



# SH 249 System Annual Inspection Report

September 1, 2021 thru August 31, 2022

Prepared by:



*State Highway 249 System  
Annual Inspection Report*

25 July 2022

Mr. Benjamin H. Asher  
TxDOT Director, Project Finance, Debt and Strategic Contracts Division  
125 East 11<sup>th</sup> Street  
Austin, TX 78701

RE: SH 249 FY 2022 System Annual Inspection Report

Dear Mr. Asher,

As the General Engineering Consultant to the SH 249 System and in accordance with Section 504 of the Master Trust Agreement dated February 1, 2019 between the Texas Transportation Commission and U.S. Bank National Association, as Trustee (the "Master Trust Agreement"); BGE, Inc. respectively submits the FY 2022 Annual Inspection Report for the SH 249 System.

As described in the requirements set forth in Section 504 of the Master Trust Agreement, the General Engineering Consultant shall make an inspection of the System, which inspection must occur at least three months prior to the end of each Fiscal Year, report their findings whether the System has been maintained in good repair, working order and condition, and present advice and recommendations, as requested by the Department, as to the proper maintenance, repair, and operation of the System during the ensuing Fiscal Year.

In conducting the visual inspection, the GEC has determined that the System is in excellent repair, working order and condition. The results of this year's inspection are indicative of the age of the project and the proactive manner in which the project is maintained.

The TxDOT Houston District Area Office has comprehensive maintenance contracts in place and are funded for routine maintenance sufficient to address non-capital deficiencies that were identified this year. This report contains a comprehensive summary of inspection results.

Sincerely,

DocuSigned by:  
*Chris Kuykendall*  
6B1226E59CA346F...

Chris Kuykendall, PE

Vice President

BGE, Inc

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## Acronyms and Abbreviations<sup>1</sup>

BGE	Brown & Gay Engineers, Inc.
CMA	Capital Maintenance Agreement
CO	Change Order
DB	Design-Build
DBA	Design-Build Agreement
DBE	Disadvantaged Business Enterprises
EJ	Engineering Judgement
FA	Final Acceptance
FHWA	Federal Highway Administration
FM	Farm to Market Road
FPAU	Financial Plan Annual Update
FY	Fiscal Year
GEC	General Engineering Consultant
HCTRA	Harris County Toll Road Authority
IQF	Independent Quality Firm
MCTRA	Montgomery County Toll Road Authority
NCR	Non-Compliance Report
NTP	Notice to Proceed
O&M	Operations and Maintenance
OV	Owner's Verification Firm
PBS	Project Baseline Schedule
PUAA	Project Utility Adjustment Agreement
QA	Quality Assurance
QC	Quality Control
ROW	Right-of-Way
SC	Substantial Completion
SH	State Highway
SI	Systems Integrator
T&R	Traffic & Revenue
TOD	(TxDOT) Toll Operations Division
TxDOT	Texas Department of Transportation
UPRR	Union Pacific Railroad
USACE	United States Corps of Engineers
US	United States Highway
WOTUS	Waters of the United States

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<sup>1</sup> Capitalized terms not otherwise defined herein have the meanings given to such terms in the Master Trust Agreement (as defined herein).

## EXECUTIVE SUMMARY

As General Engineering Consultant (GEC) to the Texas Department of Transportation (TxDOT) for the SH 249 System (SH 249 System or System); and in accordance with Section 504 of the Master Trust Agreement between the Texas Transportation Commission (the Commission) and U.S. Bank National Association, as Trustee (the Master Trust Agreement), BGE, Inc. is pleased to submit the SH 249 Annual Inspection Report for TxDOT's fiscal year (FY) ending August 31, 2022. The findings contained in this report are based upon the assessment of visual inspection data compiled for the roadway, roadside, embankment, and structural elements within the System.

This is the second annual inspection of the System since it opened to traffic with Section 1A on August 8, 2020 and Section 1B on March 26, 2021. In conducting the visual inspection, the GEC has determined that the System is in excellent repair, working order and condition. The results of this year's inspection are indicative of the age of the System and the proactive manner in which the System is maintained.

The SH 249 System elements are inspected on a monthly basis with annual inspections performed for pavement ride quality and detailed audits performed on random sections of the roadway on a bi-annual basis. It is anticipated that a majority of the deficiencies identified will be addressed within the upcoming fiscal year through either the CMA Contract or repair efforts from the TxDOT Houston and Bryan District Area Office.

