD OVERHEAD SIGN BRIDGES.....	26
2.6.5. 183 SOUTH INTERIM BUILD TOLL COLLECTION SYSTEM.....	26
3.0 ONGOING INITIATIVES	26
3.1 ASSET MANAGEMENT.....	26
3.2 QUARTERLY SAFETY COMMITTEE MEETINGS.....	26
3.3 TECHNOLOGY INITIATIVES.....	27
3.3.1. INTELLIGENT TRAFFIC SYSTEMS (ITS) MASTER PLAN.....	27
3.3.2. ITS RETROFITS AND EXPANSIONS.....	27
3.3.3. REGIONAL TECHNOLOGY CORRIDOR STRATEGY.....	27
4.0 ANNUAL BUDGETS	28
4.1 ANNUAL OPERATING BUDGET.....	28
4.2 ANNUAL MAINTENANCE BUDGET.....	28
4.3 ANNUAL CAPITAL BUDGET.....	29
5.0 RENEWAL AND REPLACEMENT FUND	29
6.0 RECOMMENDATIONS	30
6.1 OVERVIEW.....	30
6.2 183A TURNPIKE RECOMMENDATIONS.....	30
6.3 290E RECOMMENDATIONS.....	31
6.4 SH 71 EXPRESS RECOMMENDATIONS.....	31
6.5 SH 45 SOUTHWEST RECOMMENDATIONS.....	32
6.6 183 SOUTH INTERIM BUILD RECOMMENDATIONS.....	32



▶ Acronyms and Abbreviations

ACRONYMS AND ABBREVIATIONS	
AASHTO	American Association of State Highway and Transportation Officials
ASTM	American Society for Testing and Materials
BRINSAP	Bridge Inventory, Inspection and Appraisal Program
CAMPO	Capital Area Metropolitan Planning Organization
CDA	Comprehensive Development Agreement
CFR	Code of Federal Regulations
CIP	Cast in Place
CR	County Road
D/B	Design-Build
DC	Direct Connector
ETC	Electronic Toll Collection
FHWA	Federal Highway Administration
FA	Final Acceptance
FY	Fiscal Year
GEC	General Engineering Consultant
GIS	Geographic Information System
IH	Interstate Highway
ILP	In-Lane Processing
IRI	International Roughness Index
LP	Liquified Petroleum
MBGF	Metal Beam Guard Fence
MMP	Maintenance Management Plan
MSE	Mechanically Stabilized Earth
MUTCD	Manual on Uniform Traffic Control Devices
NBIP	National Bridge Inspection Program
NBIS	National Bridge Inspection Standards
NEPA	National Environmental Policy Act of 1969
NFPA	National Fire Protection Association
PBMC	Performance Based Maintenance Contractor
RM	Ranch to Market Road
ROW	Right-of-Way
SGT	Single Guardrail Terminal
SH	State Highway
TAMP	Transportation Asset Management Plan
TCS	Toll Collection System
TIM	Traffic Incident & Management Center
TxDOT	Texas Department of Transportation
TTC	Texas Transportation Commission
US	United States Highway
WAN	Wide Area Network

System Map



Executive Summary

As per Section 712 of the Master Trust Indenture, the Central Texas Regional Mobility Authority (Mobility Authority) shall require the General Engineering Consultant (GEC) to conduct an inspection of the "System" at least once in the fiscal year following substantial completion of the initial project funded with bond obligations, and in each fiscal year thereafter. The System is currently comprised of the 183A Turnpike, 290E, SH 71 Express, SH 45 Southwest, and the 183 South Interim Build roadways.

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.

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

Copies of such reports are to be provided to the Trustee by the Mobility Authority. Atkins North America, Inc. (Atkins), as GEC, completed the inspections in fall 2019 and is pleased to report that the System has been maintained in good repair, working order and condition. This observation was based on a general visual inspection of the roadways, buildings, overhead sign bridges, retaining walls and toll gantries.

Atkins recommends that the Mobility Authority continue to implement the routine maintenance as budgeted and scoped, and also implement the Renewal and Replacement Projects planned for the ensuing fiscal year. Through coordination with Mobility Authority staff, and in review of the anticipated Renewal and Replacement Projects anticipated through 2025, the following budgets are recommended:

RECOMMENDED BUDGETS

Operating Expenses	\$27,200,000
Maintenance Expenses	\$10,900,000
Renewal and Replacement Fund 2021	\$8,800,000

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

▶ 1.0 Introduction

1.1 BACKGROUND

In compliance with the requirements of the Master Trust Indenture, Atkins conducted a visual inspection of the 183A Turnpike, 290E, SH 71 Express, SH 45 Southwest, and the 183S Interim Build roadways in fall 2019. The inspection was conducted to assess the general condition of roadways, buildings, overhead sign bridges, retaining walls and toll gantries along the facilities and to identify any deficient elements to be restored to good working condition. This report includes conclusions and recommendations concerning the condition, maintenance, repair and operation; the amount of money necessary for the proper maintenance, repair and operation of the toll roads during the ensuing Fiscal Year (2021), and the amount of funds available in the Renewal and Replacement Fund. Although the Full Build of the 183 South Project is not currently in operation, expenses for operations and maintenance will be included in the recommended budgets for Fiscal Year 2021.

1.2 INSPECTION PROCESS

The inspection covered all portions of the facilities including: pavement, roadside elements, retaining and noise walls, underdeck lighting, drainage structures, signs and sign bridges, pavement markings and associated buildings and equipment. Bridge inspections were conducted in 2019 by the Texas Department of Transportation (TxDOT) as part of their Bridge Inventory, Inspection and Appraisal Program (BRINSAP). The available findings of the most recent National Bridge Inspection Program (NBIP) inspections were reviewed and are reflected in this report. In cases where analysis for the 2019 bridge inspections is not complete, the 2017 data is reflected.

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 1, below.

Table 1: Roadway Inspection Elements

CATEGORY	ITEM	DESCRIPTION OF INSPECTION
Pavement	Pavement & shoulders	General condition of pavement and shoulders
	Curb/Gutter	Identification of deficiencies such as settlement, cracking, and displacement
	Joints	Identification of deficiencies including joint cracking, faulting, and surface deterioration, etc.
Roadside	Culverts	Identification of inadequate drainage at culverts, flumes, and weep holes and condition of safety treatments
	Ditches	Presence of erosion, silting, presence of debris, lack of vegetation, etc.
	Grates/Inlets/Piping	Identification of inadequate drainage at pipes, grates, and inlets
	Ponds	Identification of inadequate drainage, evidence of erosion, and malfunctioning components
Misc.	Signs	Conditions associated with mainline 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	Presence of wear and tear of striping and markings to include day and night visibility and section loss
	Raised Pavement Markers	Condition of raised pavement markers to include missing markers and proper day and night visibility
	Delineators	Condition of delineation to include missing delineators and proper day and night visibility
	Metal Beam Guard Fence (MBGF)	Condition of 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
	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 their components, bridge underdeck lights, and night time inspections for proper operation	

1.0 Introduction *continued*

All bridges constructed on the Mobility Authority System, with the exception of the pedestrian bridges, are inspected as part of TxDOT's BRINSAP program to implement the National Bridge Inspection Standards (NBIS). These standards are issued by the Federal Highway Administration (FHWA) and discussed in detail in the Code of Federal Regulations (CFR), 23 CFR 650C. These standards require all bridges on the Texas Transportation Commission (TTC) designated State Highway System 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 inspected the bridges on 183A Turnpike, 290E, SH 71 Express, and 183 South Interim Build in 2019, as part of their On-System bridge inventory. The resulting reports were provided to the Mobility Authority and serve as the basis for the comments and recommendations in the bridge portion of this report.

The existing bridge conditions are rated and grouped by the following categories: (1) Deck; (2) Substructure; (3) Superstructure; (4) Channel; (5) Culverts; (6) Approaches; (7) Miscellaneous and (8) Traffic Safety. Each category consists of specific features that were inspected, as shown in Table 2, below.

Table 2: Bridge Inspection Elements

CATEGORY	DESCRIPTION OF INSPECTION
Deck	Condition of the deck surface, its associated joints, rail, sidewalks/medians, striping, and drainage on top of the bridge structure
Superstructure	Condition of concrete beams, beam connections and bearings
Substructure	Condition of columns, bents, abutments, foundations, and riprap
Channel	Condition of the stream or creek being crossed by the bridge
Culverts	Condition of the headwalls, wingwalls, slab footing, safety devices and other associated items
Approaches	Condition of the approach slabs, rail leading up to the bridge, guard fence, and retaining walls at the bridge abutments
Miscellaneous	Condition of the warning devices such as vertical under clearances, signs, illumination and utility lines
Traffic Safety	Condition of approach rails and impact attenuators

To ensure the health of the System, both new and existing retaining and noise walls, as well as the various components of retaining and noise walls were rated and grouped in categories described in Table 3, below.

Table 3: Wall Inspection Components

CATEGORY	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

For the purpose of this report, the existing building conditions were rated and grouped by the following categories: (1) Architectural; (2) Structural; (3) Mechanical and (4) Electrical. Each category consisted of specific features that were inspected, as shown in Table 4, page 8.

