Exhibit F

SUMMARY AND ORDER OF PROPOSAL CONTENTS

Technical Proposal Component	Form (if any)	ITP Section Cross-Reference
A. Executive Summary		
Executive Summary **(Exclude price information)**	No forms are provided	Exhibit B, Section 3.1
B. Proposer Information, Certifications & Documents		
Proposal Letter	Form A	Exhibit B, Section 3.2.1
Authorization Documents	No forms are provided	Exhibit B, Section 3.2.1
Identification of Proposer and Equity Members	Form B-1	Exhibit B, Section 3.2.2
Information About Proposer Organization	Form B-2	Exhibit B, Section 3.2.2
Information About Major Subcontractors	Form B-3	Exhibit B, Section 3.2.2
Letter accepting joint and several liability, if applicable	No forms are provided	Exhibit B, Section 3.2.2
Responsible Proposer and Major Subcontractor Questionnaire	Form C	Exhibit B, Section 3.2.3
Letter(s) Regarding Pre-Proposal Submittals	No forms are provided	Exhibit B, Section 3.2.4
Non-Collusion Affidavit	Form D	Exhibit B, Section 3.2.5
Buy America Certification	Form E	Exhibit B, Section 3.2.6
Surety/Financial Institution Information	No forms are provided	Exhibit B, Section 3.2.7
Conflict of Interest Disclosure Statement	Form F	Exhibit B, Section 3.2.8
Equal Opportunity Employment Certification	Form H	Exhibit B, Section 3.2.9
Lobbying Certification	Form I	Exhibit B, Section 3.2.10
Debarment and Suspension Certification	Form J	Exhibit B, Section 3.2.11
Insurance	No forms are provided	Exhibit B, Section 3.2.12

Technical Proposal Component	Form (if any)	ITP Section Cross-Reference
Confidential Contents Index	No forms are provided	Exhibit B, Section 3.2.13
Kentucky Bidders Form	Form N	Exhibit B, Section 3.2.14
Copies of Organizational Documents	No forms are provided	Exhibit B, Section 3.2.2
Proposer Teaming Agreement or Key Terms	No forms are provided	Exhibit B, Section 3.2.2
Executed Contracts or Term Sheets/Heads of Terms	No forms are provided	Exhibit B, Section 3.2.2
C. Financial Information Proposer must provide the corporate and financial information identified in Section 4.0 of Exhibit B, for the Proposer, Equity Members, Guarantors and any other Financially Responsible Party	No forms are provided	Exhibit B, Section 4.1
C1 Audited Fiscal Financial Statements and related updated financial materials submitted in response to SOQ for all periods subsequent to SOQ and unaudited interim financial statements (Exhibit B, Section 4.1)	No forms are provided	Exhibit B, Section 4.1
C2 Letter regarding material change in financial condition since submission of the SOQ and for next reporting period (Exhibit B, Section 4.2)	No forms are provided	Exhibit B, Section 4.2
C3 Guarantor Letter of Support (Exhibit B, Section 4.3)	Form L	Exhibit B, Section 4.3
D. Technical Response		
Technical Response	Form K	Exhibit B, Section 5.0
E. Preliminary Project Schedule		
Preliminary Project Schedule	No forms are provided	Exhibit B, Section 6.0

Price Proposal
Proposers shall follow the order of the Price Proposal Checklist in their submissions. A referenced copy of this document shall be submitted with the Price Proposal.

A. Price Forms		
Price Forms	Form G	Exhibit C, Section 1.3

System Architecture

Req ID	System Architecture (Section SA)	Required	Value Add
SA-001	The Toll System Provider shall provide equipment and technology that has already been designed, developed, tested, and currently is deployed on another AET System with a similar scope and in a similar or larger revenue operation.	X	

	Note: The Proposer shall identify in this Technical Response Form the other AET systems on which Proposer's proposed equipment and technology currently are deployed.
	
	Proposer Response: The Toll Collection System (TCS) proposed by the TSP complies with requirement SA-001 in the following manner:
	
	FastFlow™ , the Road Side System solution and FastToll ERP™, the Back Office System solution which is integrated with CSC and TOC functionalities, all developed by Sanef Group for the All Electronic Tolling System projects are currently deployed :
	
	• In USA and Canada using the RFID transponders
	  ○ in the State of Rhode Island on the Newport Pell Bridge (**23,000 vehicles per day**, two lanes, E-ZPass RFID Tag, Back Office, Maintenance support, Network and enforcement operation)
	  ○ and the Sakonnet River Bridge
	  ○ in Vancouver, British Columbia
	  ▪ on the Golden Ears Bridge (**50,000 vehicles a day**, 2x3 Lanes + shoulders – RFID Title 21 tags & Video Tolling, Full Back Office, Maintenance, Network & Enforcement
	  ▪ on the Port Mann Bridge (**150,000 vehicles per day**, 12 lanes + 8 shoulders, sticker tag, RFID Tags, ASTMv6 and video tolling. Interoperable with Golden Ears Bridge)
	• In Europe using the DSRC transponders
	  ○ In Ireland on the M50 Dublin motorway (**100,000 vehicles a day**, 2x4 Free-Flow lanes + DSRC tags + Video Tolling Back Office, Maintenance support, Network and enforcement operation)
	  ○ In England on the Dartford Crossing (**135,000 vehicles / day**, 16 lanes + shoulders, DSRC tags + Video Tolling, Back Office, Maintenance support, Customer Service and Enforcement operation)		

SA-002	The Toll System Provider shall provide a System which provides a future upgrade path.	X	
	Note: The Proposer shall describe in this Technical Response Form the current product lifecycle status and future upgrade path. Equipment swap-outs are acceptable. **Proposer Response:** [redacted]		

Req ID	System Architecture (Section SA)	Required	Value Add
	[redacted]		

Req ID	System Architecture (Section SA)	Required	Value Add
	[redacted]		

Req ID	System Architecture (Section SA)	Required	Value Add
	[redacted]		
SA-003	The Toll System Provider shall provide a System which provides high level redundancy for the TCS such that the TCS will meet and continue to meet all Performance Requirements as outlined in Section PR of the Technical Requirements at all times.	X	
	Note: The Proposer shall describe in this Technical Response Form the redundancy of the TCS.		

Req ID	System Architecture (Section SA)	Required	Value Add
	Proposer Response: [redacted]		

Req ID	System Architecture (Section SA)	Required	Value Add
	[redacted]		
SA-004	The Toll System Provider shall configure all servers, desktop and tablet computers to have Virus Protection and intrusion prevention Software that automatically obtains definition updates according to an approved, recommended, and configurable maintenance schedule provided in the Maintenance and Support Plan by the Toll System Provider.	X	
	Note: Virus protection Software is not applicable to Linux based platforms provided by the Toll System Provider. **Proposer Response:** The TCS proposed by the TSP complies with requirement SA-004. Each server, desktop and tablet computer is fitted with anti-malware and anti-virus software such as Kaspersky Pure or Kaspersky Total Security for Business according to the type of computers. The update of the virus and malware definitions will be daily and automatic and will be carried out according to Maintenance and Support Plan recommendations. Moreover, an IPS (Intrusion Prevention System) is implemented at perimeter network firewalls.		
SA-005	The Toll System Provider shall: 1) integrate the ETC into the Roadside System; 2) certify during the Installation and Delivery Phase and the TCS Operations and Maintenance Term that the Toll Zones are tuned and maintained to the ETC Contractor's specifications; 3) synchronize all ETC readers that are in the same Toll Zones; 4) analyze the site conditions, and install and configure all required sensors and Hardware in accordance with the Technical Requirements; 5) ensure full sensor coverage at all areas of the Toll Zone; 6) ensure front and rear ALPR cameras provide ninety nine and nine tenths percent (99.9%) image capture, including during individual camera failures and excessive glare conditions and other extreme weather conditions; and 7) integrate all components of the Roadside System to provide a fully functional and operational TCS.	X	
	Proposer Response: The TCS proposed by the TSP complies with requirement SA-005 as follows: 1- We will integrate the ETC into the Road Side System. We have already integrated Kapsch E-ZPass type ETC readers in Rhode Island on the Newport Pell Bridge, and we are familiar with integrating 18000-6C equipment from PMH1 in Vancouver. 2- We will tune and maintain the Toll Zones according to the ETC Contractor's specifications during the Installation and Delivery Phase (as already carried out on the Newport Pell Bridge with Kapsch recommendations, and as we have done with other contractors' equipment at PMH1) 3- We will synchronize all the ETC readers in the same Toll Zones (as already carried out on the Newport Pell Bridge according to Kapsch recommendations) 4- We will install and configure all the required sensors and Hardware to meet the Technical requirements (as done for all AET projects, see SA 011) 5- We will ensure full sensor coverage at all areas of the Toll Zone (refer to SA-003) 6- We will ensure front and rear ALPR cameras provide ninety nine and nine tenths percent (99.9%) image capture, including during individual camera failures and excessive glare conditions and other extreme weather conditions (KPI already demonstrated on all the above AET projects, see SA 001) 7- We will integrate all components of the Roadside System to provide a fully functional and operational TCS.(Integration capability already demonstrated in all the above AET projects see SA-001)		
SA-006	[Intentionally not used.]		
	Proposer Response: NA		

Req ID	System Architecture (Section SA)	Required	Value Add
SA-007	All data entered or generated in the TCS shall be retrievable through reports, applications and screens via tools by TCS authorized users at remote locations.	X	

Proposer Response: The TCS proposed by the TSP complies with requirement SA-007. It includes system logs and Data Warehouse technologies for retrieving all data entered or generated through reports, applications and screens. Access to all data is controlled using integrated Windows Security and authentication mechanisms.

The following table provides a sample list of standard reports implemented in the FastToll ERP™ system:

Report Code	Report Name	Report Code	Report Name
RPT01	Detailed Transaction Report (By Date, By Location, By Agency)	RPT26	Transaction Control - Daily Report
RPT02	Daily Operation Report	RPT27	Transaction Control - Monthly Report
RPT03	Account Current Balance below Thresholds	RPT28	Statement Aging Report – Summary
RPT04	Account Activity Report	RPT29	Statement Aging Report – Detail
RPT05	Accounts with Expired Credit Card	RPT30	Transponder Control Tracking
RPT06	Account Closing Report	RPT31	Transponder Queue List
RPT07	Daily Recap	RPT32	Order Fulfillment – Daily
RPT08	Monthly Recap	RPT33	Transponder Status Summary (Retired Transponders)
RPT09	Bank Reconciliation Report	RPT34	Transponder Distribution Summary
RPT10	IAG Financial Settlement Report	RPT35	Transponder Distribution Detail
RPT11	IAG Settlement Status By Transaction Date	RPT36	Image Reviewer Performance - Monthly Report
RPT12	IAG Settlement Status By Posting Date	RPT38	Image Reviewer Performance - Daily Report
RPT13	IAG Settlement Status By Agency	RPT39	Image Review Summary By Image Reviewer
RPT14	Daily Settlement Summary	RPT40	Image Review Priority Count
RPT15	Monthly Settlement Summary	RPT41	Image Review Detail
RPT16	CSR Daily Cash out Report	RPT42	Revenue By Class – Hourly
RPT17	CSR Refund Report	RPT43	Revenue By Class – Daily
RPT18	CSR Adjustment/Refund Summary	RPT44	Revenue By Class - Monthly
RPT19	CSR Adjustment/Refund Detail	RPT45	IAG Dispute Analysis - Sent/Received
RPT20	Trial Balance Detail - Daily Report	RPT46	Year to Date Revenue By Class
RPT21	Trial Balance Detail - Monthly Report	RPT47	Traffic By Class - Hourly Report
RPT22	Monthly Balance Summary Report	RPT48	Traffic By Class - Daily Report
RPT23	Financial Status - Daily Report	RPT49	Traffic By Class - Monthly Report
RPT24	Financial Status - Monthly Report	RPT50	E-ZPass Transactions and Revenue (By Date, By Location, By Agency)
RPT25	DTR(Detailed Transaction Report) by GL Accounts	RPT51	Year to Date Traffic By Class

SA-008	[Intentionally not used.]		

Req ID	System Architecture (Section SA)	Required	Value Add
	Proposer Response: NA		
SA-009	All Traffic, Financial and Event Transactions and images shall be retained on-line for two (2) years and shall be archived and stored for 10 years. Archived data shall be recovered and made available to the Joint Board within 48 hours of a request made by the Joint Board.	X	
	Proposer Response: The TCS proposed by the TSP complies with requirement SA-009. It includes: • A storage infrastructure based on the iSCSI (Internet Small Computer System Interface) storage system with capacity to store online at least two (2) years all Traffic, Financial and Event Transactions and images. iSCSI is an Internet Protocol (IP)-based storage networking standard for linking data storage facilities and used to transmit data over local area networks (LANs) which enable location-independent data storage and retrieval. • An archiving sub-system based on tape library which archives the Traffic, Financial and Event Transactions and images for ten (10) years after the end of the 2-year retention period. To recover the data, the Toll Collection System maintains a history of all data archived so that it is possible to find the location (on tape) of any archived data and by this way to make available easily the requested data within 48 hours following the query.		
SA-010	All TCS system logs shall be retained on-line for one (1) year and then shall be archived and stored for 10 years.	X	
	Proposer Response: The TCS proposed by the TSP complies with requirement SA-010. It includes: • A storage infrastructure based on the iSCSI storage system (see Response to SA-009) with capacity to store at least one (1) year all TCS system logs. • An archiving sub-system based on a tape library which after the retention period will archive the TCS system logs for a period of ten (10) years. To recover the data, the Toll Collection System maintains a history of all data archived so that it is possible to find the location (on tape) of any archived data and make available easily the requested data within 48 hours following the query.		
SA-011	All data except TCS system logs shall be retained on the server in accordance with requirements of Indiana and Kentucky state statutes and administrative codes as may be in effect during the Term of the Agreement.	X	
	Proposer Response: The TCS proposed by the TSP complies with requirement SA-011. We will have a lawyer who can examine Kentucky and Indiana state statutes to determine the data retention laws and regulations, and ensure the system complies with these laws.		
SA-012	The Toll System Provider shall provide a quarterly written report that shows data backup and retention status for all elements of the System (e.g. Roadside System, BOS); and System access audit reports shall show the user access data and modification to the access made.	X	
	Proposer Response: The Toll System Provider meets the SA- 012 technical requirement. Thanks to the FastToll ERP™ Data Warehousing tools, the TSP will provide quarterly audit reports (or more frequently if desired by the Joint Board). • A written report which will detail data backup and retention status for all elements of the System (e.g. Roadside System, BOS) • A system access audit report that will summarize or show all user access data and modification to the access made.		
SA-013	The Toll System Provider shall provide a backup and archiving schedule and Plan for the System and staff (if any) required for backing up the System. The backup Plan (included in the Maintenance and Support Plan) shall include data type and frequency of backup. Data related to the following shall be included in the backup Plan: application and associated configuration, Transaction and data information, database, operating systems, account management system, and Transaction system.	X	
	Proposer Response: The Toll System Provider meets the SA- 012 technical requirement. The TSP will provide no later than 180 days after NTP such back-up and archiving Plan as part of the Maintenance and Support Plan. This plan will detail the policy of the back-up and archiving (data type and frequency of		

Req ID	System Architecture (Section SA)	Required	Value Add
	backup) of the application and associated configuration, of the Transaction and data information, database, operating systems, account management system and Transaction system. For example, please find hereafter the Table of Contents of the Backup and Restore Plan of the Port Mann Project: 1. GENERAL 1.1 Reference & Applicable Documents 1.1.1. Reference Documents 1.1.2 Applicable Documents 1.2 Figures 1.3 Tables 1.4 Glossary of Terms 2. INTRODUCTION 2.1 Primary Operations Center (POC) Overview 2.2 Secondary Operations Center (SOC) 2.3 CTS 2.3.1 Workforce Manager 2.3.2 Social Miner System Backup and Restoration 3. POC BACKUP SOLUTION 3.1. Media Plan 3.2 Disk to Disk then Disk to Tape 3.3 Types of Backup Plans 3.4 Maintenance Plans 3.4.1 Application Servers Backup Plan 3.4.2. Backup Server Backup Plan 3.4.3 Domain Controller Backup Plan 3.4.4 File Server Backup Plan 3.4.4.1 VES Images Backup 3.4.5 SQL Servers Backup Plan 3.4.5.1 Database Backup 3.4.5.2 SQL Server Backup Types 3.4.6 Data Warehouse Databases Backup Plan 3.4.7 SQL Backup Test Procedures 3.5 Media (Tape) Archive 3.6 Manual SQL Database Restore Process 3.7 Data Warehouse Database Restore Process 3.8 Other Restore Processes 4. SOC Backup Solution 5. OFFSITE TAPE STORAGE 5.1 Introduction 5.2 Managing Offsite Backup Policy		
SA-014	It is desired that the Toll System Provider provide fully automated data archival and purging without the assistance of a staff member.		X
	Proposer Response: [redacted]		
	System Scalability		
SA-015	The Toll System Provider shall provide a communications bandwidth sufficient to handle all System functions and ensure the data collected by the Roadside System is accessible from the CSC and TOC in near-real-time. Near-real-time means the user actions can remotely access the TCS are of duration less than 2 seconds.	X	
	Note: The Proposer's Response shall include the expected response times to retrieve and view CCTV video, TCS images, and Transactions from a user in the CSC and TOC.		