The roadway system elements are inspected monthly, and during FY 2022 such inspections identified only minor issues related to edge drop offs due to edge erosion and damaged cable barrier/metal beam guard fence. These items are identified as part of the Segment 1 maintenance deficiency list provided to TxDOT and will be addressed by either the DB Contractor pursuant to the CMA Contract or by TxDOT.

The embankment system elements are inspected monthly with biennial inspections conducted specifically for the drainage system. Visual inspection of the embankments was performed with



the majority of issues relating to side slope erosion due to the sandy topsoil used for final grade and the on-going establishment of vegetative cover. The DB Contractor is addressing these issues; however, these issues will persist until the vegetation is fully established.

All bridges and bridge-class culverts within the System are to be inspected biennially and are not intended to be a part of this report. Visual inspection of the structures noted re-occurring graffiti on retaining walls and will be addressed by TxDOT's Area Office.

Based on the condition of the System, TxDOT and the DB Contractor have demonstrated a commitment to System preservation and improvement. By continually monitoring System conditions and ensuring that the System is maintained in good repair, working order and condition, TxDOT is able to provide for the safety and convenience of its patrons while maintaining a stable investment for bond holders.

#### Segment 1 Southbound Mainlanes



## INTRODUCTION

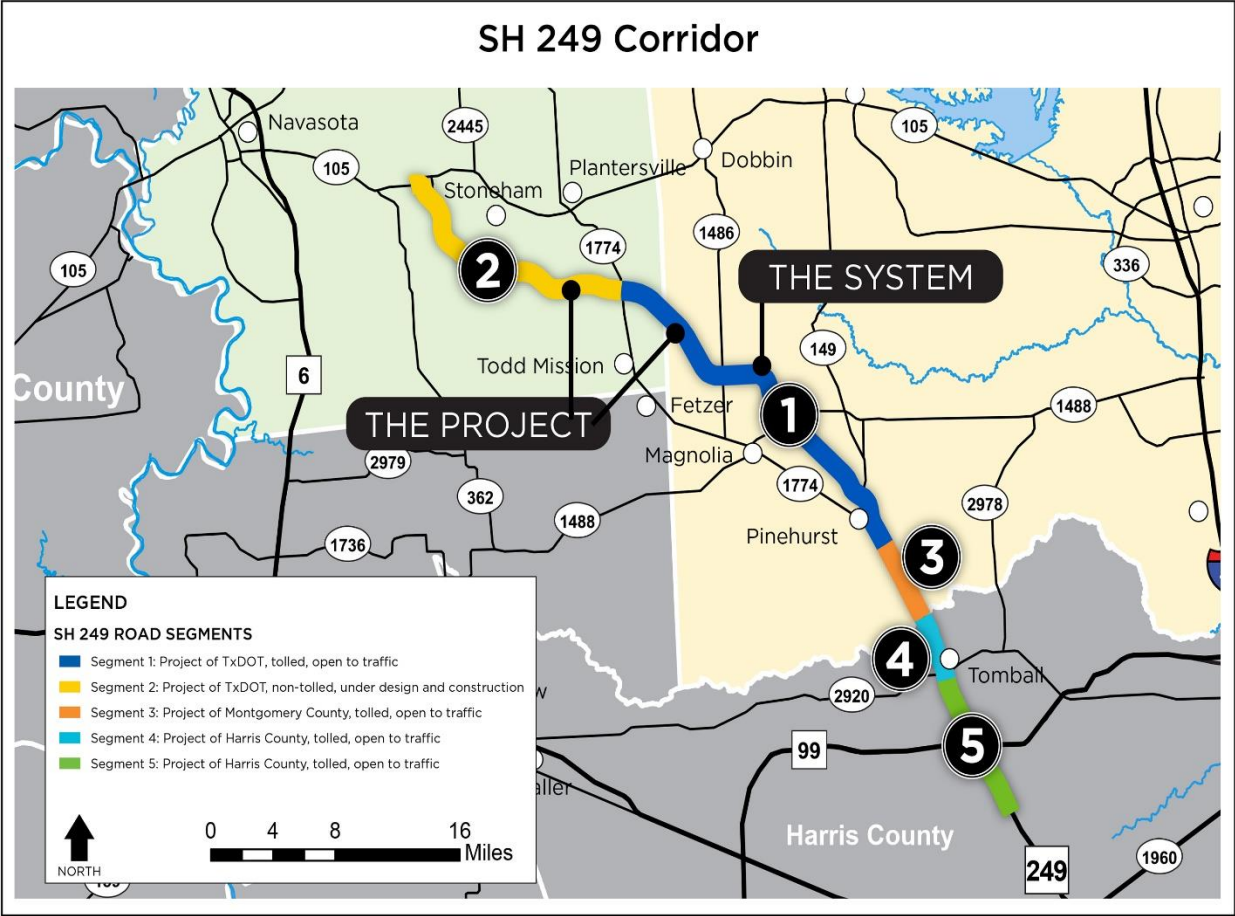
### Project Overview

The SH 249 Project (the Project) is a 25.5-mile roadway in Montgomery and Grimes Counties, located northwest of Houston, and currently being developed and constructed by or on behalf of TxDOT. The Project begins at the current terminus of State Highway (SH) 249 frontage roads at Farm to Market (FM) 1774 in Pinehurst, Texas (Montgomery County) and extends to SH 105 near Navasota, Texas (Grimes County). The Project consists: of (a) 14.8 miles of four new toll lanes from FM 1774 in Pinehurst to FM 1774 near Todd Mission, Texas (Segment 1 or the System); and (b) an additional 10.7 miles of two non-tolled lanes from FM 1774 near Todd Mission to SH 105 near Navasota (Segment 2) which is not part of the System established pursuant to the Master Trust Agreement between the Texas Transportation Commission (the Commission) and U.S. Bank National Association, as Trustee (the Master Trust Agreement). The System is further divided into two Sections comprising of: Section 1A from FM 1774 in Pinehurst to FM 1488, a distance of 6.4 miles; and Section 1B from FM 1488 to FM 1774 near Todd Mission, a distance of 8.4 miles.