Table 4: Building Inspection Elements

CATEGORY	ITEM	DESCRIPTION OF INSPECTION
Architectural	Building Exterior	Condition of walls, glazing, decks, stairs, handrails, sealants, soffits, doors, paint, and signage
	Building Interior	Conditions of the lobby, finishes, stairs, doors, restrooms, security system, and ceiling tile
	Roof	Condition of the surface condition, seams, expansion joints, and access
	Drainage	Condition of the roof drains, secondary drainage, gutters, downspouts, and edge flashing
	Site	Condition of the ramps, rails, lighting, retaining walls, screen walls, landscaping, irrigation, and parking
Structural	Structural	Condition of the foundation, ground floor slab, grade beams, walls, elevated floor slabs, roof, columns, and joints
Mechanical	Mechanical	Condition of cooling and heating systems, air handlers, exhaust fans, ductwork, piping, and insulation
	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
	Fire Protection Systems	Condition of fire protection systems and backflow preventers
Electrical	Electrical	Condition of the primary transformer, step-down transformer, electrical room, wiring, conduits, emergency power, and communication systems

The Overhead Sign Bridges located on each roadway were inspected as part of this report. The inspection covered the structural items of the structures, as shown in Table 5, below.

Table 5: Overhead Sign Bridge Elements

CATEGORY	DESCRIPTION OF INSPECTION
Structural	Condition of the foundation
	Condition of the concrete columns
	Condition of the truss connection to the column, including the bolts
	Condition of the arm chords on the truss

The toll system infrastructure required to accommodate the Toll Collection System (TCS) consists of various components at each remote tolling location including, but not limited to those indicated in Table 6, below.

Table 6: TCS Inspection Elements

CATEGORY	DESCRIPTION OF INSPECTION
TCS	Retaining walls and copings
	Drainage features
	Civil site work, including grading, access driveways and fencing
	Toll gantries, including foundations and gantry structures
	In-Lane Processing (ILP) Equipment Enclosures, environmental protection and climate controls for housing the electronic equipment. ILP Equipment Enclosures consist of either cabinets or communications hub buildings.
	Conduit and ground boxes providing connections between the ILPs and the Electronic Toll Collection (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
	Signing, pavement markings, traffic barriers and other roadway appurtenances required at each remote tolling location

1.0 Introduction *continued*

The assessment is based on general visual observations made in the field without conducting any detailed in-place testing. Inspection data is collected and organized in real-time by means of computer tablets pre-loaded with a GIS-based collection application for visualization and analysis. The GIS base maps and output data are spot-checked to verify accuracy and consistency. 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 Performance Based Maintenance Contractor (PBMC) or the construction contractor to be addressed.

No representation or warranty is made that all defects have been discovered or that additional defects will not appear in the future. An inspection rating scale of 1 to 5 is used to determine the severity of the asset defect, shown in Table 7, below.

Table 7: Condition Assessment Rating Scale

GRADE	RATING	DESCRIPTION
5	Excellent	Feature is in like-new condition. No deficiencies noted.
4	Good	Feature appearance and functionality/operability are good. No maintenance is required.
3	Degraded	Feature appearance and functionality/operability are below average. Maintenance is required, but does not require emergency repair to protect the System.
2	Unsatisfactory	Feature appearance and functionality/operability are substandard. Maintenance is required, as soon as practical (1), but does not require emergency repair to protect the System.
1	Failing	Feature appearance and functionality/operability are unacceptable. Feature has failed and may require emergency repair to protect the public or System.(2)

NOTES:

- (1) *Timeframe for which, under normal circumstances, repair work would be prioritized and scheduled.*
- (2) *The need for emergency repair will be determined based on response times set forth in maintenance protocols set forth by the Mobility Authority as appropriate for a specific deficiency.*

A rating of 5 indicates the asset is adequately performing or is in “like-new” condition and does not require maintenance action.

A rating of 4 indicates some level of degradation of the asset but has not affected performance and does not require maintenance.

A rating of 3 indicates some level of degradation of the asset performance and requires maintenance action but does not warrant expedited maintenance.

A rating of 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.

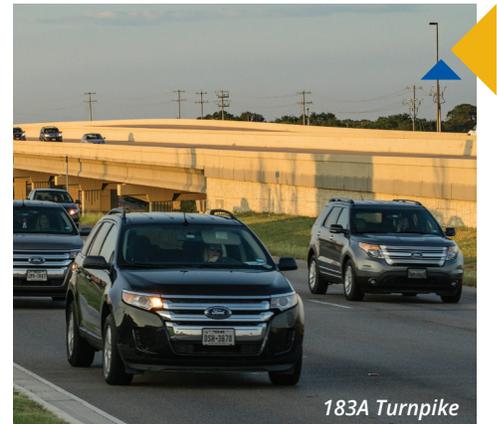
▶ 1.0 Introduction *continued*

1.3 DESCRIPTION OF SYSTEM

The System is currently comprised of the 183A Turnpike, 290E, SH 71 Express, SH 45 Southwest, and the 183 South Interim Build roadways.

1.3.1. 183A TURNPIKE

The Mobility Authority constructed, operates and maintains the 183A Turnpike, a tolled facility stretching 10.4 miles from RM 620 to CR 276 in Williamson County. The all electronic toll collection corridor is a critical link in the highway network serving an area experiencing tremendous development and economic growth. The first phase of 183A Turnpike opened to traffic in March 2007, effectively reducing congestion, enhancing mobility, and providing safer travel. Phase II opened to traffic in April 2012 and included a 4.7-mile extension of the shared use path adjacent to the 183A Turnpike from RM 1431 to Hero Way, resulting in a significant shift of traffic from the non-tolled frontage roads to the new tolled mainlanes. In fall 2015, the intersection of 183A Turnpike and US 183 was reconstructed to make the intersection safer, easier to navigate and enable better access to developments along the 183A Turnpike corridor



1.3.2. 290E

The Mobility Authority constructed, operates, and maintains the 290E, a 6.2-mile limited access toll road along US 290 East, spanning from US 183 to just east of Parmer Lane. The all electronic toll collection corridor is a significant link to important roadways in the region including US 183, IH-35 and SH 130, and provides a critical evacuation route from the Gulf Coast region. The first phase of 290E, which consists of four tolled direct connectors at the US 183 interchange, opened in December 2012. The second phase of the project opened to traffic in May 2014, effectively reducing congestion on US 290 East and bringing reliable travel times for tolled and non-tolled travel.

1.3.3. SH 71 EXPRESS

The Mobility Authority operates and maintains the SH 71 Express, which stretches approximately four miles eastward along SH 71 from Presidential Boulevard to east of SH 130 in Travis County. The project, constructed by TxDOT, added a toll lane in each direction along SH 71 and opened to traffic in February 2017.

The all electronic toll facility enhances traffic flow, mobility, and vehicle and pedestrian safety along SH 71, a key east-west corridor connecting drivers to the Austin-Bergstrom International Airport, the city of Bastrop, and points beyond. The project was designed to eliminate weaving and merging caused by airport-bound traffic exiting SH 71 while sharing the road with through-traffic. It also offers drivers an alternative to the long travel times caused by multiple traffic signals within the project limits. The new lanes offer a free-flowing and reliable bypass route for through-traffic, especially during peak hour congestion.



▶ 1.0 Introduction *continued*

The same number of non-tolled travel lanes that existed prior to the project have been preserved and enhanced. Additionally, approximately five miles of shared use path line both sides of the corridor for bicycle and pedestrian recreation and travel.

1.3.4. SH 45 SOUTHWEST

The Mobility Authority constructed, operates and maintains SH 45 Southwest, a tolled facility stretching 3.6 miles from State Loop 1 to FM 1626 in Southern Travis and Northern Hays County. The all electronic toll collection corridor, which opened to traffic in June 2019, includes two tolled lanes in each direction, and was built without frontage roads to limit impacts to the surrounding environment. The road offers drivers an alternative to congested neighborhood streets like Menchaca Road, Slaughter Lane and Brodie Lane.



1.3.5. 183 SOUTH INTERIM BUILD

The 183 South Project is transforming an 8-mile section of US 183 between US 290 and SH 71 into a new facility built for tolled and non-tolled travel. The project will triple the corridor's previous capacity, adding three tolled lanes and rebuilding three non-tolled, general-purpose lanes in each direction, offering greater mobility for all users of the corridor. Phase 1 opened to traffic in 2019, with Phase 2 anticipated to open in 2020. Aesthetic enhancements are a major project component and are visible in the unique design of the bridges, walls, and other features. The project also includes amenities for active transportation users, including continuous bicycle lanes, a shared use path, sidewalks, four pedestrian bridges, two major trailheads and several smaller trailheads.

1.3.6. FACILITIES/BUILDINGS

Mobility Authority facilities provide support for the safe and reliable operation of the System. These facilities include the Traffic Incident & Management (TIM) Center adjacent to the 183A Turnpike in Cedar Park, the 183A Turnpike maintenance storage yard at the Brushy Creek Road interchange, the 290E maintenance storage yard on Old Manor Road and various roadway ILP structures along the Mobility Authority roadways.

