



# SH 249 System Annual Inspection Report

September 1, 2020 thru August 31, 2021

Prepared by:



*State Highway 249 System  
Annual Inspection Report*

22 July 2021

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 2021 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 2021 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

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
UAAA	Utility Adjustment Agreement Amendment
UPRR	Union Pacific Railroad
USACE	United States Corps of Engineers
US	United States Highway
WOTUS	Waters of the United States

## 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, 2021. 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 first 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 considering that the work in Section 1B has yet to reach Final Acceptance. 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 roadway system elements are inspected on a monthly basis with annual inspections performed for pavement ride quality. Damaged cable barrier is noted as the primary deficiency followed by minor spalling in the roadway. 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 District Area Office.

The roadway system elements are inspected monthly with only minor issues noted related to Section 1B trailblazer signs not oriented correctly. These items are identified as part of the Section 1B punch list and will be addressed by the DB Contractor prior to Final Acceptance of the work.

The embankment system elements are inspected monthly with biennial inspections conducted specifically for the drainage system. The first biennial inspection is scheduled for FY 2022. The drainage system in Section 1B is currently burdened with deficiencies such as silting in the culverts and flumes. This is expected as the vegetation has yet to be fully established and will be addressed



by the DB Contractor when the vegetation has matured. Visual inspection of the embankments was performed with side slope washouts and rivulets as the primary deficiency. The DB Contractor is addressing these issues; however, this 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 deficiencies mostly within Section 1B which primarily include painting, patching bolt holes, and general cleanup; these items are identified as part of the Section 1B punch list and will be addressed by the DB Contractor prior to Final Acceptance of the work.