The System (Segment 1) is fully opened to traffic and collecting tolls. Section 1A opened to traffic ahead of schedule on August 8, 2020 and Section 1B opened to traffic on March 26, 2021. Segment 2 is scheduled to be open to traffic on schedule on or before June 5, 2023 and is not covered by the scope of this report.



Figure 1: Project Location Map



## MAINTENANCE

Maintenance responsibilities for the SH 249 System are shared between TxDOT and the DB Contractor pursuant to a Capital Maintenance Agreement (CMA). The CMA Notice to Proceed (NTP) to the DB Contractor was issued on August 22, 2019 and the initial five-year CMA period for the Project began on August 8, 2020 with the Substantial Completion (SC) and opening of Section 1A to traffic.

Maintenance is performed within the SH 249 right of way for the mainlanes, frontage roads, ramps, and cross streets in both the Houston and Bryan Districts as shown in Table 1.

Table 1: SH 249 Maintenance Limits Summary

	Houston District		Bryan District	Total
	Section 1A Lane-Miles	Section 1B Lane-Miles	Section 1B Lane-Miles	
Mainlanes	25.6	24.7	7.3	57.6
Frontage Roads	10.7	0.8	0.0	11.5
Ramps	3.6	1.2	1.5	6.3
Cross-streets	4.1	1.0	0.6	5.8
	44.0	27.7	9.5	81.2

Note: Totals may not sum due to rounding.

As part of the CMA, the DB Contractor developed procedures in their Maintenance Management Plan (MMP) to inspect elements and repair deficiencies. Joint maintenance inspections were carried out by the DB Contractor and the GEC during FY 2022 and included monthly general inspections and bi-annual audit inspections of Segment 1.

### Maintenance Responsibilities of the DB Contractor

For the duration of the maintenance term, the DB Contractor is responsible for maintenance services within the maintenance limits for the defined elements (the “maintained elements”) per the responsibility matrix included within the CMA. A summary of the maintained elements by the

DB Contractor as required by the CMA are: pavement and pavement subgrades, drainage features, earthwork/embankments, and structures (bridges, culverts, and walls).

The DB Contractor must remedy and repair deficiencies within the System, other than the elements TxDOT or others are responsible for maintaining, including renewal or rehabilitation work not scheduled in the DB Contractor's planned annually recurring highway maintenance and repair program, as necessary to meet the performance specification requirements of the CMA. Where TxDOT, other governmental entities, or the Systems Integrator (SI) have maintenance responsibilities within the maintenance limits or on adjacent facilities, the DB Contractor is required to coordinate its traffic management plan to minimize disruption to the roadway users.