1.4 MAINTENANCE PROGRAM OVERVIEW

The Mobility Authority utilizes a system-wide PBMC to maintain its infrastructure. Also included in the PBMC are Performance-Based Maintenance services for existing and future shared use paths, trailheads and Mobility Authority building facilities, including the TIM Center adjacent to the 183A Turnpike, existing and future maintenance yard buildings, existing and future ILP enclosures, and emergency generators located at or near toll gantries. 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. The general maintenance obligations of the PBMC are as follows:

- (1) Maintain the Project and Related Transportation Facilities in a proactive and timely manner appropriate for a facility of the character of the Project.
- (2) Minimize delay and inconvenience to users and, to the extent the Contractor is able to control, users of Related Transportation Facilities.

▶ 1.0 Introduction *continued*

- (3) Identify and manage incidents and correct all defects and damages from Incidents to include cleanup of spilled cargo, removal and disposal of damaged and unsalvageable materials, obtaining required permits, etc.
- (4) Monitor and observe weather and weather forecasts to proactively deploy resources to minimize delays and safety hazards due to heavy rains, snow, ice or other severe weather events.
- (5) Remove debris, including litter, graffiti, animals, and abandoned vehicles or equipment from the ROW.
- (6) Minimize the risk of damage, disturbance or destruction of third-party property during the performance of maintenance activities.
- (7) Coordinate with and enable the Mobility Authority and others with statutory duties or functions in relation to the Project or Related Transportation Facilities to perform such duties and functions.
- (8) Perform systematic Project inspections and maintenance in accordance with the provisions of Contractor's Maintenance Management Plan (MMP) to include Contractor's Safety and Health Plan and in accordance with the Contract Documents.

The current contract will expire June 30, 2020. The Authority is actively procuring the next performance based maintenance contract, set to commence July 1, 2020. This contract will encompass an initial 5-year term with two optional 5-year terms.

1.5 CONDITION ASSESSMENT

The PBMC is administered by the Mobility Authority. All elements are audited, at minimum, on a monthly basis for contract compliance. In addition, the System and its performance is monitored on a daily basis. These audits are performed by way of a condition assessment consistent with parameters set forth in the PBMC. The condition assessments are conducted on 10% of the roadways on randomly selected sections. This ensures the Contractor is maintaining the facilities within the tolerances established by the performance measures.

▶ 2.0 Annual Report of Conditions

2.1 OVERVIEW

Visual condition assessments were conducted based on the 5-point rating scale described in Table 7. The results of this year's annual inspection indicate the System is performing as expected and is being maintained in an overall good to excellent condition. Corrective measures are being taken to address deficiencies through the Mobility Authority System-wide PBMC.

2.2 183A TURNPIKE

2.2.1. 183A TURNPIKE ROADWAY

▶ ASPHALT PAVEMENT

Although minor issues were noted, the inspection conducted in fall 2019 did not identify any major deficiencies in the asphalt pavement that would affect the safety and operations of 183A Turnpike. For preventative maintenance purposes, an overlay of 183A Turnpike frontage road pavement is tentatively scheduled for 2021. The intent of this overlay will be to rejuvenate the pavement and provide a new driving surface for motorists. This preventative maintenance supports a pavement management plan that is focused on maximizing the useful life.

▶ 2.0 Annual Report of Conditions *continued*

▶ CONCRETE PAVEMENT

Concrete pavement along the mainlanes and frontage roads was found to be in good condition, with some minor deficiencies present. Transverse cracking was noted along the mainlanes. This is normal behavior of continuously reinforced concrete pavement and is not a concern. No corrective measures are needed.

▶ ROADSIDE

In general, roadside features are in good condition. The roadside visual inspection did not identify any deficiencies that were outside of the PBMC scope. Deficiencies will be addressed as part of regularly scheduled maintenance activities. The most common deficiencies noted consisted of sediment buildup and vegetation growth in some of the inlets and cross drainage structures. Also, several driveway culvert and pond inlets were partially clogged.

▶ MISCELLANEOUS

The PBMC includes performance measures for identifying deficiencies and work planning responsibilities for the following miscellaneous roadway inspection elements.

Deficiencies as a result of day and nighttime visual inspection indicate the pavement graphics, markings and markers show signs of wear, lack of reflectivity and are in need of replacement. As part of the PBMC contractor responsibilities, an independent inspection and work plan will be developed to address the deficient graphics, markings and markers.

Signs were assessed by a day and a nighttime visual inspection during the fall 2019 inspections. Most signs were clearly visible and legible to the inspector. Signs along 183A Turnpike are beginning to show signs of fading. A contract for large sign replacement is currently in place for 183A Phase I, with construction anticipated to commence in July 2020.

The illumination elements were inspected for damage and to ensure proper functioning of the lights at night. In general, illumination features are in good condition. Visual inspection did not identify any deficiencies that were outside of the PBMC scope. The most common deficiencies noted were burnt-out light bulbs and are being addressed as part of regularly scheduled maintenance activities.

183A Turnpike has eight traffic signals on the frontage road that are the Mobility Authority's responsibility. There are two located at each of the following four intersections: Crystal Falls Parkway, Hero Way, Scottsdale Drive and San Gabriel Parkway. The signals were found to be in good condition with only minor deficiencies.

183A Turnpike 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 erosion, vegetative growth at inlet and outlet drainage structures, sediment and trash buildup and isolated incidents of ponds not draining properly.

2.2.2. 183A TURNPIKE BRIDGES

All of the 183A Turnpike bridges were inspected and evaluated in 2019, as part of TxDOT's BRINSAP Program, which occurs every two years per federal requirements. The available findings of the most recent National Bridge Inspection Program (NBIP) inspections were provided to the Mobility Authority and serve as the basis for the comments and recommendations for the Bridge portion of this report. In cases where data analysis of the 2019 bridge inspections is not complete, the 2017 data is reflected.

A summary of the TxDOT bridge inspection reports for 183A Turnpike 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 the 183A Turnpike. These bridges were found to be in good condition.

▶ 2.0 Annual Report of Conditions *continued*

Based on a review of the most recent inspection reports and visual observations, all 183A Turnpike bridges, including those for the shared use path, remain in good condition. Deficiencies found do not fall outside of the PBMC scope and will be addressed as part of regularly scheduled maintenance activities. The most common deficiencies noted were hairline longitudinal and transverse cracks, loss of adhesion and missing sealant at bridge joints, and channel erosion. There also appears to be an issue with a deck drain pipe on the bridge over Crystal Falls Parkway.

2.2.3. 183A TURNPIKE RETAINING WALLS

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

183A Turnpike retaining walls were found to be in good condition. Deficiencies found do not fall outside of the PBMC scope and will be addressed as part of regularly scheduled maintenance activities. The majority of the defects noted included the presence of vegetation growth causing minor drainage obstruction, minor cracking of panels, and minor spalling from precast coping.

2.2.4. 183A TURNPIKE BUILDINGS FACILITIES

The 183A Turnpike inspection consisted of visual observations of the Mobility Authority's TIM Center/Park Street Plaza building. ILP enclosures were also inspected and are described in Section 2.2.7, 183A Turnpike Toll Collection System.

A summary of the Mobility Authority's TIM Center and the associated general conditions are described in the 183A Turnpike Inspection Report. Overall, the TIM Center is in good condition. The following is a general summary of condition assessment for each building category.

- ▶ **BUILDING EXTERIOR**
Building exterior components, including wall systems, sealants, paint, and doors are in excellent condition.
- ▶ **ROOFING**
The surface, seams, expansion joints and roofing were observed to be in good to excellent condition.
- ▶ **BUILDING INTERIOR**
Building interior components, including the TIM Center lobby area, corridor finishes, windows, restrooms, security, and paint were in good condition. Deficiencies observed included minor scratches in hallways and the TIM Center breakroom, minor water puddling at the TIM Center front loading dock door, and minor scuffing in TIM Center office flooring.
- ▶ **SITE IMPROVEMENTS**
Site improvement components were observed to be in good condition. Deficiencies noted were exposed areas in the irrigation system, as well as faded parking striping at the TIM Center building.
- ▶ **STRUCTURE**
Structural components were observed to be in good to excellent condition.
- ▶ **ELECTRICAL SYSTEMS**
Electrical components, including panels, wiring, emergency power, and lighting were in good condition. Deficiencies noted were the GFCI outside the TIM Center mechanical room not functioning and two locations at the TIM Center where junction boxes need to be secured to cover exposed wiring.
- ▶ **MECHANICAL SYSTEMS**
Mechanical components, including cooling, heating, air handlers, exhaust fans, and alarm systems were in excellent condition.

▶ 2.0 Annual Report of Conditions *continued*

▶ FIRE PROTECTION

All fire protection equipment appeared to be in good working order. Fire suppression systems will be inspected by a licensed professional as there are no panels available to check the status of the system.

2.2.5. 183A TURNPIKE 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 TIM Center, meets the immediate needs for storage of equipment and materials. The building and the surrounding areas remain in good condition. Deficiencies noted were drain clean-outs that were broken, super sack bags degrading from sun exposure, and some material storage that were potential tripping hazards.

2.2.6. 183A TURNPIKE 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.

The inspection did not reveal any unsatisfactory deficiencies in the condition and operation of the toll gantries and sign structures. The most common deficiencies noted were galvanization failure and cosmetic spalls and rusting.

