

## Access Control and CCTV Requirements

Access Control and CCTV Requirements (Section AC)	
Req ID	
	<b>Access Control Requirements</b>
AC-001	The Toll System Provider shall provide an access control system for all the Roadside System cabinets provided by the Toll System Provider. The access control system shall be a card system that provides restricted access for the Toll System Provider staff. The Joint Board staff shall be provided 10 cards for access, but Toll System Provider is anticipated to be the only entity that will access the Roadside System cabinets.
AC-002	The Toll System Provider shall provide setup, install and configure a CCTV pan title zoom camera and all data communications to monitor the equipment cabinets. The Toll System Provider shall trigger CCTV events for recording and pre-sets to position camera at the point of alarm.
AC-003	The Toll System Provider shall track data and provide reports showing entry and exit times for facilities, secure areas, toll equipment and other devices requiring secure access. If a door is not closed within a preset time (configurable) an alarm shall be generated by the access control system.
AC-004	The Toll System Provider shall provide an Access Control System with the capability for authorized users to manage user roles, including but not limited to: create new roles, assign and un-assign users to roles, adjust roles, deactivate roles; and, in general, control all rights within the System through the assignment of user roles.
AC-005	The Toll System Provider shall utilize an existing Access Control System for the CSC with additional staff or roles added for the Project. The Toll System Provider shall have an Access Control System for the Walk-up Centers that provides for key or access card access to the Walk-up Centers. The Toll System Provider shall make available Access Control System audit reports on-demand, including but not limited to: 1) logged activity by activity type; 2) logged activity by user accounts; and 3) logged activity by user.
	<b>CCTV</b>
AC-006	The CCTV roadway cameras shall be used for observation, to audit traffic as it passes the Roadside System, and to monitor Toll Zones and toll equipment sites for security purposes.
AC-007	CCTV video shall have the following Transaction data correlated to the video: 1) The live feed of the CCTV roadway camera shall be available to the CSC; 2) The Transactions shall be indexed to the roadway overview camera for auditing; 3) The CCTV roadway overview cameras and recordings shall require separate identification and password authentication requirements from those of the CCTV site security cameras and recordings, and 4) CCTV video shall include timestamp common to the time base of the TCS.
AC-009	Fixed (not Pan-Tilt-Zoom) CCTV cameras shall provide full coverage for observation of all traffic lanes in each Toll Zone. Pan-Tilt-Zoom CCTV cameras shall be mounted in such locations that the full Toll Zone and toll equipment is visible by the CCTV camera. All CCTV cameras for roadway overview and site security shall record to a digital video recorder for motion video storage. The CCTV cameras shall record periods of inactivity at lower frame rates or resolution than the normal settings, and shall have a viewable image on a 24 hour per day, 7 day per week basis. The CCTV camera shall provide a continuous capture of the tuned field of view.
AC-010	The CCTV cameras provided by the Toll System Provider shall be color digital cameras supporting a minimum resolution of 720 vertical lines. The CCTV camera shall be a proven commercial product with a second source that can be expanded or updated, in a modular fashion, over time, applicable to both Hardware and Software without modification to any portion of the TCS. The CCTV camera shall provide clear video in both normal day and night conditions, and adjust for poor light conditions.
AC-011	CCTV cameras and all of the associated electronic equipment shall be housed in a weatherproof NEMA rated enclosure and be protected against vandalism and mounted out of physical reach.
AC-012	The CCTV camera and associated digital video recorder (DVR) shall include an administrative application at the toll facility host which shall enable authorized managers to determine access authorizations and CCTV settings. The CCTV system shall configure the CCTV network recordings, data, all other network settings, and events based on motion detection in the field of view or other event triggering, for a configurable number of seconds before and after the event, and shall allow playback, such that configurable specific fields of data are only visible by specific categories of users.
AC-013	The CCTV camera DVR and associated Hardware shall be time synchronized with the TCS and CCTV cameras, and applications shall remain in operation and continue recording when the communications fail, such as a failure of any Roadside System equipment.

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AC-014	CCTV Cameras shall detect movement for specific zones near cabinets or building doors. CCTV cameras have the capability to be aimed in any of 360 degrees of direction and 180 degrees of tilt, with a zoom capability of ten times.
AC-015	The Toll System Provider shall provide a digital video recorder to record the CCTV camera video. Authorized users shall access and query the DVR to search video by date, time and location.
AC-016	The DVR shall be configurable to provide a range of recording frames per second and shall be write-protected to prevent anyone from altering the recording. All video recordings shall be accessed within two (2) seconds of a request to review the video and the DVR shall store sixty (60) days of recording on the DVR and be configurable between one (1) and sixty (60) days.
AC-017	Authorized users on the TCS network shall be able to access, open and display cameras on a personal computer through a DVR application provided by the Toll System Provider. The Toll System Provider shall provide VPN access for users to remotely access the TCS network. The authorized user shall access the DVR through the network to play back previously recorded video with selected lane activity data for review. Note: It is expected that the Toll Operations Center staff and the Joint Board will be the primary users of these videos.
AC-018	The DVR shall enable an authorized user to copy, save, and print segments of recorded data as images or full-motion video and to crop and alter those copies if necessary without altering the original. The DVR recordings shall all be in one industry standard open format for recording and displaying live streaming video and full-file downloads. The DVR shall automatically purge CCTV data not marked for archive after a configurable period of time, with the default set at 60 calendar days. The DVR shall provide the ability to automatically archive alarm events and other designated critical events regardless of purge cycle.
AC-019	Toll System Provider shall provide CCTV and DVR report(s) that include but are not limited to the following information: 1) user access to the CCTV camera system including date and time stamp and camera name; 2) firmware version and date, and 3) camera and DVR configuration. It is expected that these reports are commercially available from these devices.
AC-021	The Toll System Provider shall provide CCTV maintenance to satisfy Mean Time Between Failures(MTBF) – of 10,000 hours based on continuous operations of 24 hours a day 7 days a week usage.
AC-022	The CCTV system shall be sized such that a minimum of ten (10) concurrent users may use the system without degradation of the system.

## TCS Workflows

Work Flows (Section WF)	
Req ID	
WF-001	<p><b>Transaction payment processing and settlement</b> The Toll System Provider shall provide system functionality and operations processes to process Transaction payments and settlements on all account types. Note: The system and operations work flows shall also demonstrate traceability of Traffic Transactions and Financial Transactions within the System from the Roadside System into the BOS.</p>
WF-002	<p><b>Transaction payment processing and settlement</b> The Toll System Provider shall provide system functionality and operations processes to process Transaction payments and settlements on all account types. Note: Transactions are paid from the account and settled with home or away agencies as paid, closed or escalated for further notice of payment required.</p>
WF-003	<p><b>Account management system functions (open, close, update accounts)</b> The TCS shall provide account management system functions and operational processes for Traffic Transactions received from the Roadside System and sent to an account for payment.</p>
WF-004	<p><b>Customer service representative customer interactions</b> The TCS shall provide functional customer interfaces that include updates to the account, maintenance of the account or handling of special cases such as habitual violators or other special circumstances.</p>
WF-005	<p><b>Image Review</b> The TCS shall provide System functionality and operations processes to process images in Traffic Transactions and post the Transaction to the BOS prior to the issuing of Customer Statements.</p>
WF-006	<p><b>Invoice generation and escalation</b> The TCS shall provide system functions and operations processes for Registered or Unregistered Video accounts. The TCS shall send individual Transactions on an invoice or bundle Transactions into an invoice.</p>
WF-007	<p><b>Violations processing (post-paid no payment)</b> The TCS shall provide system functionality and operations processes for Customer Statements after unsuccessful collection through the invoice notices for video account customers or now invalid ETC Account customers. Note: The Toll System Provider is responsible for the evidentiary package for the administrative hearing process and court process on the LSIORB Project.</p>
WF-008	<p><b>Incoming payments at the Walk-up Center – Credit, Check, Cash</b> The TCS shall provide system functionality and operational processes to accept credit cards, checks, and cash at the Walk-up Centers.</p>
WF-009	<p><b>Payment Processing (including lockbox, reversals, payment plans, refunds or mitigated deals)</b> The TCS shall provide system functionality and operational processes to accept, process and settle lockbox payments, issue refunds, reverse Transactions and fees and perform mitigated deals for a customer on all account types.</p>
WF-010	<p><b>Collection agency and court interfaces</b> The TCS shall provide system functions and operational processes for use of internal collections process or external collection agency and court processes after failure to collect funds from invoice, Violation, and collection notice process.</p>
WF-011	<p><b>Customer self-service payments including cash replenishments</b> The TCS shall provide system functionality and operational processes for self-service channels such as an IVR system, Customer Website, and mobile payments or other means to provide a low cost and convenient method for receiving and processing customer payments.</p>