Req ID	System Architecture (Section SA)	Required	Value Add
	Proposer Response: The Toll System Provider meets the SA- 015 technical requirement. . The communication network between the Toll Gantry and the Back Office System building as well as the Local Area Networks will be sized in order to make accessible the data collected by the RSS in near-real time. This communication network and LAN will provide the following response times: • < 2 seconds (under normal operating conditions) to retrieve and view CCTV video • < 2 seconds (under normal operating conditions) to retrieve and view TCS images • < 2 seconds (under normal operating conditions) to retrieve and view Transactions from a user		
SA-016	The TCS database management system shall be scalable to process at least five million (5,000,000) Transactions per day plus all associated ancillary messages without major architecture changes to the database management system.	X	
	Proposer Response: The TCS proposed by the TSP complies with requirement SA-016. The FastToll ERP™ BOS software solution has been designed to provide high availability and scalability without major architecture changes particularly for the Relational Database Management System (RDBMS). The software architecture uses SQL Server Service Broker, which supports the processing of multiple transactions in parallel. Transaction processing benchmarks of the FastToll ERP™ database management system far exceed the requirement of a least five million (5,000,000) Transactions per day. An independent audit measured our transaction processing (TP) and database (DB) performance at 269 transactions per second (tps), that's over 23 million transactions per day. Our E-ZPass interface software processes over 60 million tag and plate status updates per day.		
SA-017	The TCS storage shall be scalable to store at least five million (5,000,000) Transactions per day, which number is intended to include all Traffic Transactions, Financial Transactions and Event Transactions, without major architecture changes to the storage system for at least two (2) years of production.	X	
	Note: The Proposer shall size the system to work in accordance with the expected traffic based on information provided in the Traffic and Revenue Study provided to KYTC by Steer Davies Gleave. However, it is up to the Proposer to describe how the system will scale to meet this requirement. This could be done upon initial deployment or scalable as required through the term of the Contract to meet all Technical Requirements. **Proposer Response:** The TCS proposed by the TSP complies with requirement SA-017. The supporting IT Infrastructure of the FastToll ERP™ is built on leading edge technologies that provide high availability and scalability. For example, the Back Office System hosting infrastructure uses Hyper-V virtualization technology from Microsoft and i-SCSI SANs, both providing the ability to expand the memory capacity without any degradation in performance while providing server redundancy at each level: web front end, application, and database. It can easily store over 5,000,000 transactions per day for at least 2 years of production.		
SA-018	The TCS must retain Violation enforcement images and associated Transactions online in the BOS for two (2) years.	X	
	Proposer Response: The TCS proposed by the TSP complies with requirement SA-018. Violation enforcement images and associated Transactions will be available online in the BOS for two (2) years. After this time the images will be archived.		
SA-019	The TCS BOS shall be configured and sized to support at least fifty (50) concurrent users and shall also support a growth rate of 15% per annum without any degradation in performance.	X	
	Note: This requirement assumes that customers will only access the System from the Customer Website and customer access is not included in this Technical Requirement. **Proposer Response:** [redacted]		

Req ID	System Architecture (Section SA)	Required	Value Add
SA-020	The TCS shall provide load balancing in accordance with the RS, SA and BO sections of the Technical Requirements.	X	
	Note: The Proposer shall describe in this Technical Response Form the manner in which load balancing of the TCS will be provided, and how Proposer will describe such load balancing in the System Documentation. **Proposer Response:** The TCS proposed by the TSP complies with requirement SA-020. The TCS IT infrastructure will utilize Network Load Balancing (NLB) features for distributing traffic across multiple servers. NLB provides reliability and performance for web services and other TCS services. For example, the public website will be supported by multiple servers that distribute the load in a web farm configuration. The number of servers used in the web farm shall be established based on the expected number of simultaneous web users and requests. Additional servers can be added if the load increases. Network Load Balancing is a component of the Windows Server operating system. Servers are configured in an NLB cluster.		
SA-021	The TCS shall transmit and post to the BOS database available for reporting Financial, Traffic and Event Transactions in near-real-time between the Roadside System and the BOS. Near-real- time for this requirement is defined as Transactions sent from the Roadside System to the BOS not less frequently than within four (4) hours.	X	
	Note: The Proposer shall describe in this Technical Response Form how it will integrate the Roadside System and the BOS to receive and process all Transactions in near-real-time in the TCS. **Proposer Response:** [redacted]		

Req ID	System Architecture (Section SA)	Required	Value Add
	[redacted]		
SA-022	The Toll System Provider shall integrate all Transponder lists and Toll Rate Schedules in the TCS such that the BOS has a record copy of the Transponder list and corresponding Toll Rate Schedules for the time of the Traffic Transactions.	X	
	Proposer Response: The TCS proposed by the TSP complies with requirement SA-022. The FastToll ERP™ BOS is highly configurable, offering advanced Fare Management and E-ZPass non-financial file processing that includes Tag Status List (ITAG), Invalid Tag Customer File (IITC) and Customer License Plate File (ICLP) history tracking. All Toll Rate Schedules include an effective date so that the fare calculation algorithms use the appropriate schedule at the time of the traffic transaction. The E-ZPass interface software maintains a history of tag status and plate/tag association so that the transaction management process uses the correct status and plate information at the time of the traffic transaction, not just current information. All traffic transactions include the version number of the toll rate schedule (FareID) used to calculate the fare and filename of the source transponder list used to determine the tag status and if applicable the plate/tag association from the ICLP (used for creating iToll transactions).		
SA-023	The Toll System Provider shall provide full integration between the CSC and BOS, including but not limited to: association of all customer contacts with the customer account and association of detail regarding the customer contact with the customer account (for example, wrap codes, email, letters, lockbox operations, and ad-hoc authorized user entered information).	X	
	Proposer Response: The TCS proposed by the TSP complies with requirement SA-023. The CSC and BOS are fully integrated within the FastToll ERP™ system architecture. The Sanef BOS and CSC are essentially one software product. This allows CSRs of the Customer Service Center to have access to the customer account with, for example: • The telephone number of the customer when the customer calls the CSC Call Center. • The email address when the customer sends an email to the TSP CSC • The name of the customer when the CSR processes a mail or fax		
SA-024	The TCS shall provide graphical user interface (GUI) based applications that shall accommodate any authorized device connected to the System and application based on access roles and security levels.	X	
	Note: The Proposer shall provide in this Technical Response Form a list of all TCS applications that do not have a GUI. **Proposer Response:** The TCS proposed by the TSP complies with requirement SA-024. The TCS includes a GUI for the vast majority of required system functionality and accommodates any authorized device connected to the System and application based on access roles and security levels. The TCS applications that do not have a GUI are those implemented as services and SQL Server jobs. These processes are automated batch processes that run frequently on the system to update various aspects of the database. They are well-established processes and generally do not need tweaking. They include: • Rebill/Replenishment Process (the process that updates customer accounts when they are replenished) • Automated Correspondences (e.g., generation of bills and other correspondence) • Replenishment Analysis (analysis of customer account replenishment) • Financial Rollups (not the financial reporting—which is supported by the GUI—just the rollup process itself) • Violation Sweep Process (the process by which violations are detected) • Excessive video tolling Analysis (detecting hardware problems because a given lane is producing more video tolls than normal) Even for these processes, system users can review their functionality via a GUI: the execution history and logs of these processes are viewable using		

Req ID	System Architecture (Section SA)	Required	Value Add
	standard tools such as Windows event viewer and SQL Server Job Manager.		
SA-025	For any systems accessible by a commercial internet browser, the Toll System Provider shall provide secure browser-based system access and navigation for internal users and role-based access for external users using the latest version and the previous version of a web browser approved by the Joint Board. Acceptable web browsers include, but are not limited to the following: Microsoft's Internet Explorer, Mozilla Firefox, Google Chrome, Apple Safari iOs.	X	
	Note: The Proposer shall describe the supported browser versions in its Technical Response Form. **Proposer Response:** The TCS proposed by the TSP complies with requirement SA-025. The FastToll ERP™ Back Office System software solution has been designed to provide secure browser-based system access and associated navigation for internal users and role-based access for external users. The web browsers supported include, but are not limited to the latest and previous version of Microsoft's Internet Explorer (from version 6.0 and higher)., Mozilla Firefox (from version 3.0 and higher), Google Chrome (from version 10 and higher) and Apple Safari iOs (from version 4.0 and higher).		
SA-026	The Toll System Provider shall provide secure browser-based access and navigation of the Customer Website for Project customers using the latest version and the previous version of a web browser approved by the Joint Board. Acceptable web browsers include, but are not limited to the following: Microsoft Internet Explorer, Mozilla Firefox, Google Chrome, Apple Safari iOs.	X	
	Proposer Response: The TCS proposed by the TSP complies with requirement SA-026. As for internal users, The FastToll ERP™ Back Office System software solution has been designed to provide secure browser-based system access for the Project Customers through the Customer Website using the latest version and the previous version of web browsers such as Microsoft's Internet Explorer (from version 6.0 and higher)., Mozilla Firefox (from version 3.0 and higher), Google Chrome (from version 10 and higher) and Apple Safari iOs (from version 4.0 and higher).		
SA-027	The TCS shall provide the following regarding web navigation: 1) self-service navigation that is optimized for speed regardless of the web browser used; 2) the capability to detect and report errors if the browser used to access the Customer Website is outdated or not supported; and 3) paginate content in various ways corresponding to differences in device characteristics.	X	
	Proposer Response: The TCS proposed by the TSP complies with requirement SA-027. The FastToll ERP™ Back Office System software solution including Customer Web site has been designed to optimize the web navigation speed for all browsers and users (internal and customers). The Web Site detects if the browser used by the customer is not supported and sends an error message. Moreover, according to the browser and the OS of the Customer device, the website paginates contents accordingly. Finally, the website is designed to meet the Web Accessibility Initiative's Priority Level AA. Disabled persons using text-only browsers or other assistive technology will be able to read the content on the page, including text descriptions for all images.		
SA-028	The Customer Website shall be 1) accessible to mobile devices irrespective of differences in presentation capabilities and access mechanism; and 2) accessible on a range of mobile devices, including but not limited to: smart phones and tablets.	X	
	Proposer Response: [redacted]		

Req ID	System Architecture (Section SA)	Required	Value Add
	[redacted]		
SA-029	The TCS Customer Website shall support the latest versions of mobile operating systems, including but not limited to: Apple's Safari iOs, Android operating system, Windows operating system, BlackBerry operating system.	X	
	Note: The Proposer shall describe the supported versions in its response. **Proposer Response:** The TCS proposed by the TSP complies with requirement SA-029. The Customer Website of FastToll ERP™ is accessible to mobile devices using the following operating systems: Apple's Safari iOs 4 version or higher, Android version 2.2 or higher, Windows Phone version 8.0 or higher, and BlackBerry version 5.0 or higher.		
SA-030	Any original Financial Transaction, Traffic Transaction or Event Transactions entered in the System shall only be modified in the System or deleted as necessary to move Transactions to long term storage in accordance with the archive requirements. Any updates to the data associated with any message shall be traceable to the original records.	X	
	Proposer Response: [redacted]		
SA-031	Any manual intervention required shall be only by authorized users and a full audit trail of such manual intervention shall be provided with appended records within the TCS.	X	
	Proposer Response: The TCS proposed by the TSP complies with requirement SA-031 Only users with the necessary privileges are authorized to manually modify or delete information in the Toll Collection System records. All such intervention is recorded; no records can be deleted, as specified above in SA-030, and all such interventions can be traced in the System for possible further auditing.		
SA-032	All confidential data (e.g. passwords, authorized user names and access rights) and Personally Identifiable Information shall be encrypted.	X	
	Proposer Response: [redacted]		

Req ID	System Architecture (Section SA)	Required	Value Add
	[redacted]		
SA-033	The TCS shall provide access privileges for different levels of user authorization which shall be fully configurable by a System administrator.	X	

Req ID	System Architecture (Section SA)	Required	Value Add
	Proposer Response: [redacted]		
	System and user configurable parameters		
SA-034	It is desired that the TCS shall have access levels and user roles of the entire TCS controlled solely through a graphical user interface.		X

Req ID	System Architecture (Section SA)	Required	Value Add
	Proposer Response: [redacted]		
SA-035	The TCS shall provide the functionality to create, manage, store and automatically transmit the then-current Toll Rate Schedules (including toll rate schedules for special events), per Toll Zone, by authorized users. The TCS shall create an audit trail that logs when the rates were configured, the user making the change in the System and the time at which the rates were effective.	X	
	Proposer Response: [redacted]		

Req ID	System Architecture (Section SA)	Required	Value Add
	[redacted]		

Req ID	System Architecture (Section SA)	Required	Value Add
	[redacted]		
SA-036	The TCS shall provide a default rate table for all Toll Zones when no Toll Rate Schedules can be found. The toll rate values in the default rate table shall be approved by the Joint Board.	X	
	Proposer Response: The TCS proposed by the TSP complies with requirement SA-036. The TCS includes a default rate schedule. When no other schedule is specified by the Joint Board, the system uses this default schedule. This default schedule also can be updated.		
SA-037	The TCS shall provide storage capacity thresholds which shall trigger alarm messages to be generated by and logged into MOMS. These thresholds shall be configurable between 0% and 100%.	X	
	Proposer Response: [redacted]		

Req ID	System Architectu		Required	Value Add
		[redacted]		
SA-038	The TCS shall be configurable based upon a confidence rating for video image processing transactions.		X	
	Proposer Response: The TCS proposed by the TSP complies with requirement SA-038. Where toll transactions are posted to customer accounts, FastToll ERP transaction management process offers the ability to configure the process to optimize the number of transactions that go to manual image review. The confidence level of the Optical Character Recognition (OCR) algorithm, under which images are sent to manual review, is fully configurable. In addition to configuring OCR confidence thresholds, other features in transactions processing can be configured, such as timing thresholds by which duplicate transactions are filtered out. The business logic for this process can also be optimized for comparing roadside vehicle classification information, second OCR algorithm results, and front/rear license plate comparisons (for states/vehicles that have front license plates). This gives Sanef the ability to tune the system in a way that gives extremely high performances, complying with the performance requirements as specified in the PR response.			
SA-039	The Toll System Provider shall provide a TCS with a disaster recovery system including facilities, Hardware, and Software that will ensure that the TCS continuously meets all availability performance guarantees set forth in TR Section PR. The TCS shall allow for continued use of the CSC, Roadside System		X	

Req ID	System Architecture (Section SA)	Required	Value Add
	and BOS in degraded mode whenever necessary.		
	Proposer Response: [redacted]		
SA-040	The TCS shall recover all Mission Critical Systems of the TCS within 4 hours of the time of failure. The TCS shall recover all Business Critical Systems of the TCS within 8 hours of the time of failure.	X	
	Note: The Proposer shall provide in this Technical Response Form the existing Disaster Recovery System Plan for the TCS which includes a list and description of all Mission Critical Systems and Business Critical Systems and operational steps to make each system operational.		