2.2.7. 183A TURNPIKE TOLL COLLECTION SYSTEM

The basic components for the TCS are the TCS Infrastructure, the TCS Operations and Maintenance, the Customer Service Center, and the Violation Processing Center. The TCS is fully interoperable with all Texas toll roads so 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 separate contracts.

The fall 2019 annual inspection, performed by the GEC, only included inspection of the toll infrastructure; it did not include inspection of the tolling equipment itself as this equipment is inspected by a separate party.

The 183A toll infrastructure includes 8 ILP enclosures, which are communication hub buildings that house various ETC equipment and are located at the NB exit and SB entrance ramps for Brushy Creek Road, the NB entrance and SB exit ramps for Crystal Falls Parkway, Crystal Fall Parkway Mainlane, NB and SB Lakeline Mainlane, and the NB Scottsdale Drive exit ramp. Emergency generator sites serve the toll locations.

Overall, the ILP enclosures on 183A Turnpike are in good condition. The inspection of the Mobility Authority's ILP enclosures and the associated general conditions are described in the 183A Turnpike Inspection Report. The following is a general summary of condition assessment for each hub building category.

▶ HUB BUILDING EXTERIOR AND ROOFING

Building exterior components, including wall systems, sealants, paint, and doors are in good condition.

Roofing components, such as roof surface, seams, and expansion joints were observed to be in good to excellent condition. Deficiencies noted were surface rust on an exterior door and isolated mold/mildew on the south wall at the SB Lakeline Mainlane ILP enclosure, and isolated mold/mildew on the SW corner of the NB Scottsdale ILP enclosure.

▶ HUB BUILDING INTERIOR

Building interior components, including finishes, doors, and paint were in good condition. Deficiencies observed were interior walls having sign of mildew, although it appears that most have been addressed from the previous inspection.

▶ 2.0 Annual Report of Conditions *continued*

▶ **SITE IMPROVEMENTS**

Site improvement components were observed to be in good condition. Deficiencies noted were faded parking striping at the NB and SB Brushy Creek locations, faded LP tank NFPA label at NB Crystal Falls ILP, Crystal Falls Mainlane, and NB Scottsdale locations, and GFCI not operational at the NB and SB Lakeline Mainlane locations.

▶ **STRUCTURE**

Structural components were observed to be in good to excellent condition.

▶ **ELECTRICAL SYSTEMS**

Electrical components, including panels, wiring, emergency power, and lighting were in good condition. Deficiencies noted were the GFCI not operational at the NB and SB Brushy Creek locations, conduit duct seal missing at the NB and SB Brushy Creek locations, and GFCI not operational at the NB and SB Lakeline Mainlane locations.

▶ **MECHANICAL SYSTEMS**

Mechanical components, including cooling, heating, air handlers, exhaust fans, and alarm systems were in excellent condition.

▶ **FIRE PROTECTION**

All fire protection equipment appeared to be in good working order. Fire suppression systems will be inspected by a licensed professional as there are no panels available to check the status of the system.

2.3 290E

As of December 16, 2019, the warranty as part of the Comprehensive Development Agreement (CDA) has expired.

2.3.1. 290E ROADWAY

▶ **PAVEMENT**

Ride quality on concrete pavement mainlanes to include bridge approach and departure transitions, continues to show signs of degradation. The Mobility Authority has implemented a strategy to actively monitor the condition and perform routine maintenance repairs to stabilize the pavement. Additional field testing has been performed and will provide data in support of an effective remediation strategy, preventing further movement.

Despite ride quality concerns, the concrete pavement along the mainlanes was found to be in good condition, with some minor deficiencies present. Transverse cracking was noted along the mainlanes. This is normal behavior of continuously reinforced concrete pavement and is not a concern. The most common deficiencies found were unsealed longitudinal cracks, rutting in asphalt pavement, and spalling at longitudinal construction joints. These noted deficiencies do not fall outside of the PBMC scope and will be addressed as part of regularly scheduled maintenance activities.

▶ **ROADSIDE**

With roadside features having been constructed within the last few years, most are in good to excellent condition. Deficiencies found do not fall outside of the PBMC scope and will be addressed as part of regularly scheduled maintenance activities. The most common deficiencies noted consisted of slope erosion causing pavement edge drop offs, and vegetation and siltation of drainage elements. There was one instance of guardrail damage approaching a bridge which has since been repaired as part of the routine maintenance activities.

▶ **MISCELLANEOUS**

The PBMC includes performance measures for identifying deficiencies and work planning responsibilities for the following miscellaneous roadway inspection elements.

▶ 2.0 Annual Report of Conditions *continued*

Deficiencies as a result of day and nighttime visual inspection indicate the pavement graphics, markings and markers show signs of wear, lack of reflectivity and are in need of replacement. As part of the PBMC contractor responsibilities, an independent inspection and work plan will be developed to address the deficient graphics, markings and markers.

Signs were assessed by a day and a nighttime visual inspection during the fall 2019 inspections. With the exception of a few small signs, signs were clearly visible and legible to the inspector. The signs along 290E are still in good condition and most do not need to be replaced at this time. It is recommended that reflectivity testing be performed every three to five years to ensure compliance with requirements.

The illumination elements were inspected for damage and proper functioning of the lights at night. Deficiencies found do not fall outside of the PBMC scope and will be addressed as part of regularly scheduled maintenance activities. The most common deficiencies noted were bulb outages on high mast light poles, or were sections of lights out on continuous and/or safety light poles.

Minimal deficiencies were observed on 290E retention ponds. Only a few elements were identified as minor problems, with the most common deficiencies consisting of minor vegetation and silt buildup at inlets. Pond deficiencies found do not fall outside of the PBMC scope and will be addressed as part of regularly scheduled maintenance activities.

2.3.2. 290E BRIDGES

All of the 290E bridges were inspected and evaluated in 2019, as part of TxDOT's BRINSAP Program, which occurs every two years per federal requirements. The available findings of the most recent National Bridge Inspection Program (NBIP) inspections were provided to the Mobility Authority and serve as the basis for the comments and recommendations for the Bridge portion of this report. In cases where data analysis of the 2019 bridge inspections is not complete, the 2017 data is reflected.

A summary of the bridge inspection reports for the 290E is provided in the 290E Detailed Inspection Report.

As part of an ongoing plan to address ride quality caused by uneven transitions from the roadway section to the bridge section, repairs were made in August 2017. These repairs were made using foam injection to lift and stabilize this location, realigning the approach and departure slabs with the adjacent pavement, ultimately improving the ride quality for the driver. In addition, this smooth transition ensures less wear and tear on the bridge and adjacent pavement. Additional locations were identified during the fall 2019 inspection and are being monitored.

The pedestrian bridge was inspected by the GEC in fall 2019 with no significant deterioration noted.

Based on a review of the most recent inspection reports and visual observations, 290E bridges are in good condition. The most common deficiencies notes were channel erosion, hairline cracking of bridge components, and spalling and pavement settlement at bridge approaches.

2.3.3. 290E RETAINING WALLS

The retaining walls on the 290E corridor consist primarily of MSE walls. Based on visual observations, retaining walls on 290E are in good condition. Deficiencies found do not fall outside of the PBMC scope and will be addressed as part of regularly scheduled maintenance activities. The majority of the defects noted were panel spalling, minor cracks at abutment wall caps, and vegetation growth which can cause minor drain obstruction and minor panel misalignment.

2.3.4. 290E MAINTENANCE STORAGE YARDS

The Maintenance Storage Yard on Manor Road near 290E provides a secured area for storage of various materials, including signs, lighting poles and fixtures, and other miscellaneous materials. The facility also

▶ 2.0 Annual Report of Conditions *continued*

stores a fully operational anti-icing storage tank and space for solid de-icing agents. The facility remains in good condition. As part of the PBMC's crack seal operations, cracking noted in the fall 2018 inspection was addressed. The fall 2019 inspection observed additional cracking in the outer portions of the maintenance yard pavement. Other deficiencies noted were super sack bags exposed to the elements, some material storage with the potential for a tripping hazard, vegetation growing in sediment pond, and a drain cap broken that appears to be blocked with debris.

2.3.5. 290E 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.

The inspection did not reveal any unsatisfactory deficiencies in the condition or operation of the toll gantries and sign structures. Inspectors observed minor cracking and spalling, which does not require immediate attention. This should continue to be monitored during future condition inspections to ensure that safety and operations is not adversely impacted.

Other observations 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 a cosmetic concern. Minor galvanization was observed with no rust present on overhead sign bridges. The Mobility Authority is monitoring the condition.

2.3.6. 290E TOLL COLLECTION SYSTEM

The basic components for the TCS are the TCS Infrastructure, the TCS 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 2019 annual inspection performed by the GEC only included inspection of the toll Infrastructure. It did not include inspection of the tolling equipment itself. This equipment is inspected by a separate party.

The 290E toll infrastructure includes 10 ILP enclosures, consisting of 3 hub buildings and 7 cabinets that house various ETC equipment, and are located at the WB and EB tolling locations at the 183S direct connect flyovers; the Parmer mainlane tolling location; Giles mainlane; EB and WB Giles ramp locations; EB and WB Harris Branch locations; and the EB and WB Springdale locations. Emergency generators serve all tolling locations.