<b>Work Flows (Section WF)</b>	
<b>Req ID</b>	
WF-012	<p><b>Financial Reconciliation within TCS and with external accounting system</b>            The TCS shall provide system functionality and operational processes to process Financial Transactions that account for all payments made from the customer to the TCS, external agencies and/or customer interfaces (such as kiosks or retail outlet) or money received from other agencies for Project account holders. Note: An accounting system (e.g. general ledger) will be provided by others. The Toll System Provider shall interface with the third-party-provided accounting system and reconcile all Financial Transactions and Traffic Transactions collected and processed by the TCS.</p>
WF-013	<p><b>TCS incident management</b>            The TCS shall provide System functionality and operations processes to create, manage, and dispose of incidents within the TCS (e.g. Roadside System, BOS and TOC). Note: These work flows shall address how priority levels are established in the System, how work tickets are created and how dispatchers will be notified, take action and resolve the incident. This is classically the incident management component of a Maintenance Online Management System (MOMS) and shall include the functions of the Toll Operations Center responsible for managing these incidents.</p>
WF-014	<p><b>TCS monitoring</b>            The Toll System Provider shall provide system functionality and operations processes that provide Hardware, Software and System alarm generation, priority levels assignments and final disposition. Note: This is typically the System monitoring component of a Maintenance Online Management System (MOMS) and shall include the functions of the Toll Operations Center responsible for managing these incidents.</p>
WF-015	<p><b>TCS inter-agency Transaction processing and settlement</b>            The TCS shall provide system functionality and operations processes to interact with other agencies to process, settle and reconcile interoperable Transactions.</p>
WF-016	<p><b>TCS configuration management</b>            The TCS shall provide system functionality and operations processes to provide configuration management of the Hardware and Software in the TCS.</p>

Plans and Testing

Req ID	Plans and Testing (Section TP)
TP-001	<p><b>Roadside System and Network System Plan</b>                      The Toll System Provider shall provide a Joint Board-approved Roadside System and Network System Plan including but not limited to how the System is designed, installed, configured and commissioned <b>no later than 90 days after NTP</b>. The Roadside System and Network System Plan are comprised of two components, the roadside system plan documentation and the network system plan documentation. Each component of the Roadside System and Network System Plan shall include operations and maintenance manuals, System architecture documents and diagrams, installation manuals and all external and internal Interface Control Documents. The Toll System Provider shall also provide a copy of the Software licenses and Hardware cut sheets.</p>
TP-002	<p><b>Back office System Plan</b>                      The Toll System Provider shall provide a Joint Board-approved Back Office System Plan, which shall include but not be limited to how the System is designed and configured, <b>no later than 90 days after NTP</b>. The Back Office System Plan shall include operations and maintenance manuals for all users of the System, System architecture documents and diagrams, installation manuals and all external and internal Interface Control Documents.</p>
TP-003	<p><b>TOC System Plan</b>                      The Toll System Provider shall provide a Joint Board-approved TOC System Plan and documentation <b>no later than 90 days after NTP</b>. The Toll System Provider shall provide Toll Operations Center System Documentation for the monitoring of the TCS. The TOC System Plan shall include all the System monitoring plans and procedures, monitoring alarms, priorities and how issues are identified, tracked and resolved. The Toll System Provider shall provide any existing manuals for incident response externally and internally, levels of escalation for incidents and tracking methodologies for incidents and their resolution.</p>
TP-004	<p><b>Roadside System and Network Installation Plan</b>                      The Toll System Provider shall provide a Joint Board-approved Roadside System and Network Installation Plan <b>no later than 180 days after NTP</b>. The Roadside System and Network Installation Plan shall describe the TCS installation approach, configuration parameters, schedule, methodology, proposed maintenance of traffic, and required resources (including those of the Joint Board, if applicable).</p>
TP-005	<p><b>BOS Installation Plan</b>                      The Toll System Provider shall provide a Joint Board-approved BOS Installation Plan <b>no later than 180 days after NTP</b>. The BOS Installation Plan shall describe the installation approach, proposed installation schedule, configuration parameters schedule, methodology and required contract resources and Joint Board (if applicable) resources in the plan.</p>
TP-006	<p><b>TCS As-Built System Documentation</b>                      The Toll System Provider shall provide Joint Board-approved As-Built System Documentation for the deployed System at the Project <b>no later than 30 days after the successful completion of the System Acceptance Test</b> with any updates made since the first submission addressed in the second submission. As-Built System Documentation shall be provided in native format as well as PDF document format. The As-Built System Documentation shall include all Business Rules, Hardware cut sheets and design, Software configuration and code (where applicable) as well as installation drawings, schematics and other diagrams that describe the physical, logical, business and operational configuration of the System.</p>
TP-007	<p><b>Training Plan</b>                      The Toll System Provider shall provide a Joint Board-approved Training Plan <b>no later than 180 days after NTP</b>. The Training Plan shall provide a list of all training courses planned to be delivered to new and existing staff on the Project. The Training Plan shall also describe training facilities, typical training equipment, proposed training for local staff, and provide course outlines for the training program. A list of all user manuals shall be described in the Training Plan as well. The Training Plan shall describe where the Joint Board staff will be trained throughout the Contract Term. The Joint Board and/or its representatives shall be invited to observe and participate in all elements of the training.</p> <p>The Training Plan shall also include a list and description of all user roles and access rights for the TCS. This list shall include all users of the TCS including Joint Board Designated Representatives.</p>

Req ID	Plans and Testing (Section TP)
TP-008	<p><b>TCS Project Management Plan</b>  The Toll System Provider shall submit a Joint Board-approved TCS Project Management Plan for the installation and delivery phase of the Project and update the TCS Project Management Plan for the operations and maintenance phase of the project <b>no later than 90 days after NTP</b>. The TCS Project Management Plan shall adhere to the Toll System Provider's project management methodology to deliver the Project, but shall include a roles and responsibilities matrix that clearly identifies roles and responsibilities within the Toll System Provider's organization and any interfaces to the Toll System Provider, including but not limited to the Joint Board, ETC Vendor, Developer and DBT. The TCS Project Management Plan shall also address resources, schedule, communications and delivery of the Work.</p>
TP-009	<p><b>Safety Plan</b>  The Toll System Provider and each Major Subcontractor shall submit a Joint Board-approved Safety Plan <b>no later than 90 days after NTP</b>. The Safety Plan shall address how the Toll System Provider shall conduct its work using safe methods. The Safety Plan shall also describe how safety is communicated with its employees, how safety audits are completed and any other information necessary to perform Work on the Project.</p>
TP-010	<p><b>System Configuration and Management Plan</b>  The Toll System Provider shall provide a Joint Board-approved System Configuration and Management Plan <b>no later than 90 days after NTP</b>. The System Configuration and Management Plan shall describe how Hardware, Software and system configuration settings will be managed from Tolling Readiness through the Operations and Maintenance Term. The System Configuration and Management Plan shall describe how any change is identified, documented, controlled and verified during the Installation Work and the Operations and Maintenance Term. Any change proposed by TSP shall be submitted to the Joint Board for review and approval pursuant to the Approval Process.</p>
TP-011	<p><b>Maintenance and Support Plan</b>  The Toll System Provider shall provide a Joint Board-approved Maintenance and Support Plan <b>no later than 180 days after NTP</b>. The Maintenance and Support Plan shall describe how the Toll System Provider shall conduct preventative and corrective maintenance and support activities for the Roadside System and the BOS. The Maintenance and Support Plan shall describe preventative maintenance, corrective maintenance, Spare Parts and inventory management procedures and how Operations and Maintenance Work is managed for the System. While one plan is required, the Toll System Provider may submit a separate MSP for each functional area, for example there may be a Roadside System MSP and a BOS MSP as two separate plans. However, if more than one MSP is submitted, the MSPs shall demonstrate end to end coverage of the System. If the Toll System Provider has predictive maintenance activities this should also be described in the MSP, and the MSP shall address how the Toll System Provider shall meet all Performance Requirements, priority response and repair times for each item. The Toll System Provider shall include an organization chart and notifications for incidents as well a description of how MOMS is used to track incidents through resolution.</p>
TP-012	<p><b>Transition Plan</b>  The Toll System Provider shall provide a Joint Board approved Transition Plan <b>no later than 180 days after NTP</b>. The Transition Plan shall describe how the System will be transitioned from test environments to production using the testing approach described in the Technical Requirements. Further the Transition Plan shall include all resources, scheduling and detailed step by step transition procedures for the overall System transition from test environments to production.</p>
TP-013	<p><b>Third Party Manuals and Documentation</b>  The Toll System Provider shall provide and maintain standard, commercially available, updated documentation for third-party provided Hardware, Software, and services. This set of manuals shall be maintained on a Toll System Provider provided shared collaboration site (e.g. SharePoint, eRoom) and be available to the Joint Board <b>no later 180 days of NTP to review and download</b>. The Toll System Provider shall update these documents as required no less frequently than every 180 calendar days.</p>
TP-014	<p><b>End of Contract Transition Plan</b>  The Toll System Provider shall provide a Joint Board approved End of Contract Transition Plan <b>at the completion of the System Acceptance Test</b>. This End of Contract Transition Plan shall address how the Toll System Provider will efficiently and seamlessly transition, without any disruption to users or the Joint Board, the operation and maintenance of all aspects of the System to another toll system provider or providers. The End of Contract Transition Plan is subject to Joint Board review and approval and shall be updated no less frequently than annually after approval. All updates are also subject to Joint Board review and approval. The End of Contract Transition Plan shall address the items described in Section 4.13 of the Agreement, and if the BOS and CSC services are provided at a commingled facility the End of Contract Transition Plan shall take into account special considerations related to the commingled facility.</p>