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 Mainlane Gantries



## INTRODUCTION

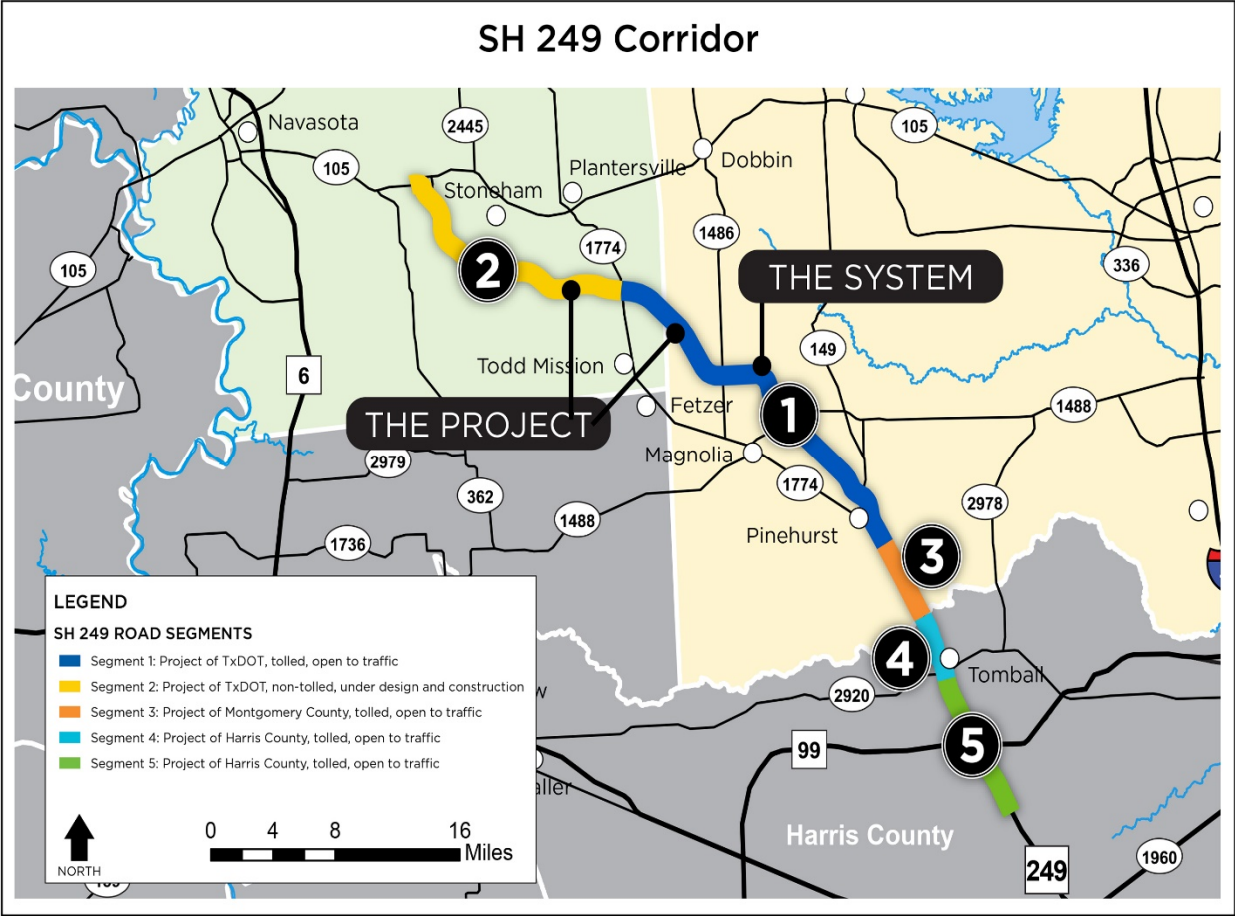
### Project Overview

The SH 249 Project (the Project) is a 25.5-mile new-location 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.

As Segment 2 construction is completed, it will be added to this initial five-year maintenance period. Design-build and CMA activities will continue concurrently until the SC of Segment 2, at which point the entire Project will be in the O&M phase.

As part of the CMA, the DB Contractor has developed procedures in their Maintenance Management Plan (MMP) to inspect elements and repair deficiencies. Maintenance inspections carried out by the DB Contractor during FY 2021 included monthly general inspection and an audit inspection of Section 1A as witnessed by the GEC and TxDOT. Furthermore, the GEC conducts its own monthly inspection to capture maintenance deficiencies.

### **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 specifications included with 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, for any failures of any of the work with applicable warranties, the DB Contractor is required to correct that work at its own expense. When instructed by TxDOT, the DB Contractor must repair any damage to elements maintained by the DB Contractor caused by an incident or emergency.

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), and sweeping and cleaning when the System is in the full O&M phase.

TxDOT will provide the response to incidents and customer inquiries and perform preventive actions and the clearance of snow and ice accumulations within the maintenance limits generally in accordance with TxDOT's Snow and Ice Control Operations manual.

## **Maintenance Inspections**

During the term of the CMA, routine inspections are 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 hazard 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 Maintenance office notices a defect which falls under the DB Contractor's responsibility, then TxDOT notifies the DB Contractor who then completes an automated report which is automatically sent 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. TxDOT and the GEC will then work with the DB Contractor to ensure the deficiency is corrected, and if not, TxDOT has the contractual remedies available to collect financial damages related to delays per the CMA.

### **Segment 1 Mainlanes**





## ANNUAL INSPECTION AND FINDINGS

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 (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 the Department, 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 General Engineering Consultant (GEC) employed under provisions of Section 704(a) made an annual inspection of the System in the week of May 2-8, 2021, more than three months prior to the end of the Texas Transportation Commission's (the Commission) Fiscal Year. As expected, a large number of deficiencies were identified within Section 1B as this section has not reached Final Acceptance.

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



elements. The SH 249 System is a new facility and the roadway elements remain in excellent condition. The roadway inspection identified several deficiencies of damaged cable barrier/MBGF. These deficiencies were reported to the TxDOT Area Office for repair and are currently delineated with traffic cones for safety. The roadway inspection also identified areas along the Section 1B mainlane pavement at construction entrances/exits that were in need sweeping and locations on the shoulder that had minor pavement spalls.

#### Section 1A Damaged Cable Barrier south of FM 1774



#### Roadside

Inspection of the roadside elements consisted of the general condition of: the 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. Twenty-two deficiencies were identified with the majority being areas that need mowing, areas that need established vegetation (seeding), and small signs deficiencies.

### Section 1A FM 149 Object Marker Small Sign Damage



### 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. Ninety-one deficiencies were identified with the majority being issues with side slope erosion, culvert siltation, cleaning and repairing SWPPP devices, and ditch ponding. The majority of these deficiencies are located in Section 1B and were included on the punch list for corrective action prior to Final Acceptance of the Work and are dependent on establishing proper vegetative cover.