Overall, the ILP enclosures on 290E are in good condition. A summary of the Mobility Authority's ILP enclosures and the associated general conditions are described in the Detailed Inspection Report. The following is a general summary of condition assessment for each category.

▶ HUB BUILDING EXTERIOR AND ROOFING

Building exterior components for the ILP enclosures, including wall systems, sealants, paint, and doors are in good condition. Roofing on the ILP enclosures, including surfaces, seams, and expansion joints at all 3 locations are in good to excellent condition. It was noted that the ILP enclosure exterior door hardware at Parmer Lane needs repair.

▶ HUB BUILDING INTERIOR

The interior at Parmer Lane was not accessible due to malfunctioning exterior door hardware. The remaining building interior components, including the finishes, doors, and paint were in good to excellent condition.

▶ SITE IMPROVEMENTS

Site improvement components, including lighting and fences, were observed to be in good to excellent condition.

▶ 2.0 Annual Report of Conditions *continued*

▶ STRUCTURE

Structural components, including foundations and floor slabs on the ILP enclosures at all 3 locations, are in good to excellent condition.

▶ ELECTRICAL SYSTEMS

The electrical systems appear to be in good condition. Deficiencies found include a missing electrical panel label at the Parmer ILP enclosure, and GFCIs on the exterior of both the Parmer ILP enclosure and the 183 DC WB ramp ILP enclosure that is not operational.

▶ MECHANICAL SYSTEMS

Mechanicals systems components, including cooling, exhaust fans, and alarm systems at all 3 locations, are in good to excellent condition.

▶ FIRE PROTECTION

All fire protection equipment appeared to be in good working order. Fire suppression systems will be inspected by a licensed professional as there are no panels available to check the status of the system.

2.4 SH 71 EXPRESS

As part of the Design-Build (D/B) agreement between TxDOT and their contractor, a warranty provision is in place for various items, as summarized in Table 8, below.

Table 8: SH 71 Express Warranty Performance and Measurement Table Baseline

ELEMENT CATEGORY	REF	ELEMENT	WARRANTY TERM	TXDOT INSPECTION AND MEASUREMENT METHOD	PERFORMANCE REQUIREMENT
ROADWAY	Unless stated otherwise, measurements shall be conducted using procedures, techniques, and measuring equipment consistent with TxDOT's <i>Pavement Management Information System (PMIS) Rater's Manual</i>.				
	1.2	Pavement	5 years, except for mill and overlay section shaving a 2-year performance Warranty Term per Note 1	<p>b) Ruts – Mainlanes: shoulders & ramps depth as measured using an automated device in compliance with TxDOT Standards.</p> <p>10ft straight edge used to measure rut depth for localized areas.</p> <p>c) Ride Quality: Measurement of International Roughness Index (IRI) according to TxDOT standard Tex-1001-S, Operating Inertial Profilers and Evaluating Pavement Profiles</p> <p>3-ft straight edge used to measure discontinuities</p> <p>d) Failures: Instances of failures exceeding the failure criteria set forth in the TxDOT PMIS Rater's Manual, including potholes, base failures, punchouts and jointed concrete pavement failures</p> <p>f) Skid resistance: ASTM E274/E274M-11 Standard Test Method for Skid Resistance Testing of Paved Surfaces at 50 MPH using a full scale smooth tire meeting the requirements of ASTM E524-08 .</p>	<p>No wheel path length with ruts greater than ¼" in depth</p> <p>No length with depth of rut at any location greater than 0.5"</p> <ul style="list-style-type: none"> • Mainlanes, ramps – no results greater than 95" per mile • Frontage roads – no results greater than 120" per mile <p>No individual discontinuities greater than 0.75"</p> <p>No occurrence of failure</p>

2.0 Annual Report of Conditions *continued*

ELEMENT CATEGORY	REF	ELEMENT	WARRANTY TERM	TXDOT INSPECTION AND MEASUREMENT METHOD	PERFORMANCE REQUIREMENT
ROADWAY					
	1.3	Crossovers and other paved areas	2 years	a) Potholes b) Base failures	No potholes of low severity or higher No base failures of low severity or higher
	1.4	Joints in concrete	5 years	Visual inspection of joints Measurement of joint width and level difference of two sides of joints	No length with unsealed joints greater than ¼" No joint width more than 1" or faulting more than ¼"
	1.5	Curbs	2 years	Visual inspection	Less than 1" deflection out of alignment over 10'
DRAINAGE					
	2.2	Drainage treatment devices	2 years	Visual inspection	Devices functioning correctly with means of operation displayed
	2.3	Travel Way	2 years	Visual inspection of water on surface	The travel way is free from water to the extent that such water would represent a hazard by virtue of its position and depth.
	2.4	Discharge systems	2 years	Visual inspection and records	Surface water discharge systems perform their proper function and discharge to groundwater and waterways complies with the relevant permits and other legal requirements.
STRUCTURES					
	3.1	Structures having an opening measured along the center of the roadway of more than 20 feet between undercopings of abutments or springlines of arches or extreme ends of openings or multiple boxes	5 years	Inspection and assessment in accordance with the requirements of federal National Bridge Inspection Standards (NBIS) of the Code of Federal Regulations, 23 Highways – Part 650, the TxDOT Bridge inspection Manual, and the Federal Administration's Bridge Inspector's Reference Manual	No occurrences of condition rating below seven for any deck, superstructure, substructure or components as required in the TxDOT Bridge Inspection Manual.
	3.3	Non-bridge class culverts	5 years	Visual inspection	Non-bridge-class culverts are free of: <ul style="list-style-type: none"> • defects in sealant to movement joints • scour damage
	3.4	Gantries and high masts	5 years	Visual inspection	Sign signal gantries, high masts are structurally sound and free of defects in surface protection systems
	3.5	Load ratings	5 years	Load rating calculations in accordance with the Manual for Bridge Evaluation and the TxDOT Bridge Inspection Manual. Load restriction requirements as per the TxDOT Bridge Inspection Manual	All structures maintain the design load capacity.

2.0 Annual Report of Conditions *continued*

ELEMENT CATEGORY	REF	ELEMENT	WARRANTY TERM	TXDOT INSPECTION AND MEASUREMENT METHOD	PERFORMANCE REQUIREMENT
PAVEMENT MARKINGS, OBJECT MARKERS, BARRIER MARKERS AND DELINEATORS					
	4.1	Pavement markings	2 years	a) Markings General - Physical measurement Profile Markings - Visual inspection	No Length with no more than 5% loss of area of material at any point Length performing its intended function and compliant with relevant regulations
	4.2	Raised reflective markers	2 years	Visual inspection	Markings are functioning as intended
GUARDRAILS, SAFETY BARRIERS AND IMPACT ATTENUATORS					
	5.1	Guard rails and safety barriers	2 years	Visual inspection	All guardrails, safety barriers, concrete barriers, etc. are free of construction defects and remain at correct height.
	5.2	Impact attenuators	2 years	Visual inspection	All impact attenuators remain as installed.
TRAFFIC SIGNS					
	6.1	General – All Signs	2 years	a) Retroreflectivity: Coefficient of retro reflectivity b) Face damage: Visual inspection c) Placement: Visual inspection	No signs with reflectivity below the requirements of TxDOT's TMUTCD and free from structural and electrical defects No signs with face damage greater than 5% of area, unless caused by a third party Sign mounting posts are structurally sound and rust free
TRAFFIC SIGNALS					
	7.2	Soundness	2 years	a) Structural soundness Visual inspection b) Electrical soundness	Traffic Signals, Pedestrian Elements and Vehicle Detectors are structurally and electrically sound Inspection records showing compliance
LIGHTING					
	8.1	Roadway Lighting – General	2 years		Columns are upright, correctly founded, visually acceptable and structurally sound
	8.3	Electrical Supply	2 years	Testing to meet NEC regulations, visual inspection	Electricity supply, feeder pillars, cabinets, switches and fittings are electrically, mechanically and structurally sound and functioning
	8.5	High Mast Lighting	2 years		All winch and safety equipment is correctly functioning. (for structural requirements refer to Element Category 3)
FENCES, WALLS AND SOUND ABATEMENT					
	9.2	Construction	5 years	Structural assessment if visual inspection warrants	Integrity and structural condition of the fence is maintained

▶ 2.0 Annual Report of Conditions *continued*

ELEMENT CATEGORY	REF	ELEMENT	WARRANTY TERM	TXDOT INSPECTION AND MEASUREMENT METHOD	PERFORMANCE REQUIREMENT
EARTHWORKS, EMBANKMENTS AND CUTTINGS					
	12.1	Slope Failure	5 years	Visual inspection by geotechnical specialist and further tests as recommended by the specialist	All structural failures of the embankment and cut slopes of the Facility are repaired
ITS EQUIPMENT					
	13.5	Vehicle Detection Equipment	2 years	Defect measurement dependent on equipment Traffic Detector Loops: Loop circuit's inductance to be > 50 and <1,000 micro henries. Insulation resistance to be > 50 meg ohms.	All equipment free of defects and operational problems such as; <ul style="list-style-type: none"> • Inoperable loops. • Malfunctioning camera controllers.
PLANT MATERIALS					
	14.1	Trees, Shrubs, and Other Plant Materials	1 year	Visual inspection of trees, shrubs, and other	All trees, shrubs, and other plant materials shall be in healthy condition. <ul style="list-style-type: none"> • Remove dead plants within ten (10) Business Days of discovery. • Replace such plants during the next planting season.