Req ID	Plans and Testing (Section TP)
TP-015	<p><b>Business Rules and Operational Requirements (BROR)</b>  The Toll System Provider shall provide an initial BROR for the Project <u>no later than 90 days after NTP</u>. Once approved by the Joint Board, the Business Rules and Operational Requirements shall be attached to the Technical Requirements. The Business Rules and Operational Requirements <u>shall be updated 180 days prior to the Tolling Readiness Date and again 90 days after the System Acceptance Test is successfully completed</u>. The Business Rules and Operational Requirements shall be submitted to the Joint Board each time for review and approval. The Business Rules and Operational Requirements shall describe all Business Rules for the Operations and Maintenance Work for all components of the System, including any external systems used to operate and maintain the System.</p>
TP-016	<p><b>Monthly Project Management Report and Meeting</b>  Every month of the Contract Term, the Toll System Provider shall deliver a Monthly Project Management Report that describes the current status of the Project, current or new risks on the Project, a summary of work completed in the last 30 days and expected work to be completed in the next 30 days. The form of the Monthly Project Management Report shall be subject to the review and approval of the Joint Board. The Monthly Project Management Report shall also include an updated resource loaded GANTT schedule delivered in MS project and delivered in PDF. The Project schedule shall reflect current staff and progress measured against the baseline schedule. The Monthly Project Management Report shall highlight the Critical Path and near Critical Path items on the Project and the Toll System Provider's current plan to ensure no delays are incurred during the delivery. If the Toll System Provider is behind schedule or also upon the request of the Joint Board, the Toll System Provider shall provide a written corrective action plan that describes how and when the Toll System Provider will recover to meet the baseline approved Project schedule. Toll System Provider shall continuously monitor its compliance with this requirement commencing with Pre-Toll Operations, and report its compliance or noncompliance with this requirement each month in this Monthly Operations and Maintenance Report. <u>The Monthly Project Management Report and an updated Project Schedule shall be delivered at least 3 business days before the Project management review meeting with the Joint Board</u>. The Toll System Provider Project Manager - Installation shall attend this meeting in person.</p>
TP-017	<p><b>Quality Management Plan (QMP)</b>  The Toll System Provider shall provide a Joint Board approved Quality Management Plan <u>no later than 90 days after NTP</u>. The QMP shall be subject to the review and approval of the Joint Board and shall describe how the Toll System Provider manages the quality assurance and quality controls throughout the Contract Term. The QMP shall address verification and validation of changes including coordination with the change management plan, supply chain management including how all Suppliers and subcontractors are addressed in the delivery, operations and management of the TCS. The QMP shall address handling of materials, control of records on the Project, and how the Toll System Provider shall conduct audits to ensure the efficient and complete performance of the Work and other obligations of the TSP under the Contract.</p> <p>The Toll System Provider shall develop and maintain a quality assurance and quality control program to ensure compliance to all requirements and obligations in the Contract. The Toll System Provider QMP shall establish key performance measures, regular audits and reporting to ensure requirements compliance is repeatable and the customer experience is consistent and revenue collection is at the highest efficiencies possible. The quality assurance program shall be documented in the Quality Management Plan during delivery and shall be addressed in a quality assurance section to be included in the Monthly Project Management Report provided to the Joint Board.</p>
TP-018	<p><b>Configuration and Change Management Plan</b>  The Toll System Provider shall provide a Joint Board approved Configuration and Change Management plan <u>no later than 90 days after NTP</u>. The Configuration and Change Management Plan shall describe how the Toll System Provider identifies and manages change including the identification of a change control board to be used during the installation and configuration of the System as well as during operations. The Configuration and Change Management Plan will outline the process in which changes are identified, escalated and brought to the owner, process to notify the Joint Board of changes, and final resolution and tracking of changes throughout the TCS Operations and Maintenance Term.</p>
TP-019	<p><b>Master Testing and Commissioning Plan</b>  The Toll System Provider shall provide a Joint Board-approved Master Testing and Commissioning Plan (MTCP) <u>no later than 90 after NTP</u>. The MTCP shall include a list of all of the testing including a description of each test, a sample and representative completed test procedure for the Project, roles and responsibilities for each test phase, the entry and exit criteria for each test including test environment for each test, a requirements traceability matrix used to verify the requirements and failure reporting, tracking and analysis. The MTCP shall be developed to satisfy the testing requirements as outlined below in Technical Requirements TP-020 thru TP-025 outlined below.</p>

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TP-020	<p><b>Baseline Test</b>  The Baseline Test will provide an initial validation of the System's compliance with the Technical Requirements. The Baseline Test is not intended to be a performance test but rather an initial component level and end to end functional test of the System. The Baseline Test Plan shall include component level testing for the following areas. In addition it shall demonstrate the end to end functionality of the System as it is available in its current state. External interfaces shall be used in all instances possible but simulated external interfaces or external interfaces may be used with Joint Board approval in this test phase. The Baseline Test shall be conducted at the Toll System Provider's test facility or factory environment. A simulated Roadside System or test facility may be used for the Baseline Test. The Baseline Test planning shall be an end to end view of all testing on the Project but the Baseline Test plan and procedures shall provide component level tests that exercise elements of each of the major functional systems below to demonstrate compliance with the Technical Requirements.</p> <p>The Baseline Test Plan shall, at a minimum, encompass the following areas:</p> <ol style="list-style-type: none"> <li>1. Roadside System Transaction creation, processing</li> <li>2. Roadside System degraded mode of operation and failure recovery</li> <li>3. System Monitoring (MOMS)</li> <li>4. Image Review</li> <li>5. IVR</li> <li>6. BOS ETC and Violations account management</li> <li>7. BOS, credit cards, Violations, collections and court processes</li> <li>8. Payment processes and exception management</li> <li>9. Toll Operations Center including all interfaces</li> <li>10. Payment processing for all available payment methods</li> <li>11. Customer Website</li> <li>12. Disaster recovery including failover of the BOS and CSC.</li> </ol> <p>This test must be successfully completed by the Toll System Provider and approved by the Joint Board before continuing to the next phase of testing.</p>
TP-021	<p><b>Pre-Production Controlled Test</b>  The Pre-Production Controlled Test shall occur after the configuration of the external interfaces and Business Rules for the TCS. The same test procedures may be used for the Pre-Production Controlled Test as are used in the Baseline Test, and the Pre-Production Controlled Test shall be conducted at the Toll System Provider's test facility. With the exception of the Roadside System at the Project Sites, the Pre-Production Controlled Test shall use the configured interfaces for the System. The Pre-Production Controlled Test as it relates to the Roadside System shall reflect the System intended to be installed on the Project but shall be connected to the Toll System Provider's test facility. Vehicles shall be run at speeds from 0 MPH to 65 MPH at the test facility to conduct the Pre-Production Controlled Test. A minimum of four Equipment Lanes shall be configured to conduct this test. It is also understood that the network connections may be different than the network planned for the Project but all interfaces shall be configured to operate in near-real-time as close to a production environment of the Project as possible. To allow for integration of the Roadside System to the ETC equipment, use of a single ETC reader integrated with the Roadside System is anticipated for the Baseline Test.</p> <p>This test must be successfully completed by the Toll System Provider and approved by the Joint Board before continuing to the next phase of testing.</p>
TP-022	<p><b>BOS Production Readiness Test</b>  The BOS Production Readiness Test shall be the same as the Pre-Production Controlled Test as it relates to the BOS, but shall be conducted with all final components required for revenue service. No simulated interfaces may be used in the BOS Production Readiness Test, except those simulating roadside Transactions. The same test procedures used for the Baseline Test shall be used for the BOS Production Readiness Test, but without the use of simulators.</p> <p>The BOS Production Readiness Test shall verify that the following conditions are met:</p> <ul style="list-style-type: none"> <li>• The BOS is available and functioning properly, including BOS Hardware and network communications, and each component of the BOS is available to collect revenue,</li> </ul>

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	<p>receive information from the Roadside System, process information and Transactions correctly and provide customer service operations.</p> <ul style="list-style-type: none"> <li>• Transactions successfully processed through the BOS and then successfully moved to the appropriate Transaction route in the BOS solution. The routes the Transactions may take, shall result in a rate assignment for each Transaction and association of the correct customer account for that Transaction, or the BOS shall send the Transaction through the video process to either associate with a known account or proceed to identify the Transaction to an appropriate vehicle owner. The distribution of Transaction types will be agreed upon by the Toll System Provider and the Joint Board.</li> <li>• The methodology pursuant to which the Toll System Provider shall report upon its compliance with the SLAs has been approved by the Joint Board.</li> <li>• BOS-related network communications have been tested and are successfully operating.</li> <li>• All required interfaces and file transfers have been tested and are successfully operating for required interfaces, including interoperable interfaces.</li> <li>• The CSC must be open and operational and able to provide all customer service functions as required in Section CS of the Technical Requirements. The test shall demonstrate that the IVR and Customer Website are operational and comply with Business Rules and PCI DSS compliance rules and regulations. All cash handling operations must be verified and ensure compliance with all rules and regulations as well as all other payment processing procedures.</li> <li>• All Correspondence capabilities shall be reviewed, verified and validated, including the: <ul style="list-style-type: none"> <li>○ Ability to process all types of invoices including pay-by-plate, Violations, collections and final collection,</li> <li>○ Ability to process Violations through court documentation preparation and procedures,</li> <li>○ Ability to process Customer Website Correspondence,</li> <li>○ Ability to process different types of Transactions, payments, and Violations through the IVR, and validate the IVR system, and</li> <li>○ Ability to meet all deadlines and response times established in the Contract Documents and Business Rules.</li> </ul> </li> <li>• All TCS reporting and monitoring are operational and have begun to collect data from different components of the TCS. Report formatting and report generation are complete. Typical responses to system incidents have been outlined and tested.</li> <li>• Media data submission and reporting have been developed and approved by the Joint Board for daily, weekly and monthly submissions.</li> </ul> <p>This test must be successfully completed by the Toll System Provider and approved by the Joint Board before continuing to the next phase of testing.</p>
TP-023	<p><b>System Production Readiness Test</b></p> <p>The System Production Readiness Test shall be the same as the Pre-Production Controlled Test but shall be conducted with all final components required for revenue service and using the Project Toll Zones and vehicles and customer accounts at the LSIORB Project Toll Zones in Kentucky or Indiana. No simulated interfaces may be used in the System Production Readiness Test. The same test procedures used for the Baseline Test may be used for the System Production Readiness Test, but without the use of simulators. This test shall be conducted for the Temporary Downtown Traffic Configuration, East End Bridge, and the Final Downtown Traffic Configuration.</p> <p>The System Production Readiness Test shall be performed prior to live traffic conditions to verify that the System is ready to open to traffic and verify preparedness for toll collection activities. The TCS is considered ready to open to traffic and able to collect revenue when the following conditions are met:</p> <ul style="list-style-type: none"> <li>• The TCS is available and functioning properly, including System Hardware and network communications, and each component of the TCS is available to collect revenue, receive information from the Roadside System, process information/Transactions correctly and provide customer service operations.</li> <li>• The System is able to successfully identify from the Roadside System equipment that a Transaction has occurred through either Transponder identification or license plate identification. The Transaction should successfully process through the Roadside System and then successfully move to the appropriate Transaction route in the BOS solution and the TOC. The route the Transactions may take are varied depending upon the System but should result in a rate assignment for each Transaction, associate the correct customer account for that Transaction, or the System shall send the Transaction through the OCR process to either associate with a known account or proceed to identify the Transaction to an appropriate vehicle owner. The System shall be capable of performing these functions for 1100 Transactions of varying types encompassing all Transaction types prior to Tolling Readiness. The distribution of Transaction types will be agreed upon by the Toll System Provider and the Joint Board.</li> </ul>