### Section 1B FM 1486 Retaining Wall Embankment Erosion and Flume Silting



### 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. Twenty-six deficiencies were identified with the majority located in Section 1B concerning general cleanup around and under the structures, patching the column bolt holes used for erection, patching the retaining wall coping, cleaning the flume, and sub-structure painting.

### Section 1B FM 1486 Bridge Column with Unpatched Bolt Holes



## 2021 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 2021 annual visual inspections are listed below for immediate corrective action or new maintenance efforts for implementation in FY 2022.

### **Roadway**

Recommendation 1: Elimination of water on Roadways – the inspection identified water ponding on the shoulders and mainlanes that is either overflowing from drainage ditches or seeping from the embankments and retaining walls adjacent to the roadways. This water and the underlying causes for the ponding must be eliminated for safety purposes as well as to prevent deterioration of the embankment and pavement. These deficiencies are located within Section 1B and were

added to the punch list for Final Acceptance. The DB Contractor was notified to determine the cause of water seepage that flows onto the mainlanes at Ramps E, J, and L and prepare plans and specifications to repair.

#### Section 1B Ramp E Ponding



Recommendation 2: Joint and Crack Sealing – The inspection noted joint wear along the northbound frontage road at Future Terra Blvd at the asphalt and concrete pavement interface. The GEC recommends that joint and crack sealing is performed on a yearly basis to repair new and existing cracks and joints as needed to maximize performance of the pavement.

#### Section 1A Joint Wear at Future Terra Blvd.





## Embankments

Recommendation 3: Erosion Repair – many areas along the SH 249 corridor have experienced shoulder or slope erosion causing rivulets and siltation in the drainage system. Several factors such as lack of vegetation growth, bridge drains without splash protection and large vehicles overshooting their wheel path are contributing to the erosion problems at the interchange. The GEC recommends that DB Contractor continue to provide and maintain silt fence and perform slope repair remedies; however, a permanent fix will not be feasible until the vegetative cover is fully established.

### Section 1B Erosion and Washout at Safety End Treatment



## ANNUAL BUDGET

Pursuant to Section 505 of the Master Trust Agreement, the Commission shall only be required to adopt its first Annual budget for the System (Annual Budget) by September 1, 2022. 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 coming 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 2021 Operations and Maintenance Budget to be \$2.6 million. 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 2021.

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 detail of the Commission's planned Major Maintenance Expenditures (as defined in the Master Trust Agreement) and capital expenditures for an additional four (4) FYs beyond the then 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 (as defined in the Master Trust Agreement).

The Commission has covenanted in Section 513 of the Master Trust Agreement to pay Segment 1 O&M Expenses to the extent Revenues (as defined in the Master Trust Agreement) are not sufficient for such purpose from lawfully available funds. Additionally, Section 507 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 1: 5-Year Budget Forecast

5 YEAR SH 249 SEGMENT 1 OPERATIONS & MAINTENANCE BUDGET FORECAST							
FISCAL YEAR	CMA and TxDOT Maintenance				Admin	Operating	TOTAL OPERATIONS AND MAINTENANCE BUDGET
	CMA (Exhibit 4C)			TXDOT	GEC	TOD <sup>2</sup>	
	ANNUAL ROUTINE MAINTENANCE	ANNUAL RENEWAL WORK	ANNUAL CMA TOTAL				
2022	\$814,529 <sup>1</sup>	\$0.00	\$814,529	\$662,400	\$1,086,773	\$100,209	\$2,663,911
2023	\$814,529 <sup>1</sup>	\$0.00	\$814,529	\$662,400	\$1,396,529	\$103,215	\$2,976,673
2024	\$814,529 <sup>1</sup>	\$0.00	\$814,529	\$662,400	\$1,396,529	\$106,311	\$2,979,770
2025	\$814,529 <sup>1</sup>	\$0.00	\$814,529	\$662,400	\$635,072	\$109,501	\$2,221,503
2026	\$881,207 <sup>1</sup>	\$430,164	\$1,311,371	\$772,800	\$635,072	\$109,501	\$2,828,744
5 YEAR SUBTOTAL	\$4,139,323	\$430,164	\$4,569,487	\$3,422,400	\$5,149,978	\$528,737	\$13,670,601

Notes

<sup>1</sup> Annual Routine Maintenance costs to be updated annually based on the escalation clauses in the CMA 3 months prior to end of each maintenance year.

<sup>2</sup> TOD Operating Budget based on TxDOT's System Integrator Maintenance Contract estimate per tolling lane.