NOTE 1: Where indicated, mill and overlay sections specified in Technical Provisions Section 1.2.1 shall meet performance requirements for a period of 2 years from Final Acceptance (rather than for the 5-year Warranty Term generally applicable to the element category).

2.4.1. SH 71 EXPRESS ROADWAY

▶ PAVEMENT

The newly constructed concrete pavement sections along the corridor are in good to excellent condition. Deficiencies found do not fall outside of the PBMC scope and will be addressed as part of regularly scheduled maintenance activities. The most common deficiencies noted were edge drop-offs and rutting. There is a ride quality issue at one location across lanes in both directions where the pavement transitions from concrete to existing flexible pavement. These values exceed the warranty threshold referenced in Table 8, section 1.2 Pavement, Ride Quality. This issue does not require immediate attention; however, it should continue to be monitored during the warranty period. CTRMA has been in discussions with TxDOT regarding this issue.

▶ ROADSIDE

Roadside elements on SH 71 Express are in good condition. Deficiencies found do not fall outside of the PBMC scope and will be addressed as part of regularly scheduled maintenance activities. The most common deficiencies noted were concrete barrier spalls, partial drainage inlet and pipe blockage, and ditch and slope erosion. There was also a guardrail end treatment at a single location which had been damaged due to a collision and has since been repaired.

▶ MISCELLANEOUS

Overall, pavement striping, symbols and reflective pavement markers are in good condition. There were minimal locations observed where striping is starting to exhibit wear and reduced reflectivity. Deficiencies found do not fall outside of the PBMC scope and will be addressed as part of regularly scheduled maintenance activities.

2.0 Annual Report of Conditions *continued*

2.4.2. SH 71 EXPRESS BRIDGES

All of the SH 71 Express bridges were inspected and evaluated in 2019, as part of TxDOT's BRINSAP Program, which occurs every two years per federal requirements. The available findings of the most recent National Bridge Inspection Program (NBIP) inspections were provided to the Mobility Authority and serve as the basis for the comments and recommendations for the Bridge portion of this report. In cases where data analysis of the 2019 bridge inspections is not complete, the 2017 data is reflected.

Based on a review of the most recent inspection reports and visual observations, SH 71 Express bridges are in good to excellent condition.

2.4.3. SH 71 EXPRESS RETAINING WALLS

The retaining walls on the SH 71 Express corridor consist primarily of MSE walls. Based on visual observations, newly constructed retaining walls on SH 71 Express are in excellent condition. Only a few elements were identified as minor problems, with the most common deficiency being silt build-up at drainage inlets, vegetation, and minor spalling on panel walls.

2.4.4. SH 71 EXPRESS 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.

All inspected elements appear to be in good to excellent condition. Inspectors observed minor cracking and spalling on columns, as well as minor galvanization on trusses.

2.4.5. SH 71 EXPRESS TOLL COLLECTION SYSTEM

The basic components for the TCS are the TCS Infrastructure, the TCS 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 2019 annual inspection performed by the GEC only included inspection of the toll Infrastructure. It did not include inspection of the tolling equipment itself. This equipment is inspected by a separate party.

The SH 71 Express toll infrastructure includes one ILP enclosure, which is a communication hub building that houses various ETC equipment and is located on the south side of the toll gantry, east of FM 973. An emergency generator site that serves the tolling location is located next to the ILP. The exterior, interior, structural, electrical, and mechanical cooling components of the ILP enclosure are in excellent condition. However, it was observed that the generators do not appear to be grounded.

2.5 SH 45 SOUTHWEST

For SH 45 Southwest, a warranty provision is in place for various items, as summarized in Table 9, below.

Table 9: SH 45 Southwest Summary of Project Warranties

GENERAL SUBJECT	WARRANTY PERIOD AFTER FA
Flexible Pavement (PFC and Asphalt): Cracking, Debonding, Raveling, Flushing, Pop outs, Rutting, Failures, Permeability, and Settle	2 Years
Concrete (Rigid) Pavement: Settlement	2 Years
Concrete (Rigid) Pavement: Cracking, Joint Deficiencies, and Surface Defects	2 Years
Monument Sign Lighting: Free from material and workmanship defects	1 Year
Radar Presence Detection Devices (RPDD): Free from material and workmanship defects	5 Years
Radar Advance Detection Devices (RADD): Free from material and workmanship defects	5 Years
Battery Back-Up System for Signal Cabinets: Replace when non operable due to defect in material or workmanship	5 Years
ITS Solar Power System	3 Years
Detention Pond Control System	1 Year
Ethernet Cable and Connectors	1 Year

2.5.1. SH 45 SOUTHWEST ROADWAY

▶ PAVEMENT

The newly constructed pavement sections along the corridor are in excellent condition. Visual Inspection did not identify any deficiencies that were outside of the PBMC scope. The most common deficiencies noted were edge drop offs at several locations. Deficiencies will be addressed as part of regularly scheduled maintenance activities.

▶ ROADSIDE

The roadside elements along the SH 45 Southwest corridor are in excellent condition. Visual Inspection did not identify any deficiencies that were outside of the PBMC scope. Only a few deficiencies were noted, such as minor erosion that was observed along rock riprap.

▶ MISCELLANEOUS

Overall, pavement striping, symbols and reflective pavement markers are in excellent condition with minimal deficiencies.

Minimal deficiencies were observed on SH 45 Southwest retention ponds. The most prevalent deficiency consisted of sediment build-up in drainage structures. In addition, pond logic controllers are malfunctioning and are being addressed through construction warranty provisions.

2.5.2. SH 45 SOUTHWEST BRIDGES

With the SH 45 Southwest corridor having just opened last summer, bridges were not inspected this 2019 cycle. Bridges will be included in the next inspection cycle anticipated for 2021 as part of the TxDOT's BRINSAP Program, which occurs every two years per federal requirements.

▶ 2.0 Annual Report of Conditions *continued*

2.5.3. SH 45 SOUTHWEST RETAINING WALLS

The retaining walls on the SH 45 Southwest corridor consist primarily of MSE walls. Based on visual observations, newly constructed retaining walls on SH 45 Southwest are in excellent condition. Deficiencies noted included silt and debris in a flume, corners broken on coping at interface with a mow strip, and vegetation growth between a wall and mow strip.

2.5.4. SH 45 SOUTHWEST 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. All inspected elements appear to be in excellent condition and no deficiencies were noted.

2.5.5. SH 45 SOUTHWEST TOLL COLLECTION SYSTEM

The basic components for the TCS are the TCS Infrastructure, the TCS 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 2019 annual inspection performed by the GEC only included inspection of the toll Infrastructure. It did not include inspection of the tolling equipment itself. This equipment is inspected by a separate party.

SH 45 Southwest toll infrastructure includes one ILP enclosure, which is a cabinet that houses various ETC equipment, and is located on the west side of the mainlane tolling location, approximately 2.3 miles southeast of Loop 1. An emergency generator site that serves the tolling location is located next to the ILP. The visual inspection of the toll system infrastructure indicates that the primary components are in excellent condition. Efforts should be made to continue to keep all components clean, well maintained and secure for the TCS.

2.6 183 SOUTH INTERIM BUILD

2.6.1. 183 SOUTH INTERIM BUILD ROADWAY

▶ PAVEMENT

The newly constructed concrete pavement sections along the corridor are in excellent condition with minimal deficiencies. The most common deficiencies noted consists of unsealed longitudinal cracking, as well as two locations where ride is uneven.

▶ ROADSIDE

The roadside elements along the 183 South Interim Build corridor are in excellent condition. Only a few deficiencies were noted, such as undesirable vegetation growing in concrete riprap, and areas of silt accumulation in travel lanes. There was also a guardrail end treatment at a single location which had been damaged due to a collision and has since been repaired. Deficiencies will be addressed by the construction contractor.

▶ MISCELLANEOUS

Overall, pavement striping, symbols and reflective pavement markers are in excellent condition with no noted maintenance needs.

2.6.2. 183 SOUTH INTERIM BUILD BRIDGES

Newly constructed bridges on 183 South Interim Build were inspected in fall of 2019 as part of TxDOT's BRINSAP Program. The findings are still being compiled and will be provided to the Mobility Authority when they are available.

2.0 Annual Report of Conditions *continued*

2.6.3. 183 SOUTH INTERIM BUILD RETAINING WALLS

The retaining walls were not inspected in this year's cycle due to construction activity in the area.

2.6.4. 183 SOUTH INTERIM BUILD OVERHEAD SIGN BRIDGES

Overhead sign bridges, which would include toll gantries, sign structures and monotube sign structures, were not inspected in this year's cycle due to construction activity in the area.

2.6.5. 183 SOUTH INTERIM BUILD TOLL COLLECTION SYSTEM

The basic components for the TCS are the TCS Infrastructure, the TCS 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 2019 annual inspection performed by the GEC only included inspection of the toll Infrastructure. It did not include inspection of the tolling equipment itself. This equipment is inspected by a separate party.