Req ID	System Architecture (Section SA)	Required	Value Add
	Proposer Response: The TCS proposed by the TSP complies with requirement SA-038. The TCS will recover all Mission Critical Systems of the TCS within **four** (4) hours of the time of failure. The TCS will recover all Business Critical Systems of the TCS within **eight** (8) hours of the time of failure. The table of Contents of the existing Disaster Recovery Plan is given hereafter (POC Primary Operation Center / SOC Secondary Operation Center): *1. GENERAL* *1.1. Reference & Applicable Documents* *1.2. Figures* *1.3. Abbreviations & Acronyms* *1.4. Methodology, Tools & Techniques* *2. INTRODUCTION* *3. POC HYPER-V CLUSTER & SOC HYPER-V HOSTS* *3.1. Back Office Overview* *3.2. POC Hyper-V Cluster* *4. SCENARIOS OF THE OPERABILITY OF THE POC AND SOC* *4.1. Failure of a POC Clustered Host* *4.2. Failure of a POC Physical Server Not in the Cluster* *4.3. Complete Site Failure of a POC (POC to SOC fail-over)* *4.4. Failure of a SOC Host* *4.5. Complete SOC Site Failure* *4.6. POC /SOC Communication Link Failure* *4.7. Failure of One SOC Host* *4.8. Failure of a Non Hyper-V Host* *5. FAILOVER AND THE DMZ LAYER* *6. FAILBACK FROM THE SOC TO THE POC* *7. DOCUMENT CONTROL*		
SA-041	The Toll System Provider shall provide a disaster recovery site that shall be located at least 100 miles from all of the TCS Sites used for the Project.	X	
	Proposer Response: The TSP will comply with the requirement SA-041. The Secondary Operation Center will be implemented in the Disaster recovery Site located beyond one hundred (100) miles from all the TCS Sites used for the Project.		
SA-042	The Toll System Provider Disaster Recovery System Plan shall ensure no data will be lost prior to, during and after a disaster.	X	
	Note: The Proposer shall describe in this Technical Response Form how its' Disaster Recovery System Plan will prevent loss of any data in case of a disaster. **Proposer Response:** [redacted]		

Req ID	System Architecture (Section SA)	Required	Value Add
	[redacted]		
SA-043	The Toll System Provider shall ensure that the application and use of the ETC Components complies with all applicable FCC regulations. The Toll System Provider shall secure a FCC site license for each Toll Zone on behalf of the Joint Board. The FCC site license shall be transferred to the Joint Board no later than 60 days after Revenue Service for each Bridge.	X	
	Proposer Response: The TSP will comply with the requirement SA-043. We will comply with all FCC regulations, and apply for an FCC license for each Toll Zone on behalf of the Joint Board. We will transfer the license to the Joint Board no later than sixty (60) days after Revenue Service for each Bridge.		
SA-044	The Toll System Provider shall install, configure, test, and integrate the ETC Components into the Roadside System and ensure that they are operational and meet all functional and Performance Requirements.	X	
	Note: The ETC Component includes all components in Exhibit L required by the Toll System Provider to operate the TCS at the Performance Requirements. The Joint Board has secured a Contract with the ETC Contractor to provide technical support as necessary during the Term of the Contract.		

Req ID	System Architecture (Section SA)	Required	Value Add
	Proposer Response: [redacted]		
SA-045	The Toll System Provider shall provide ICDs including an interface test plan in the Master Testing and Commissioning Plan (see TR Section TP for plan requirements) for all single and two-way external interfaces including, but not limited to: a) Interoperable agencies b) Transponder statuses c) Mobile devices d) Cash bank(s) e) Credit card payments f) Court(s) g) Collection agency(s) h) Walk-up Centers i) Traffic management center(s) j) Transponder management k) Retail outlets and kiosks l) Legal entities (for persons of interest) m) Mail address skip-tracing service n) Indiana and Kentucky DMV o) Third party suppliers (e.g. out-of-state registered owner look-up)	X	
	Note: The Proposer shall provide a list of all ICD's in this Technical Response Form. All actual ICD's shall be included in the Master Testing and Commissioning Plan. **Proposer Response:** The TSP will comply with the requirement SA-045 and will provide ICDs as well as an interface test plan in the Master Testing and Commissioning. ICDs to be provided are: a) Interoperable agencies (E-Z Pass Agencies) f) Court(s) k) Retail outlets and kiosks b) Transponder statuses g) Collection agency(s) l) Legal entities (for persons of interest) c) Mobile devices h) Walk-up Centers m) Mail address skip-tracing service d) Cash bank(s) i) Traffic management center(s) n) Indiana and Kentucky DMV e) Credit card payments j) Transponder management o) Third party suppliers		
SA-046	The ICD shall provide for a message level interface. It shall include protocols used in the interface, a brief concept of operations that describes how the messages are used, the related Business Rules and all networking and interface requirements including network diagrams. The ICDs shall include interface test procedures that describe all aspects of the interface testing and validation of each test requirement.	X	
	Note: The Proposer's response shall include a sample ICD for the Project. **Proposer Response:** [redacted]		

Req ID	System Architecture (Section SA)	Required	Value Add
	[redacted] does not match with the expected on, then the file will be rejected.		

Req ID	System Architecture (Section SA)	Required	Value Add
	[redacted]		

Req ID	System Architecture (Section SA)	Required	Value Add
	[redacted]		

Req ID	System Architecture (Section SA)	Required	Value Add
	[redacted]		
SA-047	The TCS shall generate files to transmit, receive and process information with multiple registered vehicle owner look-up service providers and DMVs via electronic interface portals provided by the Toll System Provider. It is desired that if the registered driver information is available in addition to the registered owner information, this information be provided by the Toll System Provider.	X	
	Note: The Proposer's response shall indicate the states with which the Proposer has an existing relationship and the costs associated with a look-up by state. Note: Registered driver information may be used in the case of lease or fleet vehicles. **Proposer Response:** The TCS proposed by the TSP complies with requirement SA-047.The Sanef BOS is designed to easily integrate multiple registered vehicle owner look-up service providers and DMVs. It generates files and receives files electronically from vehicle owner look-up services and DMVs. Sanef has relationships with DMVs in all 50 states through third-party service providers. We are also the technology provider of the Alliance for Tolling Integration (ATI) Hub, which plans on providing inexpensive DMV look-up services through a centralized American Association of Motor Vehicle Administrators (AAMVA) database. If registered driver information is available, we will record it, use it in the case of lease/fleet vehicles, and provide it as appropriate.		
SA-048	The TCS shall generate reports that detail all interoperable Transactions sent and received from or to the interoperable agencies.	X	
	Proposer Response: The TCS proposed by the TSP complies with requirement SA-048. There is no other company in the world that has more knowledge and experience in running Tolling Interoperability schemes than Sanef. From E-ZPass in the US, to EETS in Europe, the extensive range of our offerings in interoperability is unmatched. Sanef operates facilities and has provided systems that participate in these interoperability schemes: • E-ZPass Group in the USA • CTOC in California • EETS with EuroToll • IEA in Dublin, Ireland • RNUT in Chile • Alliance for Toll Interoperability (ATI) in the United States LSIORB will participate in E-ZPass interoperability network, which comprises 24 tolling agencies in 14 US states and member agencies exchange $2.6 billion in tolls each year, with robust and accurate reporting capabilities and strong audit trails. Tag and Plate status files contain over 60 million records. The benefit of all Sanef's experience and installed base is that the FastToll ERP can participate in multiple interoperability schemes, providing the one account, one invoice concept for toll road users that want to participate in these services. The System Interoperability Interface utilizes secure protocols to exchange data		

Req ID	System Architecture (Section SA)	Required	Value Add
	files between the toll facilities. Sanef's system will generate reports that include the details of all interactions with interoperability facilities as follows: The following files and reports are sent to other CSCs/Agencies: • Home Tag Status File (ITAG), Invalid Tag Customer File (IITC) and Customer License Plate File (ICLP) • Transaction File of away customers travelling on home network (ICTX) • Transaction File Reconciliation (for home on away transactions) (ICRX) • IAG-2, 2R, 3, 3R, 6 and Settlement Statements The following files and reports are received from other CSCs/Agencies: • Away Tag Status File (ITAG), Invalid Tag Customer File (IITC) and Customer License Plate File (ICLP) • Transaction File of home customers travelling on away network (ICTX) • Transaction File Reconciliation (for home on away transactions) (ICRX) • IAG-2, 2R, 3, 3R, 6 and Settlement Statements		
SA-049	The Toll System Provider shall provide a fully functional TCS network from the Toll Zones to the BOS. The proposed architecture shall use an existing communications service provider to provide "last mile" infrastructure (e.g. conduits and cable) and network connectivity from the toll equipment pad to an existing fiber optic commercial network owned by a commercial carrier. The Toll System Provider shall contract with a local communications service provider to provide data communications, including all necessary fiber cables and network equipment, from the Toll Zones to the local data center to be approved by the Joint Board. The Toll System Provider shall provide connectivity from the Toll Zones to an existing commercial service and back to a local data center that supports multiple internet service providers. The Toll System Provider shall connect its BOS with other supported external services (e.g. Walk-up Center, lockbox, and retail distribution centers) using commercial internet service providers. The high level architecture is described in Attachment C-1 of the Technical Requirements. The Toll System Provider shall comply with the architecture specified in Attachment C-1 or an alternative architecture approved by the Joint Board in its sole discretion.	X	
	Note 1: If the architecture specified in SA-0049 and Attachment C-1 does not work with the Proposer's system, the Proposer shall propose in this Technical Response Form an alternative approach and architecture. Note 2: The Proposer shall identify the Internet Service Provider that TSP expects to use to connect the proposed remotely located BOS to the Roadside System and local network hub, and the bandwidth requirement for 100,000 ADT Traffic Transactions including all images, video and data necessary to operate the TCS in this Technical Response Form. In Attachment C-1 this is identified as Segment 2 on the diagram. Note 3: The Proposer shall identify the bandwidth requirements for Segment 1, which is defined as the communications link between the Toll Zones and communication service provider data center, and Segment 2, which is defined as the communications link between communications service provider data center and the Proposer's BOS in this Technical Response Form. **Proposer Response:** [redacted]		

Req ID	System Architecture (Section SA)	Required	Value Add
	[redacted]		
SA-050	The Toll System Provider shall manage and be responsible for all elements of the network communications in the TCS. The actual, direct costs charged by the data communications service provider to TSP shall be billed to the Joint Board as a “Pass-Through Cost Item” without any mark-up. The Toll System Provider shall manage the identification and repair of any communications outages. The Toll System Provider shall require a monthly report from the network communications service provider that will be distributed to the Joint Board in the Monthly Operations and Maintenance Report. The content of the reports and all service level requirements will be negotiated after contract award. The Toll System Provider shall contract directly with the communications service provider for a 3 to 5 year contract on terms and conditions approved by the Joint Board, in its sole discretion.	X	
	Proposer Response: The TSP will comply with SA-050 requirement. The TSP will assume all responsibility of the TCS communications network including a contract for at least three (3) years terms with a communication service provider for data communications between the Toll Zones and the local data center.		

Req ID	System Architecture (Section SA)	Required	Value Add
	We will identify network outages and fix them ourselves, or request that the communications provider fix them, as appropriate. We will obtain a monthly report from the communications provider, which we will include in our monthly O&M report. We will discuss contents of this report with the Joint Board, and then forward the request on to the data communications provider. The actual, direct costs charged by the service providers to TSP will be billed monthly to the Joint Board as a "Pass-Through Cost Item" without any mark-up.		
SA-051	The Toll System Provider shall provide, update and maintain a Data Mart for the TCS that shall be available to and accessible by the States' Parties at all times from and after six months prior to the first Tolling Readiness Deadline. The Data Mart shall include ETC and license plate transaction data and ETC and license plate account data from the Roadside System, BOS and CSC in its native format and not aggregated to summary level data. The MOMS work orders and system tickets shall also be made available in the Data Mart. The purpose of this Data Mart is for the States' Parties to develop States' Parties' reports outside of the TCS.	X	
	Proposer Response: The TCS proposed by the TSP complies with SA-051 requirement. For reporting, the FastToll ERP™ uses Business Intelligence (BI) tools and technologies that include extract, transform, and load (ETL) packages, change data capture (CDC), and multidimensional database design in order to populate the Data Warehouse and Data Marts with native format data which will be made available and accessible by the States' Parties. The Data Warehouse includes Work Orders and system tickets from the MOMS, as well as the all ETC and image-based transaction and account data from the roadside system, BOS, and CSC in its native format. The reporting portal, called SQL Server Reporting Services (SSRS) provides off-the-shelf features for scheduling reports, delivery options, snap-shots, and ad hoc reporting. The underlying dimensional database store design supports ad hoc queries and reports for obtaining financial, traffic, and revenue data. The reporting portal provides a suite of built-in financial, operational, and audit reports.		
SA-052	The Data Mart shall provide for the use of an Extract Transfer Load (ETL) with a full written data dictionary of the TCS data or a separate copy of the data to be replicated by the States' Parties for their own reporting.	X	
	Note: States' Parties may retrieve this data using one methodology or two separate methodologies as described below. Alternative 1 is to provide a copy of the database management system for the States Parties to use the data within the Data Mart. Alternate 2 is the use of an Extract Transfer Load (ETL) tool. The Toll System Provider shall accommodate both methodologies of retrieving this data from a specified operational database within the TCS. **Proposer Response:** The TCS proposed by the TSP complies with requirement SA-052. Our TCS supports both methods of external access to the Data Marts described here: using a tool to access the Data Marts externally; or providing a full copy/extract of the data to the states. For example, our Port Mann Data Warehouse allows both: • The States' Parties to have access to the Data Mart using the tools provided by the TSP (SQL Server Report Builder); and • The States' Parties to use an external ETL (of their choice) to extract data from the Data Mart.		
SA-053	For the ETL method, the Toll System Provider shall provide all data available in the TCS to the ETL to be accessed by the States' Parties no less frequently than every 24 hours. The Proposer shall provide this capability no later than six (6) months prior to the first Tolling Readiness Deadline.	X	
	Note: The Proposer shall identify in this Technical Response Form the maximum frequency that the data may be retrieved from the System. **Proposer Response:** The TCS proposed by the TSP complies with requirement SA-053. We will provide the capability to access data available in the TCS to the ETL to be accessed by the States' Parties no less frequently than every 24 hours. This capability will be effective no later than six (6) months prior to the first Tolling Readiness Deadline. The maximum frequency that the data may be retrieved from the System depends mainly on the volume of the data to be retrieved from the System. As an example, in Port Mann, the frequency is • Every hour for the quantity of Image review during the elapsed hour, • Every day for the Daily Traffic data, and • Every month, for the billing and other accounting data.		