	<p>The Toll System Provider is prepared to collect data per the agreed upon methodology upon Revenue Service. The methodology to measure SLAs has been established, the methodology to report Performance Requirements and the reporting tools and medium has been agreed upon by the Joint Board and the Toll System Provider</p> <p>Network communications have been tested and are successfully operating.</p> <p>All required interfaces and file transfers have been tested and are successfully operating for required interfaces, including interoperable interfaces.</p> <p>This test must be successfully completed by the Toll System Provider and approved by the Joint Board before continuing to the next phase of testing.</p>
TP-024	<p><b>Operations Tests</b></p> <p>The Toll System Provider shall conduct four Operations Tests: i) a BOS, CSC, TOC operations test, ii) Temporary Downtown Traffic Configuration iii) East End Bridge, and the iv) Final Downtown Traffic Configuration. Each Operations Test shall be a live Operations Test of the System using controlled and live test vehicles and accounts to demonstrate that the TCS operates within the approved Business Rules and Technical Requirements. The Toll System Provider shall conduct this operations test for a minimum of 120 days after the commencement of Revenue Service for each Bridge including the BOS. The Operations Test for the BOS, CSC, and TOC shall be conducted after the first bridge commences Revenue Service. The Operations Tests shall verify the following elements on a weekly basis be submitted no more than 2 business days after the conduct of the test.</p> <p>The Operations Test requirements shall be addressed in the MTCP but should include the following at a minimum:</p> <ol style="list-style-type: none"> <li>1. ETC and Image Transaction Creation and flow and posting to all 10 test accounts and trace Transactions in at least 10 production accounts selected by the States' Parties to ensure Transactions are created, posted and processed according to requirements.</li> <li>2. Test IVR to make payments, and exercise the IVR tree to ensure information is available to the customer per the specified Business Rules.</li> <li>3. Test Customer Website to validate invoice information is available and makes payments and validate that the website is available and operating in accordance with the Business Rules and requirements.</li> <li>4. Validate payment processing for credit cards, checks, retail centers, and lockbox posting.</li> <li>5. Validate Violation escalations, invoice information presented on the account, escalation to collections and court. The escalation configurable periods used for collections and court may be manually adjusted but the escalated configurable periods for Customer Statements must use the configured production System times.</li> <li>6. Confirm all payments and Transactions for test accounts and selected production accounts are reflected properly in the financial reports and any financial records transmitted to the accounting system provided by others.</li> <li>7. Confirm all interoperable accounts and Transactions are posting in accordance with E-ZPass rules and funds are reconciled within the TCS.</li> <li>8. Monitor and record all incidents, and report all priority 1 incidents to the Joint Board with resolution plan including a root cause analysis.</li> </ol> <p>This test must be successfully completed by the Toll System Provider and approved by the Joint Board before continuing to the next phase of testing.</p>
TP-025	<p><b>System Acceptance Test (SAT)</b></p> <p>The System Acceptance Test will be performed in live traffic conditions after all the Bridges have been opened for Revenue Service. SAT will be performed to ensure that the TCS functions as required by the Technical Requirements, the Guaranteed Performance Requirements as provided in Exhibit N of the Agreement, and all other requirements of the Contract Documents. The purpose of the SAT is to validate that the Roadside System equipment identifies the Traffic Transactions properly and collects the appropriate data, the BOS solution successfully processes that data, and the customer service operations perform as required to support the needs of the toll patrons while supporting maximum revenue collection with minimum leakage at the required service levels. SAT will be performed after numerous component tests occur as listed in TP 020-025 of the Technical Requirements (Appendix C). SAT will verify that the overall TCS, including Hardware and Software, performs at the required service levels and at the required throughput.</p> <p>In order for SAT to be requested and agreed upon by the Joint Board, SAT will be performed after all outstanding trouble tickets other than those with respect to immaterial items that don't affect System functionality have been resolved; all prior operational component testing is complete as outlined in Technical Requirements TP-020, TP-021, TP-022, TP-023, and TP-024 and accepted; and an established methodologies have been utilized for a first collection of the data required to measure compliance with Performance Requirements. SAT testing will occur after the completion of the Operations Tests and will run for a period of 48 hours of roadside traffic operations and for a period of 60 days for all TCS components and operations.</p>

SAT will verify that:

- Each component of the TCS is available and performing to the required Performance Requirements in TR Section PR
- All processes and work flows will be verified including but not limited to WF-001 through WF-016.
- Ensure compliance with all Business Rules.
- System network and system architecture requirements have been successfully implemented, completed, tested, verified, validated and performing and are available for use by the Joint Board's TCS. Test and verify timeliness of response to potential network and communications failure.
- Test the disaster recovery systems and test the Disaster Recovery System Plan.
- Ensure Transaction record accuracy has been achieved at all Toll Zones. Traffic Transactions and Event Transactions from each Toll Zone will be reviewed, verified and followed to each end state of the Transaction.
- BOS requirements have been successfully implemented, completed, tested, verified, validated and are performing and available for use by the Joint Board's TCS through account sampling, setup, verification, and validation.
- Toll Operations Center and system monitoring have been successfully implemented, completed, tested, verified, validated and are performing and available for use by the Joint Board's TCS. Test system messaging and response times to different message types and ensure timeliness and responsiveness of operation and maintenance staff.
- All Correspondence capabilities will be reviewed, verified and validated including the ability to process all types of invoicing including registered and unregistered license plate accounts, Violations, collections and final collection process through court documentation preparation and procedures;
- Ability to process Customer Website Correspondence, and the ability to process different types of Transactions by IVR, process payments, process Violations and validate the IVR system.

CSC operations will be fully reviewed to ensure all SLAs are met including all requirements as outlined in Section CS of the Technical Requirements including the additional items below: 1) Verification of live call handling by CSRs, 2) Secret shopping to the Walk-up Centers and remote operations (if implemented), 3) Random spot check and review of lockbox and lockbox compliance with operational procedures and 4) Confirm and test money handling procedures at each retail location and/or remote locations (if applicable).

The SAT will also verify the following:

1. Review HR policies and HR procedures of all staff on the TCS team to ensure the policies and procedures are followed in accordance with the Joint Board approved Toll System Provider policy.
2. Confirm that all transfers of files and interfaces to all outside systems are tested, validated and are functioning according to requirements. Process file transfer in near-real-time and verify transfer of data with outside interfaces
3. Financial transfers of funds are occurring timely with maximum availability of cash funds to the Joint Board on a daily basis with concise, timely, and precise reconciliation of all funds, accounts, sub ledgers, etc.
4. Confirm that all interoperable accounts are handled and processed in a timely manner and ensure all interoperable Transactions are processed according to each interoperable agency's agreed upon Business Rules and operational agreements. 100 interoperable Transactions will be traced and verified and validated throughout the TCS to final financial reconciliation from each interoperable agency.