The 183 South Interim Build corridor includes 5 ILP enclosures, which are cabinets that house various ETC equipment, and are located at the NB and SB mainlane tolling locations, as well as the ramp tolling locations at the MLK St on and off ramps, and the 51st on-ramp. Emergency generator sites serving the tolling locations are located next to the ILPs. The visual inspection of the toll system infrastructure indicates that the primary components remain in excellent condition. Efforts should be made to continue to keep all components clean, well maintained and secure for the TCS.

3.0 Ongoing Initiatives

3.1 ASSET MANAGEMENT

The Mobility Authority Board of Directors approved a budget for implementation of a formal Transportation Asset Management Plan (TAMP). As part of this TAMP, the Mobility Authority has begun implementation of a web-enabled integrated Geographic Information System (GIS), enterprise asset management software solution.

Data collection providing inventory of assets to include pavement, bridges, drainage, walls, traffic devices, environmental features and special features such as shared-use paths has been completed. The Mobility Authority will utilize a production version of software to serve as their Computerized Maintenance Management System (CMMS). Record collection of maintenance activity accomplishment associated with the asset inventory will begin by July 1, 2020. The new PBMC will require the maintenance contractor to utilize the CMMS, directly entering day to day work requests, reporting work accomplishments and other reporting requirements as described in the PBMC documents. The Mobility Authority will utilize the CMMS to manage the PBMC.

The Mobility Authority has implemented a pavement management program, collecting pavement condition data as scheduled. This inventory and maintenance history will be utilized to support the Mobility Authority in decision-making, providing a strategy to proactively manage its program.

3.2 QUARTERLY SAFETY COMMITTEE MEETINGS

Each quarter, the Mobility Authority evaluates the performance of its corridors using a variety of safety and operational metrics. Evaluation results are analyzed and used to aid the Mobility Authority in planning and implementing operational improvements as part of the Safety Management Process. The Mobility Authority is utilizing GIS to record crash data to improve analysis efforts. If an operational improvement is supported, it

3.0 Ongoing Initiatives *continued*

will be programmed and considered for funding. In some cases, further investigation is needed to facilitate an informed decision.

3.3 TECHNOLOGY INITIATIVES

The Mobility Authority is leveraging industry best practices in technology to enhance safety and operations on its roadway System.

3.3.1. INTELLIGENT TRAFFIC SYSTEMS (ITS) MASTER PLAN

The Mobility Authority has undertaken the development of a long-term Master Plan to improve and expand its Intelligent Traffic Systems on the Mobility Authority System. ITS technologies, such as CCTV cameras, Microwave and Bluetooth detectors, Connected Vehicle Roadside Units, Wrong Way Driving Systems, and Dynamic Message Signs among other technologies can improve the Mobility Authority's ability to monitor the performance of its roadways, detect and respond to incidents, and deliver important messaging to drivers. Improving the Mobility Authority's ability to perform these functions directly increases safety on the system as well as maintains performance and mobility of the roadways.

The ITS Master Plan aims to set a priority and schedule for the expansion of ITS upon the existing roadway network, as well as determine the preferred technologies to implement on the current and future projects under development. The ITS Master Plan sets a goal for the agency to establish a network of expanded CCTV video coverage (to support the implementation of Automated Incident Detection), Wrong-Way Driving Systems, Roadside Units (to support Connected Vehicle Applications), and Dynamic Message Signs. The technologies are envisioned to be implemented at strategic locations across the CTRMA system by a phased approach to first test and pilot equipment and applications for benefit before more comprehensive expansions and installations occur system-wide.

3.3.2. ITS RETROFITS AND EXPANSIONS

The Mobility Authority is initiating the first steps of the ITS Master Plan through projects to retrofit ITS equipment on the existing 183A corridor, as well as installations of additional ITS equipment on the SH 45 Southwest and 290E corridors for the purposes of pilot evaluations and testing.

The 183A ITS retrofit project will include the installation of fixed-view and pan/tilt/zoom CCTV cameras, microwave detectors, and dynamic message signs. These retrofit installations will provide much needed ITS equipment along the 183A corridor, allowing improved monitoring of the facility by the Traffic Management Center, decreased incident response times, and better messaging to drivers. The implementation of the fixed-view CCTV cameras will facilitate the pilot evaluation of automated incident detection software for potential full-scale deployment across the rest of the Mobility Authority system. Automated incident detection software can immediately detect accidents, debris, or pedestrians on the roadway utilizing artificial intelligence, and can deploy response teams and/or messaging to the roadway instantly.

ITS expansions are planned on the 290E and SH 45 Southwest projects to install Roadside Units (RSU) with Connected Vehicle applications, as well as fixed-view CCTV cameras. The RSUs will position the Authority to utilize the Connected Vehicle technologies and applications being brought to the automotive market. This technology allows communications directly to and from vehicles on the roadway, both receiving diagnostic data from vehicles, and delivering focused messages directly to vehicles on the roadway. Fixed-view cameras will support the pilot evaluations of automated incident detection software.

3.3.3. REGIONAL TECHNOLOGY CORRIDOR STRATEGY

The Mobility Authority remains an active partner in the provision of smart technology solutions being considered and delivered to the Austin region. This partnership, seeded by the USDOT Smart City Challenge,

▶ **3.0 Ongoing Initiatives** *continued*

includes the City of Austin, TxDOT, and a large team of universities, researchers and consultants all working together to deliver smart, multimodal transportation solutions to the Austin region. The Mobility Authority is involved in the project to ensure that when viable deployment and/or partnership opportunities present themselves, the agency can deliver.

The Mobility Innovation and Research Team (MIRT) continues this regional partnership to foster and develop regional ITS and technology infrastructure. This coordination and planning aim to improve mobility and performance across the region and on the Mobility Authority system.

▶ **4.0 Annual Budgets**

4.1 ANNUAL OPERATING BUDGET

Annual budgets are currently being prepared by the Mobility Authority for the proper maintenance, repair, and operation of the System for Fiscal Year 2021. 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 GECs 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, 290E, SH 71 Express, SH 45 Southwest, and the 183 South Interim Build roadways 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 2021. The budgets shown below do not include non-system costs.

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 183A Turnpike, 290E, SH 71 Express, SH 45 Southwest, and the 183 South Interim and Ultimate Build roadways. The 183 South Interim Build design/build work consists of construction of the Ultimate project configuration that begins south of the existing interchange with US 290 and continues south to approximately the Boggy Creek bridge (a distance of approximately 4.3 miles) and is anticipated to be open to traffic in late 2020. 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 a variety of factors that may influence costs during this period. The GECs estimate the FY 2021 System Operating Expenses to be \$27.2 million. The factors that determine this estimate 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, 2020.

It is the opinion of the GECs that the costs projected for the operation of 183A Turnpike, 290E, SH 71 Express, SH 45 Southwest, and the 183 South Interim and Ultimate Build are reasonable estimations of anticipated costs for the FY 2021 Annual Operating Budget.

4.2 ANNUAL MAINTENANCE BUDGET

The maintenance costs include administration costs, roadway contract maintenance activities, and other costs associated with the maintenance of 183A Turnpike, 290E, SH 71 Express, SH 45 Southwest, and the 183 South Interim and Ultimate Build. 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 2021 Maintenance Expenses to be \$10.9 million. This budget includes mobilization of the new PBMC project, asset management support, replacement of signs on 183A Phase I Turnpike, remediation costs for 290E mainlanes and the maintenance of the 183 South Interim and Ultimate project configurations. This estimated budget does not include the amount that TxDOT will reimburse the Mobility Authority for maintenance. The actual Annual Maintenance Budget will be finalized by the Mobility Authority on or before June 30, 2020.

4.0 Annual Budgets *continued*

It is the opinion of the GECs that the costs projected for the maintenance of the 183A Turnpike, 290E, SH 71 Express, SH 45 Southwest, and the 183 South Interim Build are reasonable estimations of anticipated costs for the FY 2020 Annual Maintenance Budget.

4.3 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 GECs.

The Mobility Authority is in the construction phase of the 290E Phase III Direct Connectors (DC) Project, which will provide a safe and efficient link between two heavily traveled toll facilities: the Mobility Authority's 290E Project and TxDOT's SH 130 Toll. Construction is anticipated to complete in the fall of 2021. The Mobility Authority is estimating \$37.3 million of the project cost will be spent in FY 2021, funded by the Project Fund.

The Mobility Authority is developing the 183A Turnpike Phase III Project. This 6.6-mile roadway would extend the existing 183A corridor northward from Hero Way to 1.1 miles north of SH 29 and provide two tolled lanes in each direction.

The Mobility Authority's proposed toll road would be located within the existing TxDOT and Mobility Authority right-of-way and within the median of the existing US 183 corridor. The environmental study was completed in the fall of 2019. Final design is expected to be complete in the summer of 2020. The capital expenditures for this project are estimated to be \$52 million for FY 2021 and funded by the Project Fund.