Roadside Requirements

Req ID	Roadside Requirements (Section RS)	Required	Value Add
RS-001	The Toll System Provider shall provide a Roadside System that accurately detects, classifies, rates and reports vehicles. The major function of the Roadside System is to accurately detect, classify and identify every vehicle passing through Toll Zones including the bi-directional lanes. The TCS shall provide the following functions of the Roadside System: 1. Detect, classify and rate vehicle Traffic Transactions in accordance with accuracy requirements and Performance Requirements; 2. Provide backup and archiving functions; 3. Operate in degraded modes with redundancy; 4. Be audited from BOS to individual lane Traffic Transaction records; and 5. Be a single source of toll collection data. The TCS shall generate a Traffic Transaction for every vehicle passing through any Equipment Lane of the Toll Zone. The Toll Zone shall accurately read Transponders, capture license plate images and classify vehicles anywhere in the Toll Zone between the left edge of the left shoulder and the right edge of the right shoulder, unless otherwise directed by the Joint Board.	X	
	Proposer Response: [redacted]		

Req ID	Roadside Requirements (Section RS)	Required	Value Add
[redacted]	[redacted]	[redacted]	[redacted]
RS-002	The TCS shall implement axle based toll rates for specific Toll Zones and specific lanes. Rates set by the Joint Board may vary by time of the day and classification. The TCS shall classify vehicles into at least ten unique classifications without the Joint Board incurring additional charges from the Toll System Provider. The Toll System Provider shall provide an axle vehicle classification system that is based upon FHWA vehicle classifications. The vehicle classification shall be mapped by axle classes to the classifications below as specified during the Business Rules. The TCS shall provide, at a minimum, the following rating categories: 1. By vehicle class, from lowest to highest: a. Class 1 (car), b. Class 2 (small truck), and c. Class 3 (large truck) 2. By type of Transaction: a. Transponder with discount based upon a specified number of trips for a specified period of time (Class1 only), b. Transponder,	x	

Req ID	Roadside Requirements (Section RS)	Required	Value Add
	c. Registered Video, and d. Unregistered Video 3. By other variables such as time of day. The TCS architecture shall support congestion pricing functionality from an external congestion pricing system in the future if required by the Joint Board.		
	Proposer Response: The TCS proposed by the TSP complies with RS-002 as follows: The AVDC (Automatic Vehicle Detection and Classification) system of FastFlow™ is a combination of the measurement of the vehicle dimensions with a laser scanner system and axle counting equipment based on inductive loops. The AVDC system integrates and combines data from the two complementary technologies, comprising laser scanners and inductive loops, to provide greater accuracy than the system could provide with only one of the two technologies: • Laser scanners ✓ Calculate height, width, length and speed of vehicles; ✓ Work at full performance in almost all weather conditions; and ✓ Are highly reliable. • Inductive loops: ✓ Calculate the number of axles of vehicles; and ✓ Are highly reliable. Having two different subsystems for vehicle detection and classification provides improved global performance of the system and high availability: • Redundant sources for vehicle detection and camera triggering: each vehicle entering the system will be detected by both subsystems (loops and lasers). In case of malfunction of either subsystem, the vehicle will still be detected, and camera triggered, by the other subsystem. • Optimal performance in challenging traffic and weather conditions: in severe weather, the laser may not perform as well, but loop performance is not impacted. Conversely, in case of bumper-to-bumper traffic causing several vehicles to cross a loop nearly as one unit, the loop can have difficulties differentiating vehicles, but the laser makes the separation perfectly. Thus the combination of the laser and loops ensure the system works in all weather conditions (including heavy rain, snow, dense fog) and any kind of traffic (from free flow to bumper to bumper). • Greater accuracy due to having different criteria for classification: laser classification is based on three-dimensional vehicle profile analysis, while loops classification is based on inductive signature analysis and axle counting. Because the methods evaluate different vehicle characteristics, their combination helps brings greater classification accuracy. The FastFlow™ AVDC system has been designed to readily classify vehicles into at least ten unique categories. Vehicle class is part of the Traffic Transaction constructed in the Gantry Controller after a vehicle has passed through any Equipment Lane of the Toll Zone. The Gantry Controller sends this Traffic Transaction to the Back Office System. The AVDC system is illustrated in the diagram of the side view of the Roadside system included in the response to RS-001 above. In the Back Office System, Traffic Transactions are processed by the Transaction Management module of FastToll ERP™ whose primary responsibilities are: • Validating passage transactions received from the Roadside System; • Determining, for each transaction, the correct class of the vehicle based on data received from the Roadside System; • Determining whether the transaction should be sent to manual review, in order to manually check the license plate number read by OCR; • Determining whether the journey is made by a registered or unregistered vehicle, based on the license plate and/or transponder data collected at the Roadside System level, and choose the correct fare for this journey; and • Post the financial charge linked to this journey (Traffic Transaction) on the correct customer account, including unregistered accounts for vehicles not registered in the system.		

Req ID	Roadside Requirements (Section RS)	Required	Value Add
	The BOS will create an axle classification of the vehicle based on FHWA classifications. This is currently implemented in our Rhode Island system. It will also be capable of classifying all transactions into at least the 10 classifications. More classifications are possible—we will discuss possibilities with the Joint Board during business rule discussions.		
RS-003	The Toll System Provider shall ensure that no Traffic Transactions are lost and shall provide reports and the capability to check Traffic Transaction sequence numbers for purposes of audit and review. Transaction sequence number gaps shall be flagged by the BOS and reported by an alarm in MOMS.	X	
	Proposer Response: The TCS proposed by the TSP complies with RS-003 as follows: The Gantry Controller of the FastFlow™ solution inserts a unique transaction number in each Traffic Transaction immediately after a vehicle has passed through any Equipment Lane of the Toll Zone. The unique transaction number is achieved by combining date and time, incremental sequence number, and Gantry Controller Identifier. These unique transaction numbers allow for a complete audit trail and review. The consistency check of the transaction number is made by the Transaction Management module of FastToll ERP™. If the system detects a gap in the incremental sequence number, it flags the transaction and creates an alarm in MOMS.		
RS-004	The Toll System Provider shall have a Second Source Hardware Plan for all Roadside System equipment, including functionally equivalent second sources for any equipment for which a direct second source is not available.	X	
	Note: The Proposer shall describe its Second Source Hardware Plan and list all second source Major Spare Parts in the Technical Response Form. The Proposer shall note any Roadside System Equipment that does not have a second source. **Proposer Response:** The TSP complies with RS-004 as follows: We will compile a Second Source Hardware plan. The Joint Board will be free to inspect the plan once it is ready (once the design is finalized). We can discuss dates for this with the Joint Board during business rules discussions. Because the design of FastFlow™ is modular and based on Line Replaceable Unit (LRU) concept, not all Roadside System Equipment will have a direct second source. Instead, many different second sources are possible for some pieces of the roadside equipment, taking advantage of innovations that become available in the roadside market, and making the system more robust than systems that have only two possible sources. Thus, the Second Source Hardware Plan provided as part of this requirement will list some functionally equivalent second sources for each Line Replaceable Unit of the Roadside System, will describe how to identify functionally equivalent second sources, how to test and select them, how to ensure their availability periodically. Sanef will maintain at least one spare for each Line Replaceable Unit (LRU) of the Servers/Gantry Controller, Switches, Cameras, Lasers, and Inductive Loops installed in the Roadside System. Further details on spare parts are provided in the requirements that respond to the spare parts. There are no pieces of roadside equipment without a functionally equivalent major second source.		
RS-005	It is desired that a second source be provided for all Hardware. If a second source is not available for Major Spare Parts, a functional equivalent shall be included in the list provided in accordance with RS-004, which shall include a functionally equivalent second source if a direct second source is not available. The list shall include the components' primary functions in the roadside, make, model number and any other pertinent information.		X
	Proposer Response: The TSP complies with RS-005 as follows: Sanef has adopted a Line Replaceable Unit (LRU) strategy. In the constantly evolving worlds of Information Technology and Intelligent Transportation System, Sanef feels it is best to utilize the latest hardware as it enters the market. Sanef constantly monitors the market and chooses the best products from each new generation of sensor and server. Thus, we cannot currently provide the exact make and model information for the roadside equipment that we would install at the LSIORB bridges, or the make and model for the secondary sources. Currently, the list or primary source suppliers and secondary source suppliers is as follows. Again, we are not providing model numbers since the precise model numbers will certainly change between now and the time we start installing the equipment for LSIORB: **Line Replaceable Unit** | **First Source (used in primary system)** | **Second Source** Servers/Gantry Controller | Dell | Hewlett Packard		

Req ID	Roadside Requirements (Section RS)	Required	Value Add
	Switch: CISCO / Dell Camera: Survision / 3M / PIPS Laser: SICK / OSI Laserscan Inductive Loop: 3M / IDRIS / Northstar Controls		
RS-006	The Toll System Provider shall provide a separate Roadside System for each direction of traffic at the Toll Zones.	X	
	Proposer Response: The TSP will comply with RS-006 requirement. A separate Roadside System will be provided for the four toll zones: • Downtown Crossing Northbound (New Downtown Crossing), • Downtown Crossing Southbound (Kennedy Bridge), • East End Crossing Northbound, and • East End Crossing Southbound.		
RS-007	The Roadside System shall run independently of the BOS and continue to build Traffic Transactions if communications are disrupted. .	X	
	Proposer Response: The TCS proposed by the TSP complies with RS-007 as follows: The FastFlow™ Roadside System, is totally standalone, i.e., absolutely independent of the Back Office System. In the event of a communications failure with the Back Office System, the Gantry Controller continues to store the Traffic Transactions on the local hard drive. The Gantry Controller will be designed to have sufficient capacity to store the all Traffic Transactions for one month based on traffic projections. The stored Traffic Transactions will be uploaded automatically once network communications are recovered. The Traffic Transactions can, at any time, be downloaded off the Gantry Controller via a secure laptop used by a system user with appropriate security authorization.		
RS-008	The Roadside System shall immediately build the Traffic Transaction with the information available, and shall operate in a degraded mode if some components are not functioning so that Performance Requirements are met.	X	
	Note: The Proposer shall indicate in its response the number of ETC readers, if any, over the number specified in Exhibit L that will be necessary for Proposer to meet this requirement. **Proposer Response:** The Roadside System proposed by the TSP complies with RS-008 as follows: It detects, classifies and identifies every vehicle passing through Toll Zones including the bi-directional lanes and generates a Traffic Transaction for every vehicle immediately after the vehicle passes through any Equipment Lane of the Toll Zones. To meet all Performance Requirements, all the single points of failure are identified, and the following steps are taken to introduce redundancy in the system: • For each function of the Roadside System (AVI, AVDC, ANPR), the number of sensors is calculated to cover space beyond the lane width, i.e., with a sufficient overlap with the adjacent lane in order to avoid any loss of data when one sensor becomes faulty. In other words, there will be no degradation of the system performance if one sensor fails. • Each server of the RSS is redundant, i.e., for the same functionality, there are two servers. If one fails, the other one takes over, and an alarm is created • We will have a second, redundant, data link between the roadside and the Back Office System provided by a second local Communications Service Provider. In other words, we will have two sets of fiber running to each toll zone). Based on our experiences with the Kapsch E-ZPass ETC readers we believe that the number of ETC readers specified in Exhibit L is sufficient to meet this requirement. However, the roadside configuration of the Kapsch readers for this project specifically may require that Sanef adjust the number of readers used to meet the performance requirements.		
RS-009	The Toll System Provider shall provide a complete Roadside System, with ETC, AVC and Image Processing System, on all Equipment Lanes in the Toll Zone.	X	
	Note: The Equipment Lane quantities in Form G - Price Proposal of the ITP reflect this requirement.		

Req ID	Roadside Requirements (Section RS)	Required	Value Add
	Proposer Response: [redacted]		
RS-010	The Toll System Provider shall provide the network connections between Toll Zones and the BOS. The Toll System Provider shall comply with the System architecture requirements for data communications architecture and all other Technical Requirements when configuring and implementing the network system.	X	
	Proposer Response: The TSP will comply with RS-010 as follows: The TCS includes all network connections between the Toll Zones and the BOS, and complies with all System Architecture requirements for Data communications and other relevant Technical requirements. Refer to the answer of the SA-049 requirement for more details on the data communications architecture.		
RS-011	The Toll System Provider shall size the communication link to handle all functions of the Roadside System and make the information available at the BOS, CSC and TOC in near-real-time. Near-real-time is defined as access to the Roadside System applications and data displayed from the BOS, CSC, TOC and from a VPN within 2 seconds.	X	
	Note: The Proposer shall provide in this Technical Response Form a network WAN diagram and LAN diagram for network communications between the Toll Zones, toll equipment cabinets and BOS. **Proposer Response:** [redacted]		

Req ID	Roadside Requirements (Section RS)	Required	Value Add
[redacted]	[redacted]		

Req ID	Roadside Requirements (Section RS)	Required	Value Add
	[redacted]		
RS-012	The Joint Board will provide the Toll System Provider with a toll equipment site as shown in Attachment C-2. A 120/208 VAC commercial power service meter, provided by others, will be terminated at the equipment pad provided by others. Data communication conduits and a pull string will be provided by others from the toll equipment to the Toll Zone gantry. The final locations of the pads are being reviewed and are not yet final, but it is expected that the toll equipment pads will be within 330 linear feet of the Toll Zone gantry. The Toll System Provider shall provide all cabling and terminations for all data and power between the toll equipment pad and the Toll Zone gantry. A network connection from the toll equipment pad to a commercial service provider shall be provided by the Toll System Provider.	X	
	Note: Toll System Provider's architecture may include Toll Gantry mounted equipment. **Proposer Response:** The TSP complies with RS-012 as follows: The TSP will install • the Generator and the Cabinets housing ETC Equipment, Servers, and LAN equipment on the Toll Equipment Area; • the cabling and terminations between the 120/208 VAC commercial power service meter and the Toll Equipment Area Cabinets as well as between the Toll Equipment Area Cabinets and the Toll Zone gantry via power conduits provided by others; and • the cabling and terminations of the Roadside System LAN network between the Communication Service Provider and the Toll Equipment Area Cabinets as well as between Toll Equipment Area Cabinets and the Toll Zone gantry via Data communication conduits provided by TPS.		
RS-013	The Toll System Provider shall provide a Roadside System with a minimum operational lifecycle of 10 years.	X	
	Note: The Toll System Provider shall specify the proposed Roadside System's operational lifecycle in this Technical Response Form. **Proposer Response:** The TSP complies with RS-013 as follows: The proposed Roadside System's operational lifecycle is ten (10) years. To meet this timeframe requirement the system will be maintained by the TSP with spare parts for all hardware provided under the contract. The software will be maintained by the TSP and kept operational through regular updates preventive maintenance practices.	.	
RS-014	[Intentionally not used.]		
RS-015	All components of all equipment shall be modular in nature for maintenance, testing, and replacement purposes. All components shall be designed such that they are easily accessible with hand tools by maintenance technicians as needed.	X	
	Proposer Response: The TCS proposed by the TSP complies with RS-015 as follows: The FastFlow™ tolling system was designed in order that each component within the system is modular. As such, when maintenance actions are required to replace or carry out maintenance on specific components, this can be performed on-site with hand tools by maintenance technicians without having to return the components to a maintenance facility. Typically this ensures that maintenance actions do not require specific tools. Each component is considered as a Line Replaceable Unit.		
RS-016	It is desired that equipment enclosures, mounting Hardware, washers, brackets, screws, bolts and nuts exposed to the outdoor environment shall be constructed of American Iron and Steel Institute Type 316L grade stainless steel where possible.		X

Req ID	Roadside Requirements (Section RS)	Required	Value Add
	Proposer Response: The TSP complies with RS-016 as follows: We will ensure that all equipment enclosures, mounting Hardware, washers, brackets, screws, bolts and nuts exposed to the outdoor environment are procured with the guarantee, to the extent possible, that they are constructed of American Iron and Steel Institute Type 316L grade stainless steel.		
RS-017	The Roadside System shall provide lightning and other surge protection such that the equipment can continue to perform without impact on normal functions during an electrical surge on the System. The Toll System Provider shall provide its surge suppression and lightning protection design and plan no later than 180 days after NTP.	X	
	Proposer Response: The TCS proposed by the TSP complies with RS-017 as follows: Sanef have implemented lightning and other surge protection systems in different electricity parameters based on our experience in implementing such roadside components in various parts of the world. We recognize, understand and guarantee that lightning and other surge protection will be installed on each power and data cables to protect the equipment (sensors, computer, etc.) against possible lightning strikes or surges. As part of the various elements of the overall roadside system implementation and ramp-up, we will deliver our proposed "Surge suppression and lightning protection design and plan" to the Joint Board no later than 180 days after NTP. Among other things, this plan will detail the choice and the implementation of such protections.		
RS-018	The Roadside System shall classify vehicles under all weather conditions without any degradation.	X	
	Proposer Response: The TCS proposed by the TSP complies with RS-018 as follows: To classify the vehicles without any degradation whatever the weather conditions are, the Roadside System uses two types of sensors: inductive loops and laser scanners. This sensor redundancy will ensure continuous coverage and proper vehicle classification at all times.		
RS-019	The Toll System Provider shall provide remote access to authorized users with credentials and administrative controls of the Roadside System through the BOS. The Toll System Provider shall report each time the TCS is accessed remotely for any purpose, and identify from where and by whom the remote access was generated and make this report accessible to the Joint Board at all times.	X	
	Proposer Response: The TCS proposed by the TSP complies with RS-019 as follows: Only users with the corresponding privilege are authorized through the Back Office System to access remotely to the Roadside System, windows identity foundation is used to for centralized user and security management. The FastFlow™ tolling system has been tailored to meet the specific needs of all of our clients. The FastFlow™ system records each remote access (for whatever purpose) to the Toll Collection System, including information on from where and by whom the access emanated (IP address & login ID) for possible further audit and full review by the Joint Board.		
RS-020	Toll System Provider shall take reasonable measures to ensure that all equipment in the Toll Zone is secure against damage, theft and vandalism, but is accessible by authorized personnel without special tools or equipment other than electronic or physical security keys or as may be necessary to assist in reaching heights.	X	
	Proposer Response: The TSP complies with RS-020 as follows: Sanef will develop and implement a security approach to ensure that all equipment in the Toll Zone, i.e., Toll Equipment Area and on the gantries are secure against damage, theft and vandalism. Similarly, Sanef will ensure ready access for authorized personnel to all such zones, without special tools or equipment. The primary means of access for authorized personnel will comprise key cards for doors, and keys for cabinets located in the Toll Equipment Area, and for the access trap to the ladder of each gantry, tool boxes, lockers, etc.		
RS-021	The Toll System Provider provided equipment shall comply with the latest adopted version of the National Electrical Safety Code as defined in the applicable codes and standards.	X	
	Proposer Response: The TSP complies with RS-021 as follows: Each part of the Toll Collection System where installation, operation or maintenance of electric supply and communication lines and associated equipment will comply with the latest adopted version of the National Electrical Safety Code.		
RS-022	A Traffic Transaction shall include, but not be limited to the following: date and time stamp, Toll Zone gantry location and lane number, unique transaction sequence number, vehicle classification, state or province, special plate identifier or vertical letter stack, license plate number, identifier if license plate alpha-numeric string is on a current Watch List, all toll rates for the applicable vehicle class, and the status of lane and Roadside System (e.g. open, closed, maintenance).	X	
	Proposer Response: The TCS proposed by the TSP complies with RS-022 as follows: In the Toll Collection System solution proposed by the TSP, the Traffic Transaction transmitted by the Roadside System to the Back Office System includes the following : Date and time stamp, Toll Zone gantry location and lane		