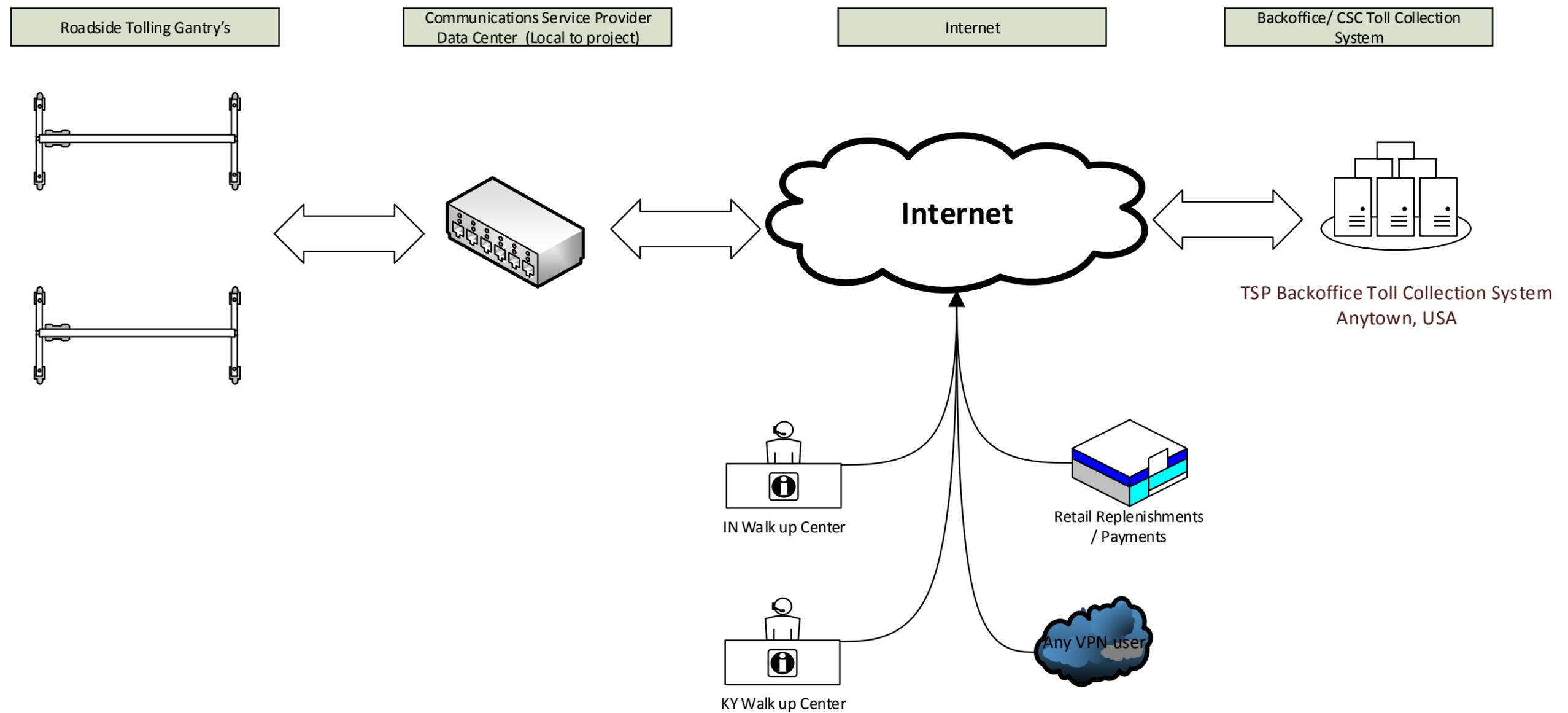
The SAT must be successfully completed by the Toll System Provider and Approved by the Joint Board before being granted Final System Acceptance

TP-026	<p><b>Document Reviews</b> The Toll System Provider shall plan for 2 document reviews for submittals and allow for 10 day review cycles by the Joint Board for all documents submitted for Joint Board Review and approval. No new comments are expected after the second cycle but additional review cycles may be required if the Joint Board's comments are not addressed in the first two review cycles to the Joint Board's satisfaction . All documents shall be provided in PDF and native versions including MS Office, AutoCAD, Visio or other similar products.</p>
TP-027	<p><b>Maintenance of Traffic Plan</b> The Toll System Provider shall be responsible for the planning and implementation and removal of lane closures for toll equipment preventative or emergency maintenance. The Toll System Provider shall utilize the most current state traffic control plans and standards applicable to the Toll Zone. The Toll System Provider shall request lane closures in writing and accordance with the applicable state policy. Any preventative maintenance lane closures must be requested in writing at least 14 calendar days in advance. Emergency lane closures shall be requested with 12 hours prior written notice. Notice of any immediate lane closures shall be communicated to the Joint Board representative via phone and email as soon as possible. The Toll System Provider shall include a unit price for each of the traffic control configurations outlined in the price proposal. The Joint Board will reimburse the Toll System Provider for each authorized lane closure required during installation and maintenance of traffic, excluding closures in excess of the limited number of hours established by the Contract for maintenance, unless the reason for closure was outside the Toll System Provider's control.</p>
TP-028	<p><b>Incident Management Coordination</b> States' Parties have two separate, but coordinated traffic management centers (TMC) to manage traffic incidents in each respective state and jointly coordinate incidents that impact both states. INDOT has a state operated traffic management center and KYTC contracts its traffic management services through TRIMARC in the Louisville Metropolitan area. It is anticipated that the designated Traffic Management Centers in KY or IN will notify the Toll System Provider by email and phone of incidents that occur that may impact tolling which may or may not require suspension. INDOT and KYTC TMC's are responsible for all incident management and will notify the Toll System Provider of any incidents within proximity of the Toll Zone by email. The Toll System Provider shall establish, maintain and support a dedicated phone line and maintain the phone system used for coordination with the traffic management centers. This phone number shall be a toll free number and shall be established at least 9 months prior to Tolling Readiness Date. No system to system integration or interface is required for the TMC. Phone, email and one way really simple syndication feeds shall be configured for the TMC operations.</p>
TP-029	<p><b>CSC Operations Plan (separate from BOS)</b> The Toll System Provider shall provide a Security and Access Control Plan for CSC, Lockbox Operation Staffing and Operational Plan, Training Program for CSC staffing, Organizational Chart for all staffing of CSC, Employment Policy for CSC employees and HR Policy and HR Benefits plan <b>no later than 180 days after NTP</b>. It is intended that the Toll System Provider provide these plans for the Joint Board review. No approval or comments are anticipated. However, due to federal requirements and funding on the Project, the Joint Board may provide comments on elements that are applicable to federal or state law.</p>
TP-030	<p><b>Walk-up Center Build out Plan</b> The Toll System Provider shall provide a Walk-up Center Plan <b>no later than 90 days after NTP</b>. This Walk-up Center Plan shall identify the overall scope and construction and operational opening schedule for the Walk-up Centers as well as lease information, layout functions and deployment approach, and required marketing information needed from the Joint Board.</p>
TP-031	<p><b>Monthly Operations and Maintenance Report</b> Monthly O&amp;M Performance Report that accurately describes the actual System performance as measured against the Performance Requirements section <b>shall be submitted in writing to the Joint Board each month no later than the 7th business day of the month</b>. If there is a deviation from the approved Performance Requirements agreements, the Toll System Provider shall identify a corrective action plan for all deviations. The Monthly O&amp;M Performance Report shall also include the inventory levels and performance of all equipment in the TCS. The first Monthly O &amp;M Performance Report shall be delivered 30 days after commencement of the Pre-Toll Operations. The Monthly O&amp;M Performance Report also shall include a statement of the number and type of accounts serviced during such month and the associated staffing levels for each account type during this reporting period. For non-ETC accounts, the Monthly O&amp;M Performance Report shall identify the number of accounts and full time equivalent staff that were serviced for all Customer Statements in each of the following statuses: 1) invoices, 2) Violations, and 3) Collection Status Violations (stated in total and separately for each state). The Toll System Provider shall also indicate the number of accounts and full time equivalent staff used for administrative hearings, and those accounts that were sent to court during the monthly reporting period. The Monthly O&amp;M Performance Report shall specify for each Customer Statement status the number of accounts in such status during the reporting period and the corresponding full time equivalent staff associated with each status on a monthly basis.</p>
TP-032	<p><b>Access to TSP Facilities</b> The Joint Board's Designated Representatives shall have access to the Toll System Provider's facilities and personnel at all times. The TSP shall provide an office for 2</p>

	people at the CSC for the Joint Board's use at any time. This office shall include a network workstation, phone and location for a member of the Joint Board's team to remain on site 100% of their time, if desired by the Joint Board.
TP-033	<p><b>Disaster Recovery System Plan</b></p> <p>The Toll System Provider shall provide a TCS Disaster Recovery System Plan and subsequent disaster recovery procedures for the TCS and CSC, which shall be reviewed and approved by the Joint Board <b>no later than 180 days after NTP</b>. The TCS Disaster Recovery System Plan shall include a description of each system along with a description of how each system in the TCS will be recovered. This plan shall describe all resources required to recover each system to operations. The Disaster Recovery System Plan shall also describe any single failure points in the System and the Toll System Provider's plan to recover the System.</p>

**Attachment C-1 - Network system architecture**

The proposed network TCS architecture is depicted in the diagram below. The Roadside Toll Zone will connect to a local data center via a point to point network (Layer 2 or 3 solution) that has access to communication service provider's facilities to connect the Roadside System to the BOS. The Toll System Provider is responsible for the local area network at the Toll Zone and all costs associated with this work are included in the Contract Price. The Toll System Provider is responsible for contracting with a communication service provider that is responsible to connect the network to an existing backbone and bring the network to an existing data center to then be made available on a leased line to be connected to a BOS solution which will be handled as a Pass-Through Cost Item. Segment 1 below is defined as the network between the roadside Toll Zone and the communications service provider's data center. Segment 2 below is defined as the network between the communication service provider to the Internet to the BOS and CSC of the TCS.