The Mobility Authority is developing the 183N Mobility Project as a design-build procurement. The project extends from State Highway (SH 45) North/Ranch-to-Market (RM) 620 to State Loop 1 (MoPac), a distance of approximately nine miles, and comprises construction of four express lanes and widening of the existing US 183 as required to bring the total number of general purpose lanes to four in each direction, with proposed express lanes located within the existing TxDOT right-of-way and within the median of the existing US 183 corridor. Project scope includes the addition of direct connector ramps providing access between the new express lanes on US 183 and the existing express lanes on MoPac, new shared-use path, new sidewalks, and cross-street connections for bicycles/pedestrians along US 183. The project received approval to environmental re-evaluation in February 2020. Proposals are due in April 2020 and construction is expected to commence in early 2021. Capital expenditures and Mobility Authority costs for this project are estimated to be \$110 million through June 2021, funded by a combination of revenue bonds and a TIFIA loan.

5.0 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.

▶ 5.0 Renewal and Replacement Fund *continued*

To finance future repairs, replacement, and rehabilitation work required on 183A Turnpike, 290E, SH 71 Express, SH 45 Southwest, and the 183 South Project, the cumulative amount in the Renewal and Replacement Fund should be sufficient to finance the next anticipated Renewal and Replacement Activities. An overlay of 183A Turnpike frontage road pavement is estimated to cost \$8.8 million and is tentatively scheduled for 2021. No Renewal and Replacement is expected to occur within the next five years on the remainder of the System.

▶ 6.0 Recommendations

6.1 OVERVIEW

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 buildings have kept the overall condition of the Mobility Authority assets in good condition. The Mobility Authority is mandated by State Law, as well as by the terms of the Master 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.

6.2 183A TURNPIKE RECOMMENDATIONS

Although minor issues were noted, the inspection conducted in fall 2019 did not identify any major deficiencies in the pavement that would affect the safety and operations of 183A Turnpike. For preventative maintenance purposes, an overlay of 183A Turnpike frontage road pavement is tentatively scheduled for 2021. This preventative maintenance supports a pavement management plan that is focused on maximizing the useful life.

Pavement markings, graphics, and raised pavement markings show areas in need of maintenance. This work is part of the PBMC scope and will be scheduled accordingly.

Signs along 183A Turnpike are beginning to show signs of fading. A contract for large sign replacement is currently in place for 183A Phase I, with construction anticipated to commence in July 2020.

Retaining walls on the 183A Turnpike corridor are in good condition. Most of the defects noted included the presence of vegetation growth causing minor drainage obstruction, minor cracking of panels, and minor spalling from precast coping. Deficiencies will be addressed as part of regularly scheduled maintenance activities.

Bridges were inspected in 2019, as part of TxDOT's BRINSAP Program. The Mobility Authority should continue to address deficiencies as part of the bridge maintenance program.

Structural inspections revealed that toll gantries and overhead sign structures were in good to excellent condition. Deficiencies will be addressed as part of regularly scheduled maintenance activities.

The 2019 visual inspection revealed that the TIM and the eight ILP enclosures on 183A Turnpike are in good condition. Deficiencies will be addressed as part of regularly scheduled maintenance activities.

Of the items inspected, the TCS infrastructure was observed to be in good to excellent condition. Efforts should be made to continue to keep all components clean, well maintained and secure for the TCS. Deficiencies will be addressed as part of regularly scheduled maintenance activities.

6.0 Recommendations *continued*

6.3 290E RECOMMENDATIONS

Multiple locations along the concrete pavement were observed to have degraded ride quality during the fall 2019 visual inspection period. In addition, bridge approach and departure transitions show signs of settlement. Continued monitoring and routine maintenance should be performed to minimize the settlement and prevent wear and tear to bridge structures. Development of a remediation plan, along with continued routine maintenance for stabilization is recommended to prevent further movement and to correct transition settlement.

In general, concrete pavement along the mainlanes was found to be in good condition. The most common deficiencies found were unsealed longitudinal cracks, rutting in asphalt pavement, and spalling at longitudinal construction joints. Deficiencies found do not fall outside of the PBMC scope and will be addressed as part of regularly scheduled maintenance activities.

Pavement markings, graphics and raised pavement markings show areas in need of maintenance. This work is part of the PBMC scope and will be scheduled accordingly.

Based on visual observations, retaining walls along the 290E corridor are in good condition. Deficiencies observed included panel spalling, minor cracks at abutment wall caps, and vegetation growth which can cause minor drain obstruction and minor panel misalignment. Deficiencies found will be addressed as part of regularly scheduled maintenance activities.

Bridges were inspected in 2019, as part of TxDOT's BRINSAP Program. The Mobility Authority should continue to address deficiencies as part of the bridge maintenance program.

Structural inspections revealed that toll gantries and overhead sign structures were in good to excellent condition. The rust stains caused by the presence of marcasite in the concrete large aggregate are limited to a cosmetic concern. Deficiencies will be addressed as part of regularly scheduled maintenance activities.

The 2019 annual inspection revealed that the three ILP enclosures on 290E are in good condition. Deficiencies found will be addressed as part of regularly scheduled maintenance activities.

Of the items inspected, the TCS infrastructure was observed to be in good to excellent condition. Efforts should be made to continue to keep all components clean, well maintained and secure for the TCS. Deficiencies will be addressed as part of regularly scheduled maintenance activities.

The inspection did not reveal any unsatisfactory deficiencies in the condition and operation of the toll gantries and sign structures. The rust stains caused by the presence of marcasite in the concrete large aggregate are limited to a cosmetic concern.

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

6.4 SH 71 EXPRESS RECOMMENDATIONS

The SH 71 Express concrete pavement sections along the corridor are in good to excellent condition. The most common deficiencies noted were edge drop-offs and rutting. In addition, there is a ride quality issue at one location across lanes in both directions where the pavement transitions from concrete to existing flexible pavement. Deficiencies will be addressed as part of regularly scheduled maintenance activities and monitored in accordance with applicable warranty specifications.

Based on visual observations, the SH 71 Express retaining walls are in excellent condition. Only a few elements were identified as minor problems, with the most common deficiency being silt build-up at drainage inlets, vegetation, and minor spalling on panel walls. Deficiencies found will be addressed as part of regularly scheduled maintenance activities.

Bridges were inspected in 2019, as part of TxDOT's BRINSAP Program. The Mobility Authority should continue to address deficiencies as part of the bridge maintenance program.

6.0 Recommendations *continued*

Structural inspections revealed that toll gantries and overhead sign structures were in good to excellent condition. Deficiencies will be addressed as part of regularly scheduled maintenance activities.

The 2019 annual inspection revealed that the TCS infrastructure, which includes an ILP enclosure on SH 71 Express, is in good condition. Efforts should be made to continue to keep all components clean, well maintained and secure for the TCS. Deficiencies found will be addressed as part of regularly scheduled maintenance activities.

6.5 SH 45 SOUTHWEST RECOMMENDATIONS

The newly constructed pavement sections along the SH 45 Southwest corridor are in excellent condition. Visual inspection did not identify any deficiencies that were outside of the PBMC scope. The most common deficiencies noted were edge drop offs at several locations. Deficiencies will be addressed as part of regularly scheduled maintenance activities and monitored in accordance with applicable warranty specifications.

Minimal deficiencies were observed on SH 45 Southwest retention ponds. The most prevalent deficiency consisted of sediment build-up in drainage structures. In addition, pond logic controllers are malfunctioning and are being addressed through construction warranty provisions.

The retaining walls on the SH 45 Southwest corridor consist primarily of MSE walls. Based on visual observations, newly constructed retaining walls on SH 45 Southwest are in excellent condition. Deficiencies noted included silt and debris in a flume, corners broken on coping at interface with a mow strip, and vegetation growth between a wall and mow strip. Deficiencies found will be addressed as part of regularly scheduled maintenance activities.

With the SH 45 Southwest corridor having just opened last summer, bridges were not inspected this 2019 cycle. Bridges will be included in the next inspection cycle anticipated for 2021 as part of the TxDOT's BRINSAP Program, which occurs every two years per federal requirements.

Structural inspections revealed that toll gantries and overhead sign structures were in good to excellent condition. Deficiencies will be addressed as part of regularly scheduled maintenance activities.

Of the items inspected, the TCS infrastructure, including the ILP enclosure and generator, was observed to be in good to excellent condition. Efforts should be made to continue to keep all components clean, well maintained and secure for the TCS. Deficiencies will be addressed as part of regularly scheduled maintenance activities.

6.6 183 SOUTH INTERIM BUILD RECOMMENDATIONS

The newly constructed concrete pavement sections along the corridor are in excellent condition with minimal deficiencies. The most common deficiencies noted consists of unsealed longitudinal cracking, as well as two locations where ride is uneven.

All newly constructed assets observed as part of the fall 2019 visual inspection are in excellent condition and will be maintained as part of the Mobility Authority's established PBMC and monitored in accordance with applicable warranty specification once the ultimate configuration reaches final acceptance. Until this time, the construction contractor will perform maintenance in accordance with the contract provisions.

The 183S Interim Build retaining walls were not inspected in this year's cycle due to construction activity in the area. The walls should be included in next year's inspection cycle.

Newly constructed bridges on 183 South Interim Build were inspected in fall of 2019 as part of TxDOT's BRINSAP Program. The findings are still being compiled and will be provided to the Mobility Authority when they are available.

Of the items inspected, the TCS infrastructure, including the 5 ILP enclosures and associated generators, were observed to be in good to excellent condition. Efforts should be made to continue to keep all components clean, well maintained and secure for the TCS. Deficiencies will be addressed as part of regularly scheduled maintenance activities.



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