Req ID	Roadside Requirements (Section RS)	Required	Value Add
	number, unique transaction sequence number, vehicle classification, state or province, special plate identifier or vertical letter stack, license plate number with a confidence index, and the status of the lane and Roadside System (e.g. open, closed, maintenance). In the Back Office System, this Traffic Transaction is supported by the Transaction Management module. In near real-time after receiving the transaction from the roadside, the management module executes watch lists and determines toll rates. Specifically, it: • Determines, for each transaction, the correct class of the vehicle based on measures received from the Road Side Systems and/or from vehicle data looked up from external sources like the national vehicle registration file; using this information, it calculates the correct toll rate for the vehicle class. • Determines whether the transaction should be sent to manual review, in order to manually check the license plate read because the license plate number is on the Watch List or if the confidence index is lower a configurable threshold.		
RS-023	It is desired that the Toll System Provider provide in-lane OCR capabilities. If in-lane OCR capabilities are provided, the OCR confidence values for the license plate numbers including any stacked characters and state shall be provided with the message. In-lane OCR capabilities shall meet the same Performance Requirements as OCR Performance Requirements as specified in the Performance Requirements.		X
	Proposer Response: [redacted]		

Req ID	Roadside Requirements (Section RS)	Required	Value Add
	[redacted]		
RS-024	It is desired that the Toll System Provider provide Traffic Transaction, Financial Transactions and Event Transactions that are readable using commercially available and supported tools and that they shall be imported into a XML viewer or other commercial analytical tool such as Microsoft Excel.		X
	Proposer Response: [redacted]		
RS-025	The Toll System Provider shall provide a thin-client application for Traffic Transactions, Financial Transactions and Event Transactions queries and traffic activity monitoring by individuals with proper identification and password authorization.	X	
	Proposer Response: [redacted]		

[redacted]

Req ID	Roadside Requirements (Section RS)	Required	Value Add
[redacted]	[redacted]	[redacted]	

Req ID	Roadside Requirements (Section RS)	Required	Value Add
	[redacted]		
RS-026	The Toll System Provider shall provide a vehicle classification system for the TCS such that there is no single point of failure and at least two vehicle classification methodologies in the TCS that shall continue to detect, separate, and classify vehicles and capture an image of each vehicle without degradation for vehicles traveling at speeds from and including 0 MPH to 100 MPH, in stop and go conditions, and in all weather conditions.	X	
	Proposer Response: The TSP complies with RS-026 as follows: Sanef will deliver and implement the Automatic Vehicle Detection and Classification (AVDC) sub-system of Fast Flow™. The AVDC has no single point of failure and includes two complementary technologies comprising laser scanners and inductive loops that detect, separate, and classify vehicles. The AVDC also includes the scene (overview) camera, which along with the license plate (ALPR cameras), captures an		

Req ID	Roadside Requirements (Section RS)	Required	Value Add
	image of each vehicle in context on the roadway without degradation for vehicles traveling at speeds from 0 MPH to 100 MPH, in stop and go conditions, and in all weather conditions.		
RS-027	The Roadside shall receive and process BOS configuration information including Toll Rate Schedules, Transponder files, video license plate files, and other configurations as required.	X	
	Proposer Response: The TCS proposed by the TSP complies with RS-027 as follows: The roadside subsystem receives and processes configuration information from the BOS. Toll Rate Schedules and Transponder files, however, are stored at the BOS level where the Transaction Management process calculates the fare and determines the tag status at the time of the Traffic Transaction. In an AET system, there is no need to store toll rates and tag status lists at the roadside. The BOS receives transponder status files (ITAG) and License Plate information files (ICLP) from the E-ZPass interface and Customer Service Center account management system.		
RS-028	The Roadside System shall provide one of the following options: 1. Send the transactions to the BOS immediately without batching, i.e., in near-real-time, or 2. Send transactions to the BOS every 4 hours (or more frequently) which would allow batching.	X	
	Note: The Proposer shall indicate in this Technical Response Form which option will be provided in the TCS. **Proposer Response:** The TCS proposed by the TSP complies with RS-028 as follows: All transactions generated at the roadside are sent to the host level system in near real-time using reliable messaging with Microsoft Message Queuing (MSMQ) technology. These transactions are ingested into a roadside staging database for subsequent processing by the transaction management engine to determine: • Type of transaction (Tag Registered, Unregistered) and if it can be posted to an account in the Back Office. • Vehicle classification • If manual review is needed based on the business rules and OCR Confidence thresholds • Toll rate. The Transaction Management module processes transactions in the staging database in batch intervals, every [15] minutes (configurable).		
RS-029	The Roadside System shall meet the service level requirements for audit, reporting, and all other business functions. No Transactions shall be lost during periods when communications with the BOS are not available. Transactions shall be available to be manually (via laptop or tablet) downloaded from the Roadside System and BOS in case of long term loss of communications between the BOS and Roadside System.	X	
	Proposer Response: The Roadside System proposed by the TSP complies with RS-029 as follows: The roadside system has been designed so that the Toll Zone has two redundant computers that process sensor information in parallel, one of the two is the primary and considered the Toll Zone Controller responsible for sending transactions to the Host. This reduces risk of loss of data in the event of a simultaneous communications and Toll Zone Controller failure. A Data Location Table follows:		

Location	Description
AVI	Antenna Reader buffers tags reads in the event of Toll Zone Computer failures.
ICPS	Image Capture Processing System stores images locally on redundant servers.
Toll Zone Computers	Redundant Toll Zone computers capable of 30 days image & transaction storage.

Req ID	Roadside Requirements (Section RS)	Required	Value Add
	FastFlow™, the Sanef Roadside System, is a standalone solution, i.e. totally independent of the BOS. In the event of a communications failure with the BOS, the Toll Zone Controller continues to store the transactions on the local hard drive. No transactions will be lost when communications with the BOS are not available. The Toll Zone Controller includes sufficient storage to save all transactions for 30 days, based on current traffic projections. The stored transactions will be uploaded automatically once network communications are recovered, and can, at any time, be downloaded by authorized users off the Toll Zone Controller via a laptop or tablet. In case of a long-term loss of communications between the BOS and RSE, the transactions downloaded to the laptop or tablet will be uploaded to the BOS for immediate processing. *PHCS in the diagram is the Host Computer System [redacted]		
RS-030	The Toll System Provider shall take reasonable measures to protect the Roadside System from vermin and keep it rodent proof at all times.	X	
	Proposer Response: The TSP complies with RS-030 as follows: Sanef have developed fully rodent-proof Roadside Systems for recent projects. We will leverage this experience and take appropriate measures to keep vermin and rodents from getting into Roadside System infrastructure. An example is that all blowholes of the cabinets and equipment installed on the gantries will be covered metal mesh.		
RS-031	It is desired that the Roadside System accurately account for full revenue or indicated revenue when there is a toll suspension or special event that requires the toll rates to be set at less than the full toll amount to allow the Joint Board to track revenues expected during these events for the purpose of collections in the future within each transaction. The desired revenue fields in the roadside transaction message include but are not limited to full revenue (i.e. non discounted toll) and indicated revenue (i.e. premium or discounted toll subtracted from the full amount). It is desired that indicated revenue be configurable from 0% to 100% discounted from full revenue. For example, for a toll suspension, the full revenue and indicated revenue would be the same toll amount and the actual rate would be $0.00. This approach is desired as it provides clear traceability of revenues lost due to the toll suspension at the Transaction level.		X
	Proposer Response: The TCS proposed by the TSP complies with RS-031 as follows: The Back Office System is capable of accounting for full revenue or indicated revenue when there is a toll suspension or special event that requires the toll rates to be set at less than the full toll amount. When the transaction is posted in the BOS, it includes both full revenue (i.e. non discounted toll) and indicated revenue (i.e. premium or discounted toll subtracted from the full amount). Furthermore, the tools will enable configuration from anywhere in the range of a 0% to 100% discount of the full revenue as per the example. We recognize and will respect the need to provide clear traceability of the difference between full revenue and lost revenue due to the toll suspension at the Transaction level.		
RS-032	The Toll System Provider shall provide time synchronization for the TCS. All elements shall use this time for all associated time stamps.	X	
	Proposer Response: The TSP complies with RS-032 as follows: The system architecture of the Toll Collection System proposed by the TSP for the LSIORB		

Req ID	Roadside Requirements (Section RS)	Required	Value Add
	Project includes a time server for the synchronization for the same time reference of all computer equipment (Roadside System, BOS, CSC and TOC) and will enable a time stamp for all events and files. This time server will in turn be synchronized by a time server used by the NIST Internet Time Service (ITS).		
RS-033	The current E-ZPass Transponder list is approximately 44,000,000 entries for approximately 26,000,000 Transponders. The list is expected to be 95,000,000 entries in the next 5 years. The TCS shall process the current size Transponder list and current anticipated growth and shall process E-ZPass transactions in accordance with the E-ZPass policies and procedures.	X	
	Proposer Response: The TCS proposed by the TSP complies with RS-033 as follows: As part of the Toll Collection System proposed by the TSP for the LSIORB Project, the Back Office System will process the different Transponder lists and authorized non-revenue vehicles as well as to process E-ZPass transactions in accordance with the E-ZPass policies and procedures. The Back Office System will be sized accounting the current lists size of 44 Million entries for 26 Million Transponders and their forecast growth within the next five years of 95 Million entries.		
RS-034	The Roadside System shall process E-ZPass Group files or lists received from the BOS including the Transponder list (ITAG file), customer license plate list (ICLP file), invalid Transponder customer list (IITC file), and authorized non-revenue vehicles.	X	
	Proposer Response: [redacted]		

Req ID	Roadside Requirements (Section RS)	Required	Value Add
RS-035	The Roadside System shall be remotely accessible and user configurable to view operational status and data for reconciliation purposes.	X	
	Proposer Response: The Roadside System proposed by the TSP complies with RS-035 as follows: The Roadside System, is remotely accessible and user configurable to view operational status and data for reconciliation purposes from the Toll Point Supervision (TPS) application of the Back Office System. This application is used for real-time monitoring of toll revenue transactions generated at all gantries in operation. This application is also used to monitor all status information available from various tolling system elements. The TPS is designed to satisfy typical toll supervisor interaction scenarios such as monitoring the health of the system and peripherals. The application constantly refreshes keeping information displayed current.		
RS-036	The Roadside System shall be installed and configured for multi-lane free flow tolling operations. The Roadside System requirements apply, and the Roadside System shall accurately process all Traffic Transactions in accordance with the Performance Requirements, regardless of the vehicle position while traveling within the Toll Zone.	X	
	Proposer Response: [redacted]		

Req ID	Roadside Requirements (Section RS)	Required	Value Add
[redacted]	[redacted]		
RS-037	The Roadside System shall accurately capture and process 2,300 vehicles per hour per equipment lane at each Toll Zone for all vehicle types.	X	
	Proposer Response: The Roadside System proposed by the TSP complies with RS-037 as follows: FastToll™ was designed to capture and process more than 2,500 vehicles per hour per equipment lane at each Toll Zone for all vehicle types. FastToll™ is currently operational on the Port Mann bridge in Vancouver and M50 in Dublin with continuous capture and processing, and both installations are capable of surpassing this requirement.		
RS-038	The Roadside System shall accurately toll vehicles traveling at any speed up to 100 miles per hour.	X	
	Proposer Response: The Roadside System proposed by the TSP complies RS-038 as follows: FastToll™ was designed to detect, identify and classify vehicles traveling at any speed up to 120 miles per hour. The compliance to this requirement is usually demonstrated during the Factory Acceptance Tests with controlled traffic conditions. Current deployment of FastToll™ on the Port Mann bridge in Vancouver and M50 in Dublin consistently detect, identify and classify vehicles traveling at speeds up to 120 mph.		
RS-039	The Roadside System shall operate so as to meet all Performance Requirements in an ambient (external to cabinet) temperature range of -20˚F to 120˚F in full sun or shade with a relative humidity ambient from 5 to 100 % (external to cabinet).	X	
	Proposer Response: The TCS proposed by the TSP complies with RS-039 as follows: The Roadside System has been designed and will be implemented in order to meet all the Performances Requirements corresponding to operating in an ambient (external to cabinet) temperature range of -20˚F to 120˚F in full sun or shade with a relative humidity ambient from 5 to 100 % (external to cabinet).		

Req ID	Roadside Requirements (Section RS)	Required	Value Add
RS-040	The Toll System Provider shall provide, install and configure a generator that allows the Roadside System to operate without refueling for 72 consecutive hours. The Toll System Provider shall provide a single generator per each Toll Gantry. The Toll System Provider shall provide all labor, materials and equipment and perform all civil work required to prepare a concrete pad for the generator.	X	
	Note: A diagrammatic view of the toll equipment site including the location of the generator is provided in Attachment C-2. **Proposer Response:** The TSP will comply with RS-041 as follows: Sanef will provide, install, test and configure a backup power generator for each Toll gantry: We will provide and install each generator close to the gantries in the Toll Equipment Area on a concrete slab with a pollution retention tray. The generator will be fitted with an automatic starting module to ensure that the generator automatically provides electricity in case of a cut in commercial electrical power. If a generator does not start automatically, the UPS will allow for the Roadside System to operate for sufficient time to initiate manual starting of the power generator by maintenance staff. The fuel tank of each power generator will be sized in order to operate continuously for at least 72 hours without interruption in case of commercial power loss.		
RS-041	The Toll System Provider shall provide a Changeable Message Panel LED 35 x 7 array Daktronics 1020 DDMS or approved equivalent. The Toll System Provider shall provide a local serial connection and wireless option. The Toll System Provider shall provide, procure, install, test and configure the changeable message panels. The Toll System Provider shall connect the TCS with the sign to update rates via a wireless communication. The changeable message panels shall provide rate information between $0 - $99.99 dollars and shall also be able to display other text information such as No Tolls.	X	
	Note: The toll rate sign structures and foundations will be provided by others. A diagrammatic view of the toll rate signs is provided in Attachment C-4. **Proposer Response:** The TSP complies with RS-041 as follows: Sanef will provide, install, test and configure Changeable Message Panel LED 35 x 7 array Daktronics 1020 DDMS (or approved equivalent) able to display toll rate information between $0 - $99.99 dollars and other text information such as No Tolls for each toll zone. The Changeable Message Panel will be connected to the Toll Collection System via a wireless communication link to update simultaneously the toll rates in the Back Office System and on the Changeable Message Sign.		
RS-042	It is desired that all electrical equipment and components be certified by Underwriters Laboratory.		X
	Proposer Response: The TSP complies with RS-041 as follows: All electrical equipment and components used for the LSIORB Project by the TSP will be certified regarding the safety either by Underwriters Laboratory or by any other safety body.		
RS-043	The Roadside system shall be sized to operate continuously for 72 continuous hours without interruption in case of commercial power loss.	X	
	Note; The Proposer shall describe in this Technical Response Form how the system will operate continuously for 72 hours without loss of any data. **Proposer Response**: The TCS proposed by the TSP complies with RS-043 as follows: Each Toll Zone shall be provided with its own backup power generator, installed close to the gantries in the Toll Equipment Area on a concrete slab with a polluting retention tray. The generator will be fitted with an automatic starting module to ensure that the power is automatically taken over from the generator in case of mains loss. If it does not start automatically, the UPS will allow for the Roadside System operation before manual starting of the power generator by maintenance staff. The fuel tank of each power generator will be sized in order to operate continuously for at least 72 hours without interruption in case of commercial power loss. The system will function as it does when it gets power from the normal commercial utility, so no data can be lost.		
RS-044	It is desired that wrong way detection functionality including reporting and alarms associated with a vehicle passing through a Toll Zone in the wrong direction be provided in the TCS.		X
	Proposer Response: The TSP complies with RS-044 as follows: It should be noted that wrong way detection functionality including reporting and alarms is not part of the current functionalities of Fast Flow™. According to our internal roadmap to enhance the FastFlow™ system, this detection functionality should be available by the time the system goes live in 2017.		