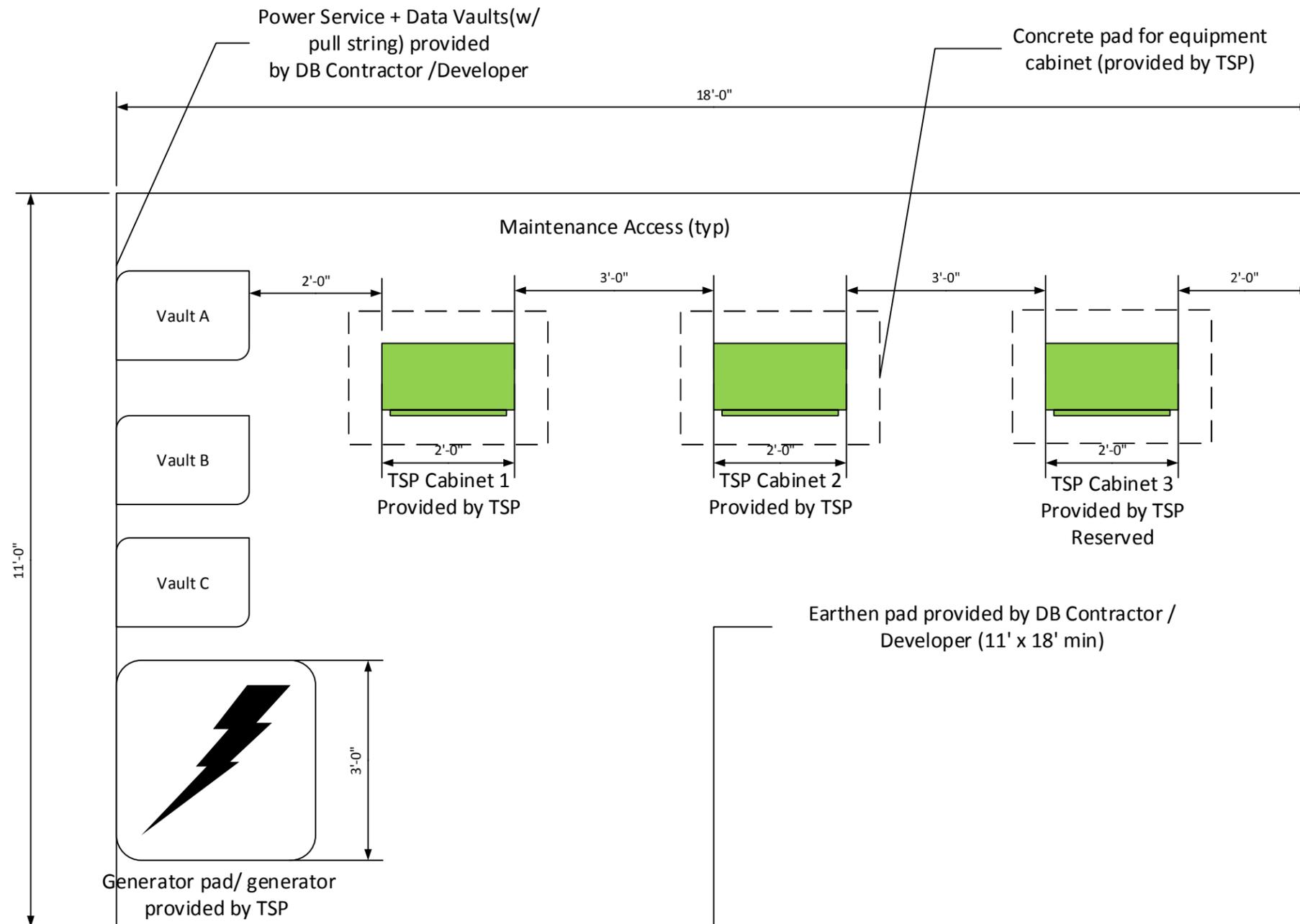


**ATTACHMENT C-2 - TOLL EQUIPMENT SITE PLAN**

**LSIORB Project - Toll Equipment Area – Proposed Equipment layout**

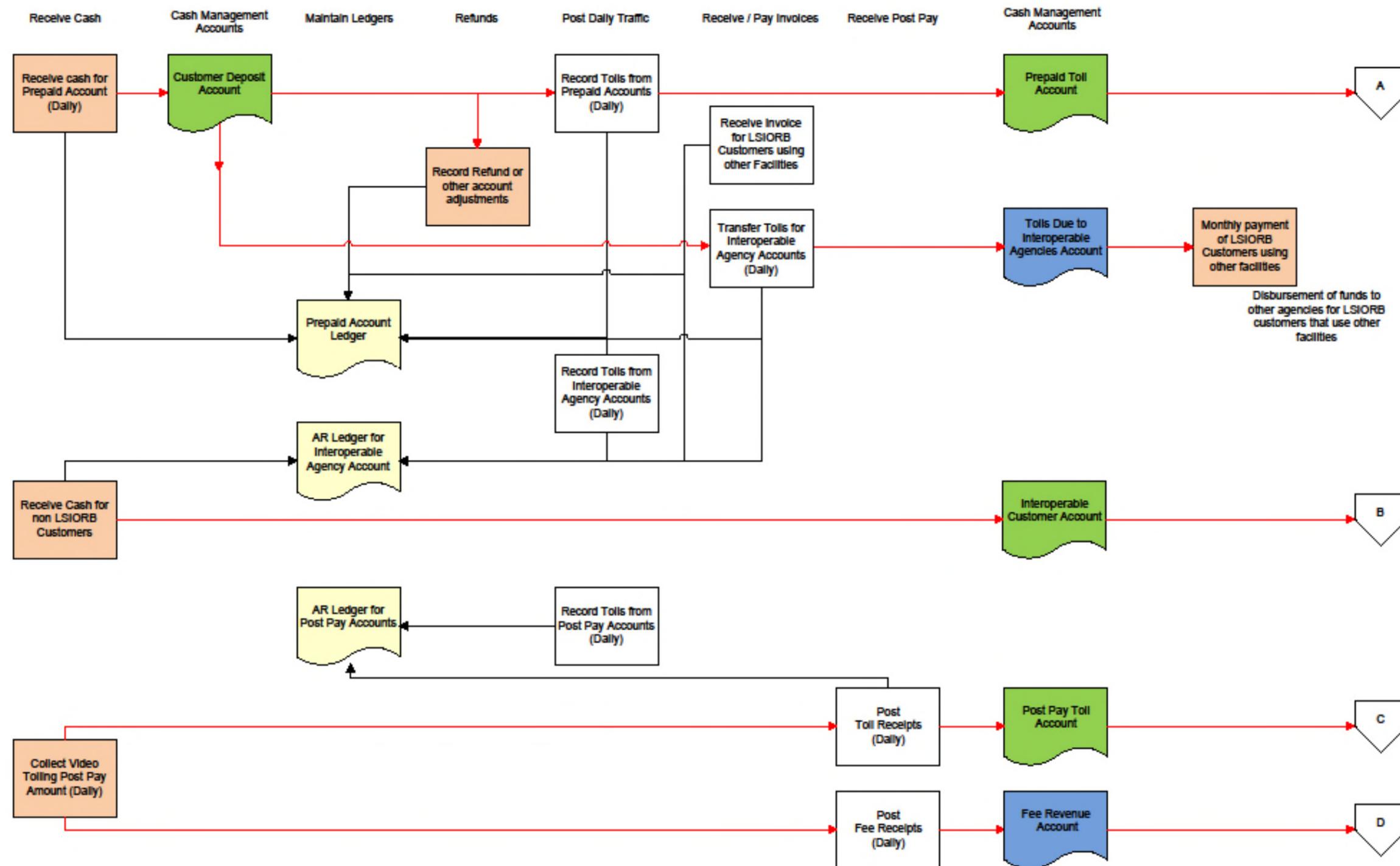
Note: DB Contractor (Downtown Crossing) and Developer(East End) provide vaults and earth pad for TSP to provide equipment and run conduits to cabinets.

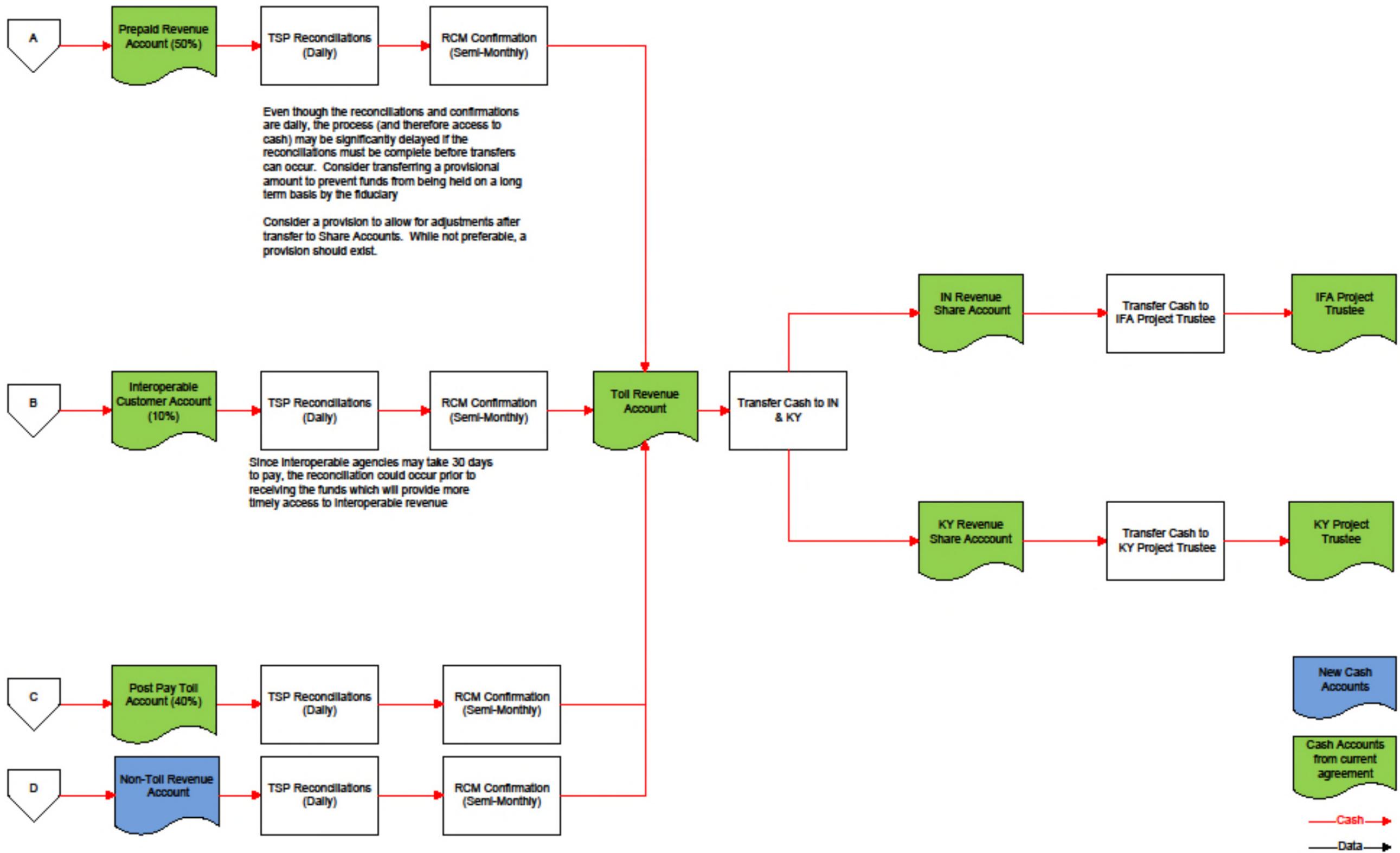
**DRAFT – for discussion only not for construction**