A warranty term for each Section or Segment of the Project will commence upon SC of each respective Section or Segment and remain in effect until one year after Final Acceptance. During the period of the initial maintenance term in which the construction warranties under the DBA are in effect, the DB Contractor is required to correct, at its own expense, any failures of any of the DB Contractor's work with applicable warranties. The Section 1A warranty term is expired and the Section 1B warranty term will expire on July 21, 2022.

The DB Contractor is required, per the CMA, to avoid any adverse impact on the Electronic Toll Collection System (ETCS) wherever possible as to not cause any loss of toll revenue to TxDOT. If the DB Contractor plans to undertake maintenance services that potentially affects the ETCS equipment or vehicle movements on main lanes or ramps, the DB Contractor is required to inform TxDOT and TxDOT's Statewide SI. When adverse impact on ETCS equipment because of maintenance services is unavoidable, the DB Contractor is required to prepare and submit an ETCS impact mitigation plan of the planned maintenance services for TxDOT's approval that identifies the nature and duration of the potential impacts and associated proposed mitigation measures.

### **Maintenance Responsibilities of TxDOT**

TxDOT, or other applicable third-party entities engaged by TxDOT, retains the routine maintenance responsibilities for those items the DB Contractor is not required to maintain per the CMA

documents (the “non-maintained elements”). A summary of the major elements to be maintained by TxDOT as required by the CMA are pavement markings, safety attenuators, traffic signs, traffic signals, illumination, sound/noise walls, roadside elements (mowing, litter pickup, vegetation/landscaping, etc.), ITS equipment, tolling facilities and equipment (by TxDOT TOD/System Integrator), and roadway sweeping and cleaning when the System is in the full O&M phase.

TxDOT will provide the response to incidents and customer inquiries, perform preventive and routine maintenance as necessary, and provide for the clearance of snow and ice accumulations as required within the maintenance limits in accordance with TxDOT’s Snow and Ice Control Operations Manual.

### **Maintenance Inspections**

During the second year of the initial five-year CMA period, routine inspections were conducted monthly by the DB Contractor and the GEC. Furthermore, the roadway is monitored by TxDOT staff via closed circuit television (CCTV) cameras to identify trash and roadway hazards which impact toll operations and inspected by the Area Office on an ad hoc basis. All identified deficiencies by the maintenance inspection efforts are transmitted to the responsible party, either the DB Contractor or TxDOT, based on the CMA contract. As such, if the TxDOT Area Office notices a defect which falls under the DB Contractor’s responsibility, then TxDOT notifies the DB Contractor who then issues a work order via their Maintenance Management Information System (MMIS) which is automatically transmitted to their O&M team for repair and tracking. If the repair is not addressed and closed within the prescribed period, then TxDOT and the GEC are notified for further action. If the deficiencies are not corrected in a timely manner, TxDOT has contractual remedies available to collect financial damages related to delays per the CMA.



Segment 1 Northbound Mainlanes





## ANNUAL INSPECTION AND FINDINGS

As described in the requirements set forth in Section 504 of the Master Trust Agreement, the GEC shall make an inspection of the System, which inspection must occur at least three (3) months prior to the end of each Fiscal Year, report their findings whether the System has been maintained in good repair, working order and condition, and present advice and recommendations, as requested by TxDOT, as to the proper maintenance, repair, and operation of the System during the ensuing Fiscal Year.

In compliance with Section 504 of the Master Trust Agreement, the GEC employed under provisions of Section 704(a) thereof performed an annual inspection of the System in the week of April 4-8, 2022, more than three months prior to the end of the Texas Transportation Commission's (the Commission) Fiscal Year.

The inspection crew performed general visual inspections of the System and categorized the results into four subsystems: roadway, roadside, embankment, and structural elements. These inspections were made for the purpose of evaluating the general condition of the System's assets and identifying maintenance efforts to address the deficiencies noted during the inspections. The degree of inspection for this report consists of general visual observations and is not based on detailed testing.

The opinions, statements, and recommendations in this report are based solely on conditions revealed by these inspections during the inspection period. No representation or warranty is made that all deficiencies have been discovered or that deficiencies will not later appear.