Back office System Requirements

Req ID	Back office (Section BO)	Required	Value Add
BO-001	The Toll System Provider shall provide a BOS that consists of a transaction system and an account management system to manage toll accounts and process Traffic Transactions, Financial Transactions and Event Transactions.	X	
	Proposer Response: [redacted]		

Req ID	Back office (Section BO)	Required	Value Add
	[redacted]		

Req ID	Back office (Section BO)	Required	Value Add
	[redacted]		
	[redacted]		
	[redacted]		

Req ID	Back office (Section BO)	Required	Value Add
	[redacted]		

Req ID	Back office (Section BO)	Required	Value Add
BO-002	The Toll System Provider shall provide a complete, functioning, AET System that includes a Roadside System, BOS account management system, image review system and Customer Service Center. The BOS shall be configured and sized to support the functionality of the AET System, and shall also support account and Transaction growth at a rates of 15% per annum without any degradation in performance. The TCS shall collect revenue, accept Traffic Transactions and roadside data from the Roadside System, manage customer accounts, process images for vehicle identification, interface with numerous external systems, offer retail options for transponder sales and distribution, and provide access for toll patrons to utilize other E-ZPass toll facilities. The TCS shall be expandable to allow toll patrons to utilize other nationwide facilities in the future and perform all other functions as necessary to comply with the other Technical Requirements and other Contract Documents.	X	
	Proposer Response: [redacted]		

Req ID	Back office (Section BO)	Required	Value Add
	[redacted]		

Req ID	Back office (Section BO)	Required	Value Add
	[redacted]		
BO-003	The BO TCS shall have a transaction database, video image storage array and an interface with the Roadside System to receive Traffic Transactions. The BO TCS shall have a CSC account management system, an IVR telephone system, a web interface, a local area network provider, a video image review process, a Disaster Recovery System Plan, an auditing and reconciliation process, interfaces with the CSC, Walk Up Centers, web services, an archiving system, and extensive reporting capabilities.	X	
	Proposer Response: [redacted]		

Req ID	Back office (Section BO)	Required	Value Add
	[redacted]		
	[redacted]		
	[redacted]		
	[redacted]		
	[redacted]		
	[redacted]		
	[redacted]		
	[redacted]		
	[redacted]		

Req ID	Back office (Section BO)	Required	Value Add
	[redacted]		
BO-004	The Toll System Provider shall provide 1) account management and maintenance functions; 2) the Customer Website; 3) Transaction processing for Traffic Transactions, Financial Transaction and Event Transactions; 4) collections transaction processing and interface(s) for both current and past-due accounts; 5) DMV and rental car look-ups and interfaces; 6) functions necessary to allow authorized users to input Toll Rate Schedules into the System; 7) image review processing; 8) Transponder fulfillment functions; 9) IVR phone system for customer service use; 10) Walkup Centers and retail operations support services; 11) distribution of Transponders, reloading and replenishment services and toll and Violation payments collections and processing; 12) payment and credit card processing of Customer Statements; 13) transaction auditing and reconciliation; 14) customer contact services through phone, email, and SMS; 15) automatic generation of Customer Statements and Correspondence production and tracking; 16) operations and financial reporting; 17) remote location account services (Mobile Van); 18) physical and logical security; 19) Hardware; and 20) disaster recovery systems.	X	
	Note: The functionality to support remote location account services shall be included in the Proposer's response but the design, acquisition and use of the mobile van		

Req ID	Back office (Section BO)	Required	Value Add
	is a Pass-Through Cost Item and shall not be included in the Proposer's response. **Proposer Response:** The BOS complies with requirement BO-004 in the following manner: 1) *Account management and maintenance functions*: **Sanef ITS** Back Office **TollCRM**, provides a comprehensive set of account management functions including demographics, vehicles, transponders, payment methods, financial and non-financial history, notes and search capabilities; 2) *Customer Website*: A complete customer web site is provided including static content pages, live traffic and event information affecting facility customers, and interactive account management pages; 3) *Transaction processing for Traffic Transactions, Financial Transaction and Event Transactions*: **Sanef ITS** Back Office Transaction Management module manages the entire transaction flow from the roadside equipment through account posting and subsequent financial transactions; 4) *Collections transaction processing and interface(s) for both current and past-due accounts*: **Sanef ITS** Back Office contains a comprehensive set of collection actions (e.g., withholding future vehicle registration renewal), noticing capabilities (statements, invoices, violation notices, etc.)and interfaces to outside enforcement agencies and parties in preparing and delivering evidence packages; 5) *DMV and rental car look-ups and interfaces*: A standard interface to external organizations such as DMV and private companies for the receipt and transmittal of vehicle owner/operator information is provided in **FastToll ERP™**; 6) *Functions necessary to allow authorized users to input Toll Rate Schedules into the System*: The Toll Admin interface allows users to manage toll rate information and communicates the new toll schedule to the roadside or host levels; 7) Image review processing: **Sanef ITS** Back Office **TollCRM** contains the Image Review module which is used by image review clerks to review each image in the Review Pending queue. This queue contains transactions and associated images that could not be processed automatically by the toll transaction processing and require manual review; 8) *Transponder fulfillment functions*: **Sanef ITS** Back Office **™ TollCRM** contains inventory, purchasing, receiving, testing and programming, order fulfillment, returns, distribution, tag replacement relating to transponder fulfillment and management; 9*) IVR phone system for customer service use:* The **Sanef ITS** Back Office includes an Interactive Voice Response (IVR) system interface as part of **FastToll ERP™**. It provides an automated method to perform typical account actions, by guiding callers to the correct Customer Service queue based on the keypad or voice recognition selections they make. Common tasks such as checking account balances, or authorizing a payment, can be made using IVR without speaking to a CSR; 10) *Walkup Centers and retail operations support services:* The **Sanef** solution provides for a network of walk up centers, points of sale or retail shops equipped with payment terminals. All members of this network are connected to the Back Office system to provide various remote services to customers; 11) *Distribution of Transponders, reloading and replenishment services and toll and Violation payments collections and processing:* **Sanef ITS** Back Office **TollCRM** contains inventory, purchasing, receiving, testing and programming, order fulfillment, returns, distribution, tag replacement relating to transponder fulfillment and management. Payment processing exists at all customer channels and accepts payments for violations. 12*) Payment and credit card processing of Customer Statements*. One supporting module within **Sanef ITS** Back Office is CSC Pay. The CSC Pay interface is part of the Payment Gateway Interface (PGI). This interface handles all card payments, ACH, refunds, independent refunds, voids, reversal, and pre-authorized transactions. CSC Pay provides an interface to the Back Office applications that expose generic request and response objects to integrate with third party payment processing services for debit/credit card transactions. Tokenization is used for security and encryption purposes. Financial data is not stored on the database but by the PGI provider. 13) *Transaction auditing and reconciliation*: The Account Services module holds the business rules that enable FastToll ERP to perform a wide array of auditing and reconciliation activities. For example, the revenue received in the system is reconciled with the approved bank in an expeditious manner every business day. To support this reconciliation on a daily basis, the Account Service modules reconciles settlement data from various payment channels with the amounts recorded in the system. The cash payments received in the system is reconciled using customer service representative, Checkout and Checkout approval processes. The electronic payments processed through payment processing gateways are reconciled using the settlement files provided by the payment processor. All lockbox and check payments recorded in the system are reconciled using the bank settlement files. This type of reconciliation is provided in the roadside transaction interface, other financial processes and external interfaces.		

Req ID	Back office (Section BO)	Required	Value Add
	14) *Customer contact services through phone, email, and SMS*: Sanef ITS supports SMS, the text messaging service component of phone, web, or mobile communication systems, using standardized communications to send messages to customers **Sanef ITS** Back Office uses this approach to communicate low balance warnings, statement amounts and messages from the owner. Depending upon customer options, traditional phone and email processing are also available. 15) *Automatic generation of Customer Statements and Correspondence production and tracking*: The FastToll ERP™ solution provides statements and invoices for customers. It provides a set of features and benefits to: • Deliver simple, detailed statements and invoices in multiple formats; • Enable the creation, editing and versioning of templates; • Provide advanced messaging, which allows general and customer specific messages to be included on statements and invoices; • Provide reduction in operational costs by employing business logic to control and limit mail delivery and provides a paperless delivery system; • Offer consolidated billing for customers who share the same address. 16) *Operations and financial reporting*: The following are some examples of the standard reports available in the system: • Account Receivable • Disputes and Complaints • Revenue • Accuracy • Down-Time • Service Factor • Administration/Setup • Exempt • Statements and Invoicing • Business Fleet • Expenditure • System • Cash Management • FSS • System Up-Time • Channel • Image Review • Tag Fulfillment • Collections and RTI • Inquiries and Disputes • TollCRM • Consolidated Billing • Interoperability • Tolling Operator Performance • Customer • Promotions • Traffic • Customer Satisfaction • Response and Repair 17) *Remote location account services (including Mobile Van).* FastToll ERP fully supports the addition of future walk-in and retail locations. 18) *Physical and logical security*: At Sanef ITS, security is a top priority. Key management is used for securing user access, Network Segmentation, Firewalls, Routers and switches, application layer security and several techniques are all employed by Sanef ITS. 19) *Hardware:* The Sanef solution contains all the hardware necessary to support a roadside system that is scalable and available. At the roadside, antennas are used to provide complete coverage of the roadside, and the cameras overlap, so that if one fails another should be able to capture either a front or rear image of a vehicle going through the lane. Lane controllers function in a failover capacity, and the network is a ring configuration with LAN segments that have redundant switches and routes. 20) *Disaster recovery systems*: The **Sanef ITS** Back Office IT Infrastructure is built on leading-edge technologies that provide high availability and scalability. For example, we use Hyper-V virtualization technology from Microsoft and i-SCSI SANs to provide server redundancy at each level: web front end, application, and database. Customer can chose to have on-premises servers or private cloud-based hosted solution. In order to support business continuity, the **Sanef ITS** BOS includes a secondary site, also called Disaster Recovery (DR) site. The DR is designed to take over from the primary site on a temporary basis if the primary site fails. The DR is capable of supporting all of the services running at the primary site. The secondary site is hosted at a physical location in a second data center across the country. Data is replicated from the primary site to the DR site using asynchronous replication to maximize performance.		
BO-005	The Toll System Provider shall provide functionality for mobile operations (off site, not only Walk-Up Centers and retail operations, but mobile van services) for account setup, account management, retail distribution of Transponders and for retail operations. However, the System shall support the use of a mobile van in order to meet this requirement. The mobile van shall be a Pass-Through Cost Item if required by the Joint Board.	X	
	Note: The mobile van and all associated costs to outfit the mobile van shall not be included in this Technical Response Form, but Proposer shall indicate in this Technical Response Form how the proposed System shall support the use of a mobile van in order to meet this requirement.		

Req ID	Back office (Section BO)	Required	Value Add
	Proposer Response: The TCS complies with requirement BO-005 in the following manner: Sanef ITS will, if the joint board elects, provide a mobile satellite CSC. To meet this requirement Sanef ITS will outfit a mobile platform such as a van or small mobile home with a vehicle installed GPRS (4G cellular data network) data device. This GPRS device will then be connected to a Cisco firewall that will establish a secure VPN connection to the CSC back office. This creates a secure wired and/or wireless network that can be used by computers installed in the vehicle to act as nodes on the CSC network. The vehicle will also be equipped with document scanner, bar code reader, laser printer, and test antenna. Transponders will be assigned to its mobile inventory for management and distribution. The vehicle will also have a permanently installed safe for cash deposits. All of the functions of a CSC will be available from the mobile satellite CSC. These will be used to interact with customers, permitting the opening, management and closing of customer accounts, distribution of new issue and replacement transponders, and other CSR functions. To ensure that there are proper cash handling controls the CSR checkout functions can be performed in the mobile CSC and the deposits verified at the main CSC when the vehicle returns from its deployment. At such time, the safe would be open by someone in the finance department and a double recount of the cash collected performed.		
BO-006	The Toll System Provider shall provide typical account services including making adjustments to accounts, changing Toll Rate Schedules, processing refunds, handling Violations, closing accounts, denoting customer contact and documenting those contacts, and offering account statements through print, email, and the Customer Service Website.	X	
	Proposer Response: The BOS complies with requirement BO-006 in the following manner: FastToll ERP provides all of the elements described in this requirement, TollCRM provides all of the customer contact related issues for CSR's to work with accounts and TollAdmin provides the configuration management of many others. The account services mentioned in the requirement are provided in the following areas within the **Sanef** Back Office: • **Account Management** (including account closure): For CSRs to create, manage, and close registered and unregistered customer accounts (demographics, vehicles, transponders, payment methods, financial and non-financial history, notes and search); • **Toll Adjustments:** For handling home and away customer disputes and making any needed adjustments to accounts; • **Customer Contact** (including documentation of all contacts**):** The CSRs have the ability to record customer calls via the phone system. The system also logs to the account the date and time of the contact, as well as the duration, any private notes in the system (such as the reason given by a customer in requesting a toll fee waiver), and enters public notes that the customer can see such as the disposition of the waver. Notes can also be created and stored in the system for future use by CSR's. • **Violation Enforcement:** This process handles all the transactions that are violations as per the business rules. This module has an internal escalation process that carries through the notification, collections and courts until the transactions final disposition as either a revenue transaction or write-off. • **Financial Processing** (including refunds)**:** Used by finance clerks to close accounts, reverse payments (same day), process NSF (insufficient funds), Chargebacks, refunds, write-offs; collections agency interface; • **Statements and Invoices:** Customers can, at any time, log into their account from the computer or mobile device, view and print their statements or invoices. They can also in, managing their account, select to have this emailed or regular mailed to them as well. In addition, they can download statements as pdf, csv or excel files, allowing the storage of pdf statements electronically, as well as the ability for commercial accounts to import transactions into their Fleet Management Systems (FMS) to track costs. • **Customer Service Website:** The customer website is a secure site that requires username and passwords for authentication and access. The site permits customers to perform a variety of functions from creating their account, managing their contact, billing, payment and vehicle information and other functions that have become the standard common practice in the tolling industry. TollAdmin is the module from which authorized users can manage configurable parameters, schedules and workflow processes. The main screen is the dashboard that permits the user to have an overview of the system, connections, status, transactions and events. Form here, the user can access the toll rate manager screen, which is used to create toll rate schedules. Toll rate schedules are created and stored for scheduled future deployment. Before they are saved, sanity checks ensuring that the new table is correct based on predefined thresholds and that the date for implementation is valid are performed. Once stored, an event is created alerting the facility manager of the new toll rate and when it will become valid. Then the system will automatically activate the toll rate at the scheduled time.		