Attachment C-3 - Flow of Funds

Appendix A – Reconciliation Process Flow



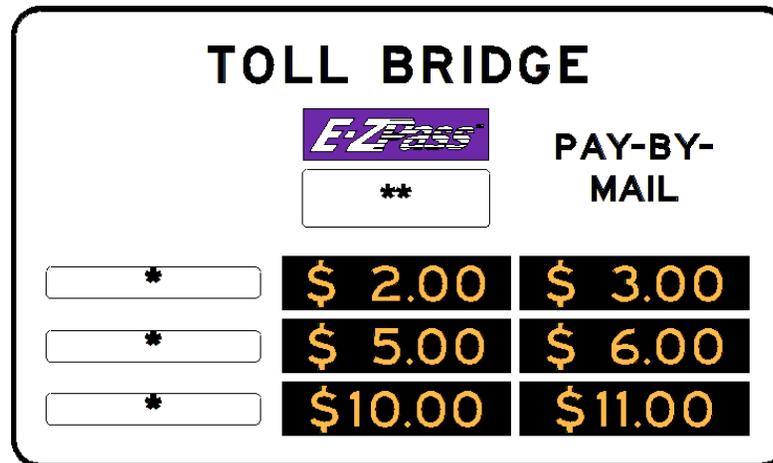


### Attachment C-4 Changeable Message Panel

The Toll System Provider shall provide LED panels and associated controller and controller cabinet for the Toll Rate Sign below. The Toll Rate sign structure and sign panel will be provided by others. The panel shall be an illuminated module placed in a cutout portion of the sign. The panel will require power and a communication element is required for remote control of the sign. A secure commercial wireless modem is acceptable for communications. A commercial power source will be provided by others and available within 100 feet of the Changeable Message Sign with an empty conduit run from the power source to the sign. The approximate toll bridge sign including logos(provided by others) size is 27 feet by 16 feet when changeable message panels (Provided by TSP) are used (this assumes a 15-inch display of rate amounts within the panels). Panel display is an assembly of a 35x7 matrix of light emitting diodes (LEDs).

The Toll System Provider shall also provide a CCTV camera and associated enclosure and wireless communications for the Toll System Provider to monitor and confirm the correct rates on the Toll Rate Sign. A pole within 50 feet, conduit and power source (may be the same as Toll Rate Sign) will be provided by others.

A list of the Toll Rate Signs and anticipated locations for the LSIORB Project are listed below:				
Roadway Type	Project Section	Project Station	Sign Reference Number	Comments
I-71 SB Mainline	1	Just East of Beargrass Creek Need stationing.	Not assigned	M.P. 0.45
I-64 WB Mainline	1	Between Mellwood & Story Just North of Bridge A039 Need stationing.	Not assigned	M.P. 3.02EB
I-64 EB Mainline	1	TBD 9 <sup>th</sup> Street Bridge/Ramp or Belvedere Need stationing.	Not assigned	M.P. 6.63EB (M.P. 6.35WB)
I-65 NB Mainline	1	Between Caldwell & Breckenridge	Not assigned	M.P. 134.90
I-65 SB Mainline	3	137+00	IGDO-30	M.P 0.69 (+386')
I-65 SB Mainline	3	217+10	IGDO-31	M.P. 2.20 (+220')
KY-841 NB Mainline	4	56+00	OSS-4	M.P. 36.00
I-265 SB Mainline	6	347+00	Not assigned	M.P 10.38



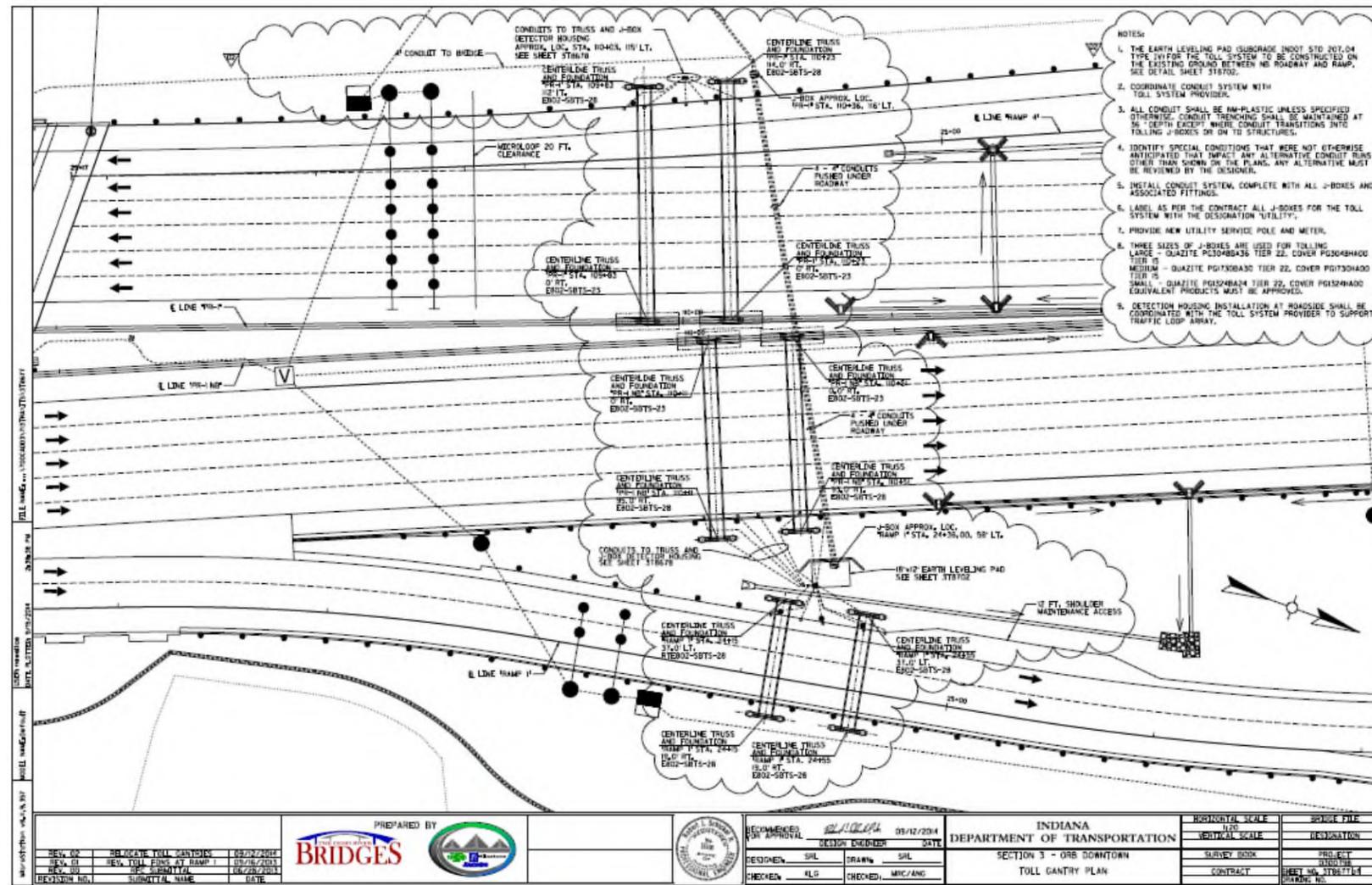
\* Reserved space for axle designation or shaped based designation as noted in the figures below.

\*\* Reserve a block sized 78 inches by 24 inches for local branding pictograph of toll collection. Pictograph has not been designed at this time.