### Roadway

Inspection of the roadway consisted of the general conditions of the pavement including: the mainlanes, shoulders, ramps, and cross-streets; condition of the curbs & gutters for cracking or settlement; condition of the joints for cracking or cleaning; inspection of the pavement markings for missing marker/buttons and wear; and the rigid and flexible barrier for damage or missing reflectors. The SH 249 System is a new facility and the roadway elements remain in excellent

condition. The roadway inspection identified several deficiencies of edge drop offs and damaged cable barrier/metal beam guard fence. These deficiencies were reported to the DB Contractor and TxDOT Area Office for repair and are delineated with traffic cones for safety. The roadway inspection additionally identified a dip in the pavement along the northbound mainlanes south of the Future Terra bridge that will require renewal work to correct.

### Edge Drop-Off



### Roadside

Inspection of the roadside elements consisted of the general condition of: large guide signs and small roadside signs for damage, retro-reflectivity and wear; noise walls for damage; illumination for damaged poles; the ITS system for damaged poles or cabinets; and establishment and management of ground cover. The SH 249 System is a new facility and the roadside elements remain in excellent condition. Two deficiencies were identified with both issues relating to signs.

#### Missing SH 249 Trailblazer Sign



#### Embankments

Inspection of the embankment elements consisted of the general condition of the side slopes to ensure no erosion or slope failure; drainage ditches for debris and ponding; drainage culverts for siltation and/or debris blockage; and inlets to ensure that they are operating as intended. The SH 249 System is a new facility and the embankment elements are in good condition. Nineteen embankment deficiencies were identified with the majority being issues with side slope erosion due to the sandy topsoil used for final grade and the on-going establishment of vegetative cover.



### Embankment Failure and Siltation at Culvert



### Structures

Inspection of the structures consisted of the general condition of the bridges and retaining walls for damage and wear. The SH 249 System is a new facility and the structural elements remain in excellent condition. One deficiency was identified as reoccurring graffiti on retaining walls.

#### Section 1A: Bridge BR1A-04 Abutment Wall with Reoccurring Graffiti



## 2022 ANNUAL INSPECTION RECOMMENDATIONS

The GEC visually inspected the System to ensure that the System is safe and being well maintained by both TxDOT and the DB Contractor. The full inspection findings and photos were provided to the TxDOT Project Manager.

Based upon the annual visual inspections and the asset condition assessment from the DB Contractor's audit, recommendations are developed to maintain the overall condition rating of the System. Continued efforts by TxDOT and the DB Contractor maintenance personnel to identify, repair and maintain the roadways, structures, roadside appurtenances, and embankments have had a positive effect on the overall condition of the System.

In conducting the visual inspection, the GEC has determined that the System is in excellent repair, working order and condition. The results of this year's inspection are indicative of the age of the System and the proactive manner in which the System is maintained.

BGE Inc., as the GEC, recommends that TxDOT and the DB Contractor continue to carry out the current Maintenance Management Plan (MMP) and follow the current procedures to ensure the long-term operational success of the System. The inspection from the GEC finds that the System is being maintained in accordance with normal TxDOT highway facilities. No safety or structural defects were noted, and only minor repairs largely linked to erosion control and vegetation establishment are required. Specific recommendations based on the 2022 annual visual inspections are listed below for immediate corrective action or new maintenance efforts for implementation in FY 2023.

### Roadway

Recommendation 1: Edge Drop Off – the inspection identified areas of edge drop off from 3-inches to 5-inches due to erosion. The GEC recommends that DB Contractor continue to perform slope repair remedies using block sod or soil with a high organic material content that will both resist erosion and promote dense vegetative cover.



Recommendation 2: Dip in Pavement – The inspection noted a settlement in the outside lane of the northbound mainlane pavement just south of the Future Terra Bridge. The GEC recommends that DB Contractor perform renewal work to correct the pavement using a deep Injection process of expansive polyurethane material to stabilize the soil under the roadway and create lift to restore the pavement to the original grade.

#### Section 1A Pavement Dip South of Future Terra Northbound Bridge



#### Embankments

Recommendation 3: Erosion Repair – many areas along the SH 249 corridor have experienced slope and ditch erosion mostly due to balding patches of vegetation cover which is causing downstream siltation, undercutting, and slope failure. The GEC recommends that DB Contractor continue to

perform slope repair remedies, including the reestablishment of ditch flowlines, using block sod or backfill soil with a high organic material content that will both resist erosion and promote dense vegetative cover.