Req ID	Back office (Section BO)	Required	Value Add
BO-007	The TCS shall have the ability to search, look-up and find customer accounts using numerous fields including customer name, account number, Transponder number, and address.	X	
	Proposer Response: [redacted]		
BO-008	The TCS shall be able to replenish an account through the use of a credit card, at retail distribution outlets and through the use of cash or credit card at Walk-Up Centers. The TCS shall have a methodology to identify lost or stolen Transponders when a Traffic Transaction occurs using a lost or stolen Transponder.	X	

Proposer Response: The TCS complies with requirement BO-008 in the following manner: The TCS can process Credit, Debit cards as well as checks, ACH, and cash transactions. The table below shows each channel for accepting account payments and the types of payment accepted at each:

	Payment Type			
Channel	Cash	Credit/Debit	Check	ACH
Walk-UP/Remote/Mobile	X	X	X	X
Retail	X (1)	X (1)	X (1)	
Kiosk		X		
Web		X	X	X
Mobile		X	X	X
IVR		X	X	
Phone		X	X	
Mail in	X (2)	X	X	X

(1) Retailers may accept this payment method for the sale of tag kits or the purchase of prepaid credit cards.
(2) The policy is that Cash is not an acceptable mail in payment, but the lockbox does support receiving cash payments.

When a transaction occurs with a lost or stolen transponder the transaction is flagged as a violation by the Host and is processed according to the business rules for this type of transaction. The notification process is typically different in that the registered vehicle owner may not be responsible for the charges if they have previous to the transaction informed the CSC that the TAG was in fact lost stolen. The table below provides a sample of the business rules, which are completely configurable, and which we plan to finalize in discussions with the Joint Board:

Scenario	Business Rule
CSC informed before transaction with different vehicle	The customer is not liable, will issue invoice based on vehicle license plate.
CSC informed before transaction with same vehicle	The customer vehicle was stolen and is not liable, copy of police report required. Transaction

Req ID	Back office (Section BO)	Required	Value Add
	can be written off CSC not informed before transaction with different vehicle — The customer may be liable, CSR may issue invoice based on vehicle license plate or post to tag account. CSC not informed before transaction with same vehicle — The customer vehicle was stolen and is not liable, copy of police report required. Transaction can be written off		
BO-009	It is desired that the Toll System Provider provide a smart phone application for customer account management and account replenishment services.		X
	Proposer Response: The TCS complies with requirement BO-009 in the following manner: The Sanef Back Office includes a smart phone application that can accomplish the same set of features as available on the Customer Web Site. Both the website and smart phone application take advantage of the Web interface, which is a set of web services that support external access to the system. The business logic and processing flow on the web site is available in the smart phone application.		
BO-010	The Toll System Provider shall provide a TCS that assigns static toll rates to Transactions from the roadway based upon the latest Toll Rate Schedule or discounts established by the Joint Board.	X	
	Proposer Response: The TCS complies with requirement BO-010 in the following manner: Transactions from the roadside are assigned static rates based on the current toll rate for the vehicle class at the time of the transaction. The version of the toll rate schedule used for each transaction will be stored with the transaction. We expect the Joint Board to provide the toll rates (including both permanent/default toll rates and any temporary/event toll rates) and any discounts awarded. The TCS will apply the discounts at the account level in the BO. These discounts can be for different types of plans such as commuter, frequency of use, time of day, and others. Programs can also be used to apply discounts in order to provide an incentive to create an account and install a transponder that is available for a limited time or for limited use.		
BO-011	The Toll Rate Schedules shall be transmitted electronically and updated as approved by the Joint Board. Toll Rate Schedules shall be utilized to establish the numerous toll rates to be assigned based on type of Traffic Transaction (ETC or pay by plate (pre-or post-registered)), vehicle classification, and discounts or promotions.	X	
	Proposer Response: The TCS complies with requirement BO-011 in the following manner: Joint Board-approved toll rates are managed by TollAdmin module within FastToll ERP. TollAdmin transfers toll rate schedules electronically to the host level, which assigns the correct toll rate for each transaction it receives from the roadside. The toll rate manager within TollAdmin accommodates a variety of business rule combinations used to create the toll rate tables identified in this requirement. Toll rates can be implemented using any combination of vehicle class, time of day, date, payment types (video or ETC), account types (pre-paid or post-paid) and agency (home or away). All the discounts and promotions are managed at the account level and permit residency discounts, usage discounts, user discounts, and promotions (a form of discount that expires after a period of time or usage).		
BO-012	It is desired that the TCS provide functionality to support variable rates provided by an external system.		X

Req ID	Back office (Section BO)	Required	Value Add
	Note: The availability of this functionality will not be a condition to commencement of Revenue Service. **Proposer Response:** The TCS complies with requirement BO-012 in the following manner: The FastToll Host can accept the input from external sources for toll rates and apply them to transactions received from the roadside. Sanef ITS will provide to the external toll rate provider an ICD so that they can transmit the toll rate information in a format that is acceptable. The business rules for the difference between display times of toll rates and for the application time of those rates (so that drivers who see a given toll rate displayed are never charged more than the displayed rate) will be finalized with the Joint Board. FastToll Host has sanity checks that are used to ensure that toll rates are within acceptable parameters for each vehicle class and account types. These parameters will have to be configured to be with the acceptable boundaries of data received from the external rate tables. Examples are: for dynamic toll rates, minimum and maximum toll values permitted per class; for time of day toll rates, the hours permitted for toll rate changes and other checks intended to ensure that the tolls charged are correct.		
BO-013	The TCS shall store and link electronic copies of any inbound or outbound Correspondence to an account, including all types of mail, email, regular mail, fax, etc. and the Correspondence shall be visually available to the CSRs. Hard copy Correspondence shall be scanned and converted to a viewable electronic file for storage in the TCS. The TCS shall provide sufficient archiving capabilities for Correspondence associated with each customer account.	X	
	Proposer Response: [redacted] of time requested by the Joint Board. After this storage period the permanent media can either be handed over to the Joint Board or destroyed as directed.		
BO-014	The TCS shall generate automated notices, letters and communications by regular mail, text messages, incoming BO-fax and e-mail. The Toll System Provider shall	X	

Req ID	Back office (Section BO)	Required	Value Add
	provide automated notices, one-time notices, bulk mail notices or individual notices for any Correspondence related to Toll System Provider and TCS operations. This function shall be configurable and shall allow management to prevent any type of notice from being processed automatically. The TCS shall provide functionality to process and send bulk mail Correspondence resulting from notices and general Correspondence. TSP shall provide such notices as are required by the approved Business Rules.		
	Proposer Response: The BOS complies with requirement BO-014 in the following manner: TollCRM permits the generation of both automatic and on-demand notices for all documents managed in the system. These can be configured as one-time notices or recurring notices. These can also be generated as individual or bulk type correspondences. FastToll ERP permits any feasible distribution channel, including the notices being printed internally, sent to print house, emailed, SMS/text, and faxed. The message text is configurable using XSLT editors and other parameters can me managed though TollAdmin. Before bulk notices are generated and sent, a second authorization is required. The correspondence delivery and standard configuration will be finalized based on the Joint Board approved business rules.		
BO-015	The Toll System Provider shall provide a BOS account management system that provides customer service channels by phone, web and an Interactive Voice Response system.	X	
	Proposer Response: [redacted]		
BO-016	The Toll System Provider shall provide a BOS that offers a simple, intuitive process for establishing accounts and managing and modifying those accounts through the Customer Website, through the help of a CSR by phone, through retail distribution outlets, through mail received at the CSC, or through the help of a CSR at a Walk-Up Center. The TCS shall provide an efficient and user friendly platform for CSRs to optimize their time in establishing and helping customers to manage their accounts.	X	
	Proposer Response: [redacted]		

Req ID	Back office (Section BO)	Required	Value Add
	[redacted]		
[redacted]	[redacted]	[redacted]	[redacted]

Req ID	Back office (Section BO)	Required	Value Add
BO-017	The Toll System Provider shall provide a BOS that can provide a resident, commuter and/or local plan. This functionality shall allow eligible customers, as determined by the Joint Board, to have a percentage or fixed dollar amount reduction in their tolls each month after a configurable number of trips on a Bridge. This functionality shall have the ability to reduce toll rates from 0% to 100% tolls for eligible account holders. The functionality shall also include the capability to charge a fixed fee per month, quarter or year for unlimited use of each Bridge and aggregated to all Bridges.	X	
	Note: This functionality may or may not be used but would allow eligible customers, as determined by the Joint Board, to have a percentage or fixed dollar amount reduction in their tolls each month after a configurable number of passages. The Proposer shall describe in this Technical Response Form existing functionality in its TCS that provides for resident/commuter plans. **Proposer Response:** [redacted]		
BO-018	The TCS shall provide the ability to transfer an account from one account owner to another account owner using an affidavit process.	X	
	Note: The Proposer shall describe in this Technical Response Form its transferrable account capabilities, its affidavit system function and operations processes. **Proposer Response:** [redacted]		

Req ID	Back office (Section BO)	Required	Value Add
	[redacted]		
BO-019	It is desired that the transfer of account ownership be accomplished through an automated process to the extent possible.		X
	Proposer Response: The TCS complies with requirement BO-019 in the following manner: The BO provides CSR's the ability to quickly complete the transfer of vehicles, transponders, and other account attributes from one account to another. The CSR selects the transactions and attributes to transfer between the accounts then executes the transfer. Notifications are automatically sent to the email account on file for the recipient account informing them of the successful transfer of account elements such as tags, transactions and balances.		
BO-020	The TCS shall provide functionality for rental car Traffic Transactions accepted within the E-ZPass system.	X	
	Proposer Response: The TCS complies with requirement BO-020 in the following manner: Rental car transactions are processed within the E-ZPass system using standard Inter-Customer Service Center interface. Third-party rental car service providers send active rental car details (Tag and Plate) for major car rental agencies in North America to E-ZPass agencies. Rental car company vehicles (plate and associated transponders) are contained within the E-ZPass interface Tag Status File (ITAG) and Customer License Plate File (ICLP), which are exchanged between all agencies on a daily basis. The transaction management process identifies rental vehicles as "Away on Home" transactions and sends these transactions for payment in the E-ZPass interface transaction file (ICTX) for subsequent reconciliation (ICRX file) with the Away CSC (account owner). Rental car transactions can be tag-based when found in the ITAG file with valid status (active or low balance) or iToll transactions if information is retrieved from the Customer License Plate File (ICLP). CSCs that issue transponders to the rental car companies will subsequently reconcile with the third-party rental car service providers such as the Highway Toll Administration, LLC (HTA) and American Traffic Solutions (ATSOL). Note that each rental car agency has different policies regarding how they pass tolls onto their customers. It is possible to support short-term accounts where a customer driving a rental car can create a temporary account or add the license plate number of the rental vehicle on their existing account and toll transactions will be charged directly to their normal account. It is also possible for E-ZPass customers using a rental vehicle to use their transponders in their rental vehicles, which will subsequently post tolls to their account after travel.		
BO-021	It is desired that the TCS provide functionality to process and collect revenue for rental or leased cars outside of those collected in the E-ZPass system.		X
	Proposer Response: The TCS complies with requirement BO-021 in the following manner: Rental car transactions are processed outside the E-ZPass system using direct interfaces to third-party rental agency service providers. Most rental agencies now offer their customers the option of including tolls with the credit card used to rent the vehicle. These customers can use LSIORB facilities without worrying about becoming a violator. The Sanef back office is currently integrated with Highway Toll Administration, LLC (HTA) services. HTA provides daily plate information files for rental car vehicles from AVIS Rent A Car, Budget Rent A Car, Enterprise Rental Car, National Car Rental and others. The HTA interface provides the following functionality: • An account for each rental agency is maintained in the back office as a fleet account; • HTA sends a plate information file to the back office on a daily basis (contains plate and classification information); • The Sanef back office transaction management process associates rental car passages to the rental agency account and forwards these transactions to HTA		

Req ID	Back office (Section BO)	Required	Value Add
	for subsequent payment and reconciliation. • Rental agencies charge tolls to the credit card used to rent the vehicle.		
BO-022	It is desired that the TCS provide functionality to allow a customer to open a temporary unregistered license plate account that is configured for up to XX days where the days are from 0 to 99 days.		X
	Proposer Response: The TCS complies with requirement BO-022 in the following manner: The **Sanef** Back Office provides within TollCRM and the Customer Website the ability for users to establish unregistered (anonymous) accounts with a one-time payment. As long as the account is sufficiently funded, no DMV lookup will be performed for the license plates of vehicles registered on this account, and users need not provide names or other contact details. The TollAdmin module maintains a configurable number of days (up to 99 or even more) for this type of account before it expires and the funds forfeited or returned (business rules which will be finalized with the Joint Board).		
BO-023	The TCS shall provide a configurable minimum balance to open an account. The minimum balance shall be configurable by account type (e.g. ETC, registered license plate, commercial, government) and once configured shall allow CSR supervisors to override the minimum balance requirement for individual accounts where necessary. The required minimum balances shall be subject to Joint Board approval.	X	
	Proposer Response: The TCS complies with requirement BO-023 in the following manner: FastToll ERP fully supports configurable minimum account balances (maintained in TollAdmin) based on account types and even vehicle types. The initial minimum balance required to open an account should be sufficient to permit an account be open and used by the customer for some time until an account replenishment is required. FastToll ERP can permit supervisors to adjust minimum account balances to individual accounts. The TCS will be configured so that the initial amount represents the values approved by the Joint Board for each account type. These values are configurable and authorized users, such as CRS supervisors, are able to change these values within the system, although in our experience it is best to set this business rule at the start of tolling and not to change it in order not to confuse the public.		
BO-024	The TCS shall allow accounts to be converted from one account type to another account type. The TCS shall update the Toll Rate Schedules for the new toll account when the conversion occurs in accordance with the Business Rules.	X	
	Note: The Proposer shall describe which account types can be converted in its Technical Response Form. **Proposer Response:** The TCS complies with requirement BO-024 in the following manner: Within FastToll ERP, all account types (anonymous, unregistered, private, commercial, prepaid, postpaid, violation), other than non-revenue (i.e., accounts not charged tolls at all on LSIORB facilities), can be converted to any other account type other than non-revenue. When an account type is converted, existing payment history and balances are transferred to the new account type. After the conversion is completed, all tolls charged to that account will reflect the toll rates for the new account type.		
BO-025	The TCS shall provide a configurable low balance threshold for accounts by account type. The TCS shall allow the low balance threshold to be overridden with management approval on a case by case basis. The required minimum low balance threshold shall be subject to Joint Board approval.	X	
	Proposer Response: [redacted]		

Req ID	Back office (Section BO)	Required	Value Add
BO-026	It is desired that the Toll System Provider provide other services to promote customer self-service applications such as chat, SMS and other emerging payment options.		X
	Proposer Response: [redacted]		
BO-027	The Toll System Provider shall ensure consistency of service, regardless of whether these services are provided in-house or by one or several external service providers, by developing policies and procedures and ensuring compliance with these policies and procedures.	X	
	Proposer Response: The TCS complies with requirement BO-027 in the following manner: As an operator on many toll facilities, Sanef's experience has always included the responsibility for ensuring that all internal functions, as well as outsourced services, meet the highest levels of customer service. To perform so well, Sanef ITS takes numerous steps to measure our customer service performance. First, our workflow processes are designed (based on our ISO 9001 accreditation) so that they can be delivered consistently with the highest level of service to the customer. Our training for all roles is extensive and testing is used to ensure that the material is comprehended by the student. We use Key Performance Indicator reporting to measure the performance of all services (internal & external) provided under the operations contract. This is done in order to ensure that the service level requirements of the contract are being met.		
BO-028	The TCS shall setup and maintain all account types including ETC Accounts, Registered Video Accounts, Unregistered Video accounts, commercial accounts and government accounts.	X	
	Proposer Response: [redacted]		
BO-029	Any external stakeholders including but not limited to the Joint Board shall have access to review, view, and examine customer accounts in accordance with the approved System Access Control Plan.	X	
	Proposer Response: The TCS complies with requirement BO-029 in the following manner: During the design phase, the Joint Board will specify the external users that require remote access to the TCS, so that they may conduct any audits of the system that they deem necessary. The roles will be permitted the ability view and examine data remotely. Through secure remote access, such as VPN, or local system access, the users would have a user ID and role in the same manner as Sanef operations employees, with a specified set of access rights and privileges. In general, these rights and privileges would not include the right to modify or add data, only to view it. This information should be captured in the System Access Control Plan.		
BO-030	The TCS shall display in the account the most current address available through DMV look-up or the address provided by the customer.	X	
	Proposer Response: The TCS complies with requirement BO-030 in the following manner: The TCS has several sources for customer address information, user registration, DMV lookup, or skip trace data, such as post office, courts, collection agency etc. The TCS maintains an address history for all accounts. What is displayed to the CSR is the most recently updated address, the active address used for all mailed notices. In general, the most recent customer input is the primary		