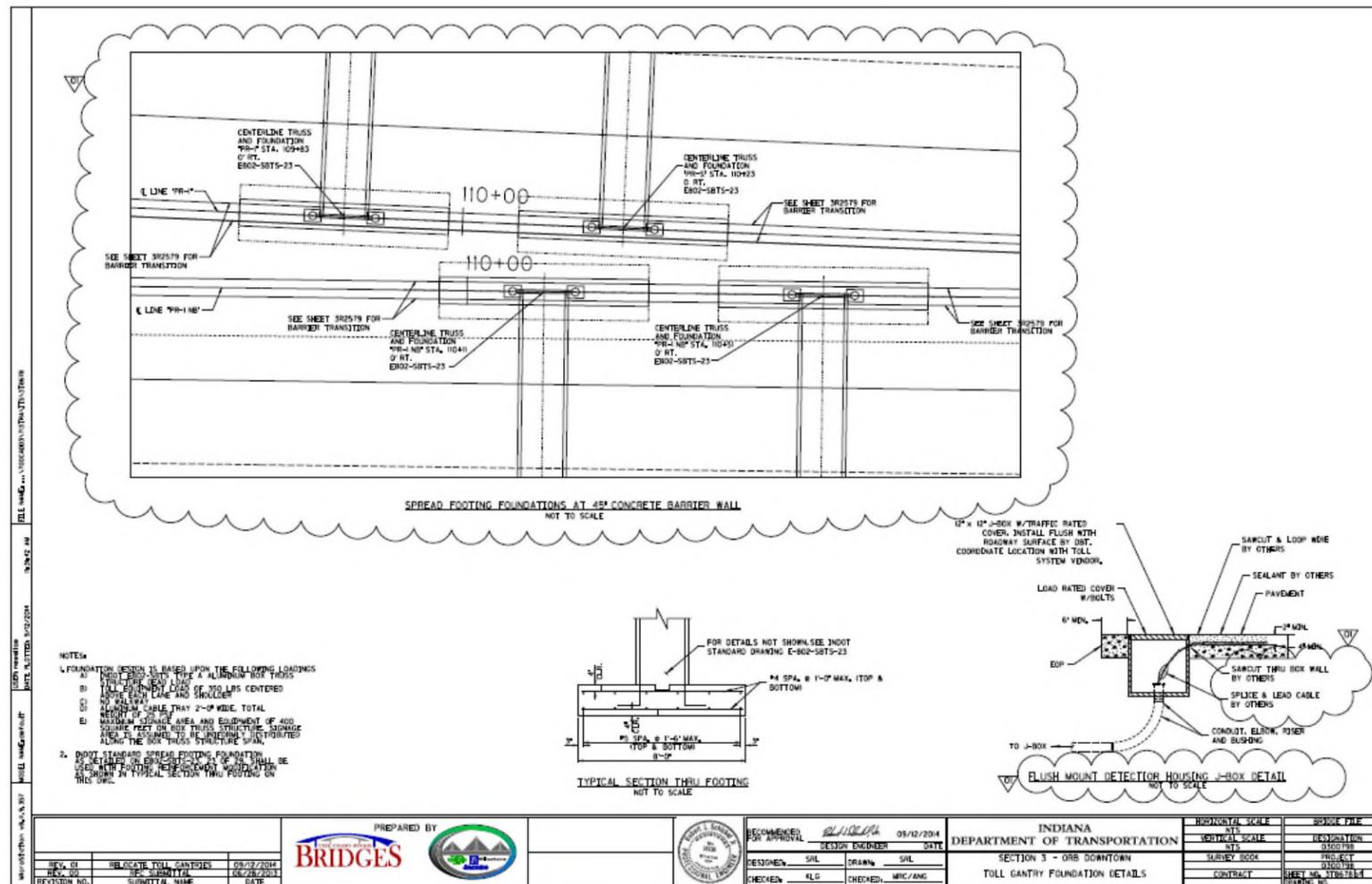
**Attachment C-5 - Roadside System Site Plans – THE MEASUREMENTS, LOCATIONS AND DIMENSIONS ON THE FOLLOWING DRAWINGS ARE APPROXIMATIONS ONLY AND SUCH MEASUREMENTS, LOCATIONS AND DIMENSIONS MAY NOT BE ACCURATE AND COMPLETE AND MAY NOT BE RELIED UPON.**

**Note: For the purpose of the drawings identified in Attachment C-5, TSI or Toll System Integrator shall mean Toll System Provider.**

### Downtown Crossing Project Sheet 1 of 2

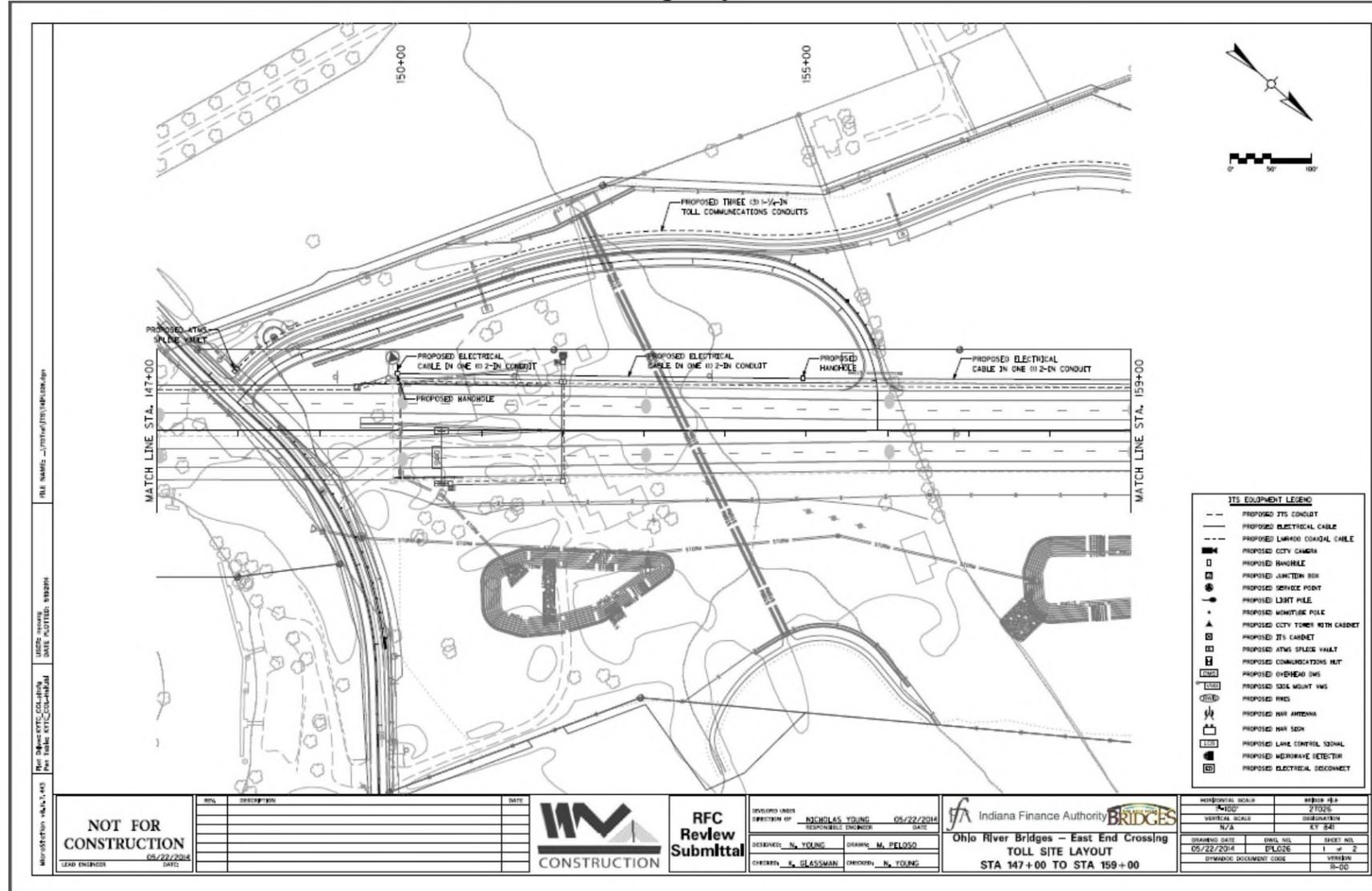


### Downtown Crossing Project - Sheet 2 of 2\*\*



	PREPARED BY <b>BRIDGES</b>	DESIGNED BY <b>BRIDGES</b>	CHECKED BY <b>BRIDGES</b>	DATE 05/12/2014	INDIANA DEPARTMENT OF TRANSPORTATION	SECTION 3 - ORR DOWNTOWN TOLL GANTRY FOUNDATION DETAILS	HORIZONTAL SCALE 1" = 10'	BOOK FILE DESIGNATION PROJECT SHEET NO.
REV. NO.	RELOCATE TOLL GANTRIES	05/12/2014						
REV. NO.	REV. SUBMITTAL	06/28/2014						
REVISION NO.	SUBMITTAL NAME	DATE						

East End Crossing Project - Sheet 1 of 2\*\*



<p><b>NOT FOR CONSTRUCTION</b></p> <p>DATE: 05/22/2014</p>	REV	DESCRIPTION	DATE		<p><b>RFC Review Submittal</b></p>	DEVELOPER UNDER RESPONSIBILITY OF: <b>NICHOLAS YOUNG</b> DATE: <b>05/22/2014</b>		HORIZONTAL SCALE: <b>1"=100'</b>	SHEET NO.: <b>21026</b>	
	LEAD ENGINEER:	DESIGNED BY: <b>N. YOUNG</b> DRAWN BY: <b>M. FELLOSO</b>	CHECKED BY: <b>S. GLASSMAN</b> PROJECT: <b>N. YOUNG</b>			VERTICAL SCALE: <b>N/A</b>		SUBDIVISION: <b>KT 341</b>		
<p>Ohio River Bridges – East End Crossing TOLL SITE LAYOUT STA 147+00 TO STA 159+00</p>						DRAWING DATE: <b>05/22/2014</b>	DWG. NO.: <b>01026</b>	SHEET NO.: <b>1</b> OF <b>2</b>	SYSTEMATIC DOCUMENT CODE: <b>VERBOD</b>	VERSION: <b>01-00</b>

# East End Crossing Project Sheet 2 of 2\*\*