## ANNUAL BUDGET

Pursuant to Section 505 of the Master Trust Agreement, the Commission is required to adopt its annual budget for the System (Annual Budget) for FY 2023 by September 1, 2022, which budget includes the period from February 26, 2019 through August 31, 2023. The Annual Budget, which is based on estimated cost projections, together with factors that may influence costs during this period, will be reviewed by the GEC prior to adoption by the Commission. The Annual Budget should consider the recommended maintenance and repairs noted above and should be based on current operating practices.

The maintenance costs include the CMA cost, TxDOT contract maintenance activities, administration costs, and operational costs for the maintenance of the System. The estimated costs for the proper maintenance and repair of the System for the year is based on a review of existing and future conditions, together with the factors that may influence costs during this period. The GEC estimates the total FY 2022 Operations and Maintenance (O&M) Budget to be \$2.2 million and projects the upcoming FY 2023 O&M Budget to be \$4.6 million. The FY 2023 O&M Budget is greater than the \$2.5 million estimated FY 2023 O&M Budget reported in last year's Annual Inspection Report. This increase is due to aggregating TxDOT administrative costs with the routine maintenance cost to ensure federal compliancy with Title 23 United States Code Section 129. In addition, the GEC administrative costs decreased from last year's estimated costs due to the breakout and removal of Segment 2 GEC costs. It is the opinion of the GEC that the costs projected for the operations and maintenance of the System are reasonable estimations of anticipated costs for FY 2023.

Beginning with the FY 2023 Annual Budget adopted by the Commission by September 1, 2022, the Commission has covenanted in Section 505 of the Master Trust Agreement to include in the Annual Budget details of the Commission's planned Major Maintenance Expenditures and capital expenditures for an additional four (4) FYs beyond the beginning Fiscal Year for a total of five (5) FYs and the portion of capital expenditures expected to be funded from the Major Maintenance Account.

The Commission has covenanted in Section 513 of the Master Trust Agreement to pay Segment 1 O&M Expenses to the extent Revenues are not sufficient for such purpose from lawfully available funds. Additionally, Section 507 of the Master Trust Agreement provides that any Revenues remaining, after funds are allocated to System debt service and debt service reserves, will be deposited to the Rate Stabilization Fund until a total of \$20,000,000 has been transferred.

Table 2: 5-Year Budget Forecast

5 YEAR SH 249 SEGMENT 1 OPERATIONS & MAINTENANCE BUDGET FORECAST					
FISCAL YEAR	CMA and TxDOT Maintenance/Admin		Admin	Operating	TOTAL OPERATIONS AND MAINTENANCE BUDGET
	ANNUAL CMA TOTAL <sup>1</sup>	TXDOT <sup>2</sup>	GEC	TOD <sup>3</sup>	
2022	\$893,975	\$691,701	\$538,707	\$100,209	\$2,224,592
2023	\$970,640	\$2,962,341	\$466,021	\$242,118	\$4,641,121
2024	\$1,019,172	\$3,010,873	\$429,679	\$254,224	\$4,713,948
2025	\$1,070,131	\$3,161,832	\$446,840	\$266,936	\$4,945,739
2026	\$1,728,909	\$3,970,610	\$469,182	\$280,282	\$6,448,983
2027	\$1,815,354	\$4,157,055	\$492,642	\$269,771	\$6,734,823
<b>5 YEAR SUBTOTAL</b>	<b>\$6,604,206</b>	<b>\$17,262,711</b>	<b>\$2,304,365</b>	<b>\$1,313,331</b>	<b>\$27,484,614</b>

Notes

<sup>1</sup> DB Contractor's Annual maintenance costs to be updated annually based on the escalation clauses in the CMA 3 months prior to end of each maintenance year. Escalation is estimated for FY 2024 to FY 2027.

<sup>2</sup> TxDOT costs includes Utility cost, Montgomery Area Office routine maintenance cost, Salaries, ITS/Signal/Illumination Maintenance cost, and Major Maintenance Expenditure costs.

<sup>3</sup> TOD Operating Budget based on TxDOT's System Integrator Maintenance Contract estimate per tolling lane.