Req ID	Back office (Section BO)	Required	Value Add
	account address, unless mail has been returned from that address, in which case other data is used for the customer. If the driver does not have an account, DMV or data from third party aggregators is used.		
BO-031	It is desired that the TCS store previous customer addresses in the account and that they are easily viewable by authorized users.		X
	[redacted]		
BO-032	The TCS shall include functionality to re-look-up addresses after lapse of a configurable period of time to ensure the correct address is being used by the Toll System Provider.	X	
	Note: This functionality is intended to ensure the Toll System Provider has current name and address information for infrequent unregistered customers. Proposer Response: The TCS complies with requirement BO-032 in the following manner: Unregistered and violation accounts that require (not anonymous) DMV information have a request generated, based on license plate information, every "N" days, where "N" is a configurable number. This number of days is stored within TollAdmin and can be modified at any time. The configuration (number of days after which a new lookup is initiated) prior to opening will be implemented in accordance with the business rules as approved by the Joint Board. For registered accounts, no address lookup will be instigated unless mail is returned from the registered user address.		
BO-033	The TCS shall have functionality or operations processes to address Customer Statements or Violations notices returned with NIXIE (as defined by the United States Postal Service) codes. The TCS shall use skip tracing or other methods to find and update the correct address associated with customer accounts.	X	
	Proposer Response: The TCS complies with requirement BO-033 in the following manner: FastToll ERP has standard business processes that can be modified to meet the requirements of LSIORB. When a NIXIE is received from the postal service, FastToll ERP has several resources to establish a valid address for the account. We intend to use these features in the following order: • Customer contact information such as email, SMS or telephone contact—contact the customer and ask for an updated postal address; • DMV Address; • Skip tracing through third party resources.		
BO-034	The TCS shall provide Customer Statements that shall be configurable by account type.	X	

Req ID	Back office (Section BO)	Required	Value Add
	Proposer Response: The TCS complies with requirement BO-034 in the following manner: A variety of different statement templates are used by the Sanef Back Office to provide customer statements for the different account types. FastToll ERP permits that each different account type can have its own statement template or invoice format. We will propose templates to the Joint Board for the various account types during business rules discussions.		
BO-035	Customer Statements shall be provided to toll patrons monthly and as requested at any time by mail and email. Customers may opt in and opt out of receiving statements.	X	
	Proposer Response: [redacted]		
BO-036	Customer Statements shall be configurable to include a fee to the customer account from $0-$99 per statement. The fee shall be established by the Joint Board.	X	
	Proposer Response: [redacted]		

Req ID	Back office (Section BO)	Required	Value Add
	[redacted]		
BO-037	The Toll System Provider shall have a near-real time interface with the Roadside System to transmit Traffic Transaction information from the Roadside System to the BOS and transmit configuration or customer information from the BOS to the Roadside System. Near real time requirements are defined in SA-021.	X	
	Proposer Response: The TCS complies with requirement BO-037 in the following manner: The Sanef TCS solution is being proposed in a three-tier configuration. The first one is the FastFlow tier, which includes the RSS, where the roadside transactions are generated. The RSS passes the transactions in near real-time to the second tier (Host level), where the FastHost servers reside. This tier validates the traffic transaction received, and associates vehicle images, then sends these to the top tier, where FastToll ERP resides. The reverse direction is the transmission path for files destined to the roadside (tag, license plate lists, configuration, messages, etc.). They are created in the top tier and through FastHost, work their way to the FastFlow roadside system.		
BO-038	The Toll System Provider shall integrate the BOS with the changeable message panels as outlined in Technical Requirements Section RS. A record of all Toll Rate Schedules shall be stored in the BOS in accordance with the backup and archiving timeframe for the TCS.	X	
	Proposer Response: The TCS complies with requirement BO-038 in the following manner: The BOS will communicate with the Changeable Message Panels (CMP) via the TollHost layer. Toll rate messages that are sent to the CMP will be acknowledged, by the CMP in the form of an ACK, with the test displayed stored in the TollHost database. The Toll Host will have its own historical database of the messages sent to the CMP's and the displayed text response. The TollHost will ensure that the rates displayed are properly applied to the traffic transactions received from the roadside, preventing traffic transactions from being incorrectly charged. The BOS will have its own historical record of the messages sent to the TollHost, a separate process will identify any discrepancies between the databases. CSR's will have access to the BOS database information in order to resolve any customer complaints or issues.		
BO-039	The TCS shall have an interface with the E-ZPass system and interoperable agencies, and the Toll System Provider shall comply with the E-ZPass Operating Agreement, any agreements with other interoperable agencies, and all applicable amendments.	X	
	Note: The E-ZPass Operating Agreement and all associated and applicable amendments as of the date of the RFP are available in the Reference Information Documents. **Proposer Response:** The TCS complies with requirement BO-039 in the following manner: The Sanef Back Office includes the **FastToll Interop™** product, which provides all the functionally necessary to participate in the IAG as a full member. This software is currently operational in the Rhode Island Bridge and Tunnel Authority (RITBA) and the Niagara Falls Bridge Commission (NFBC), both of which are members of the IAG and exchange E-ZPass data with all tag-issuing IAG members. The system includes the complete set of interface files, communication capabilities, and reporting necessary to participate in the EZ-Pass program. Furthermore, FastToll Interop also includes the ability to interface with the Alliance for Toll Interoperability (ATI) hub, operated by **Sanef,** which would eventually allow LSIORB to interoperate with other, non-E-ZPass agencies, for image-based transactions, if the Joint Board chooses to pursue ATI membership.		

Req ID	Back office (Section BO)	Required	Value Add
BO-040	[Intentionally not used.]		
BO-041	The Toll System Provider's BOS architecture shall operate within limited degradation for specific failure modes that shall be established during the Business Rules and system architecture review.	X	
	Proposer Response: The TCS complies with requirement BO-041 in the following manner: The Sanef TCS physical architecture operates in several different degraded modes, but first and foremost is designed to provide high availability. Failover network paths are comprised of redundant switches, routers, firewalls and load balancers. The design also includes off-site disaster recovery and can support remote operations as well. The entire TCS system is designed to function with degradation or service interruptions. For example, in the event of communications failure, transactions from the roadside can be buffered locally until communications is restored. Once restored, the system processes these buffered transactions and recovers quickly. Sanef ITS has, on several occasions, demonstrated performance in case of a communications failure as part of our standard testing procedures, both for FAT SAT. If there should be an issue with a table in the database, the system as a whole would continue to function with any degradation being limited to the functionality associated with that table. The errors would be logged and an alarm generated, so that a DBA could address the problem. During the Business Rules and Architecture review, we will discuss and finalize the limits of degraded functionality with the Joint Board.		
BO-042	The Toll System Provider shall process customer payments for tolls, fees and fines via credit card, check, money order, or cash. The Toll System Provider shall provide system functionality to encourage customers to establish auto replenishments for pre-paid accounts.	X	
	Proposer Response: The TCS complies with requirement BO-042 in the following manner: The Sanef Customer web site provides many opportunities and reminders that encourage customer to register an account. The website also publicizes the availability and convenience of automatic credit replenishment as a payment option. Sanef has assisted greenfield clients with marketing efforts during initial account registration to enable automatic replenishment. The Sanef Back Office supports pre-paid and post-paid account types for both private and commercial accounts. The design has a very flexible tolling schema permitting different toll rates to be applied for pre-paid vs. post-paid, Video vs. ETC accounts, registered vs. un-registered, pre-registered and anonymous. This toll rate pricing flexibility allows for the creation of programs that provide a financial benefit for users of the Joint Board facilities to adopt the usage of prepaid Tag based accounts. The Sanef Back Office has a financial core that posts payments to accounts (pre-paid, post-paid and violation) and applies the amount as either credits for prepaid accounts for future tolls, or to cover violations, other fees and previous tolling charges. The financial core supports multiple automatic or on-demand payment methods such as, Credit/Debit cards & ACH payments. Physical payment can be made by mail or walk-in in the form of cash (will be discouraged by mail), credit & debit, check and money order. The payment channels available to customers are Internet, IVR, phone, mail and walk-in at the CSC.		
BO-043	The Toll System Provider shall safeguard cash deposits and shall provide armored car services in accordance with the Safety Plan.	X	
	Proposer Response: The TCS complies with requirement BO-043 in the following manner: **Sanef** has, as part of its other management and operations contracts, the assumption of liability for all revenues received, including guaranteeing their safe deposit to the appropriate financial institution. Sanef will safeguard cash when it is at Sanef facilities (walk-up center CSC) by storing it in lockboxes. Sanef ITS operations will contract with a local, fully bonded armored car service provider to transport funds received to the recipient as designated by the Joint Board. The process for securing the funds is blind to the persons involved: they are not made aware of the amounts being transported. Financial reconciliation of the transferred funds is made from the end points and is performed by administrative staff that never comes		

Req ID	Back office (Section BO)	Required	Value Add
	into direct contact with the funds. Any discrepancy is flagged and audited according to the business rules. The details of the cash handling process will be provided in the safety plan along with the physical cash controls, procedures for mitigating the risk or robbery at the facility as well as silent alarms and communication procedures and cooperation with law enforcement.		
BO-044	The TCS shall process refund requests from customers. Credit card or debit card based toll accounts shall be refunded to the same card. Cash toll accounts shall be refunded with a check mailed to the address of record on the account.	X	
	Proposer Response: The TCS complies with requirement BO-044 in the following manner: The **Sanef** Back Office provides refunds to customer's credit and debit accounts directly via the payment clearinghouse provider—which ensures that credit and debit card refunds occur on the same card. These refunds are recorded in the financial module and are reflected in customer statements and internal financial reports. All other funds are refunded by check to the account holder. When a refund is requested by an account holder for overpayment, double billing, or other, the refund goes into a work queue for the audit staff to review and approve. For funds that exceed a certain dollar limit, additional approval (by multiple or higher-level staff) may be required. Once approval has been granted, the system will generate a check that will either require a signature or utilize a digital signature. FastToll ERP workflow is flexible in that, several aspects of the process are table driven and do not require the modification of any coding. For example, a time threshold for a manual signature to be made that when crossed the transaction is canceled; or a dollar amount threshold that when crossed will require additional approval, such as a supervisor's signature, to proceed with the transaction. Each threshold can be increased or decreased based upon the project requirements. During the development of the business rules, the standard workflow process will be presented in detail and modified to meet the requirements of the Joint Board.		
BO-045	Lockbox payments shall be received through an internal and external lockbox. The TCS shall process configurable returned check fees and TSP shall support the occasional times when cash is mailed to the lockbox. Returned check fees shall be identified and the appropriate account shall be charged a configurable fee for a returned check and record of the returned check and the fee shall be linked to the customer account in the TCS.	X	
	Proposer Response: [redacted]		
BO-046	The Customer Website shall provide access for customers who do not have a Transponder to pay tolls, to pay Violations, to sign up for Registered Video accounts and ETC Accounts, and to manage Unregistered Video accounts.	X	

Req ID	Back office (Section BO)	Required	Value Add
	Note: Unregistered Video Accounts may be available from the web, depending on the Proposer's design, to pay for tolls prior to the issuance of a Customer Statement functionality as described in BO-129. **Proposer Response:** [redacted]		
BO-047	It is desired that the TCS be configurable by System operators to establish payment plan arrangements for certain customers.		X
	Proposer Response: The TCS complies with requirement BO-047 in the following manner: The FastToll ERP financial module permits the configuration of payment plans for revenue recovery. The plans permit customers to spread payments out over time and also for CSR's to write off some of the account debt related to fees and tolls. These types of plans permit the Joint Board to implement programs that are oriented towards converting violations accounts to registered user accounts. These are handled on a case-by-case basis and depending upon the business rules, typically rely on supervisor approval. We will discuss these procedures with the Joint Board when we develop business rules, and configure the system to support payment plans as desired by the Joint Board.		
BO-048	The TCS shall provide functionality for customer account communications and related system updates for adding vehicles to an account, requesting a Transponder, account maintenance communications, and payments, among other customer account communications.	X	

Req ID	Back office (Section BO)	Required	Value Add
	[redacted]		
BO-049	Intentionally not used.		
BO-050	The TCS shall transfer payments between ETC Accounts, Registered Video accounts, Unregistered Video accounts and Violation accounts. The TCS shall accept post payments or other Joint Board designated account types.	X	
	Proposer Response: The TCS complies with requirement BO-050 in the following manner: FastToll ERP supports transferring complete existing payment history and balances to the new account type when an account type is modified. Fast Toll ERP permits both, pre and post-payment for all account types. We will discuss with the Joint Board what account types should have which payment options in the business rules discussions.		
BO-051	The TCS shall associate a credit card to an account for the purpose of toll payment where necessary as indicated in the Business Rules. The credit card transactions, debit card transactions, automated clearing house payments and refunds shall be processed in near-real-time. The TCS shall provide for the credit card information to be added, changed, or deleted on the customer account. Near-real-time is defined as an authorization code provided within 2 minutes. The settlement of the transaction may occur up to 72 hours after the time of the authorization.	X	
	Proposer Response: The TCS complies with requirement BO-051 in the following manner: The TCS utilizes an internal module called “CSC Pay,” which interfaces with external payment gateways, banks, and others. This module is capable of processing credit, debit and ACH transactions in both near real time and batch process. Near real-time is less than 2 minutes with settlement in less than 72 hours. Near real-time is typically used for all on-demand (manual one-time) payments, and provides an almost immediate response of transaction approval or denial. Automatic account replenishments are typically implemented as a batch process that initiates at midnight on the scheduled dates. The settlement for batch transaction processing is also within the 72-hour window.		
BO-052	The TCS shall accept and process various types of payments including credit card, debit card, automated clearing house, money order, cashier’s check, traveler’s check, personal check and cash, and shall track those payments and methods of payment, posting them to the appropriate customer account in near-real-time. The TCS shall provide multiple payment options within one Financial Transaction and shall accept partial payments towards the account balance based on the Traffic Transaction and Financial Transaction posting date/time in a first-in, first-out (FIFO) manner. For credit card, debit cards, and automated clearing house payments, please see definition of near-real-time in BO-051. For money order, cashier’s check, traveler’s check, personal check and cash, near-real-time means the payments shall be posted to the customer’s account no later than 1 business day from the bank making the funds available for that financial instrument.	X	

Req ID	Back office (Section BO)	Required	Value Add
	Proposer Response: [redacted]		
BO-053	The TCS shall allow for review of Customer Statements by customers at the Walk-Up Centers and the Customer Website.	X	
	Note: The Proposer shall include other channels to present the Customer Statements in its Technical Response Form. **Proposer Response:** The TCS complies with requirement BO-053 in the following manner: Customer statements are available to be printed through the TollCRM system by the CSR, present at the Walk-up Center, website, mobile app, and satellite locations. The Website provides the capability of viewing, locally saving, and printing the statements. Printing is also possible from mobile devices. For all customer print methods, the customer must have a printer that is configured to their devices.		
BO-054	The Toll System Provider shall provide a credit card processing merchant and system for approval by the Joint Board.	X	
	Note: The Proposer shall include in this Technical Response Form the credit card fees and rates expected to be paid as Pass Through Cost Items during the Term of this Agreement. **Proposer Response:** [redacted]		
BO-055	The TCS shall provide for automatic replenishment of funds for a toll customer account and provide for the acceptance of notifications from banking institutions	X	

Req ID	Back office (Section BO)	Required	Value Add
	regarding status of credit, debit, or automated clearing house accounts.		
	Proposer Response: [redacted]		

Req ID	Back office (Section BO)	Required	Value Add
	[redacted]		
BO-056	The Toll System Provider shall provide a license plate image review system and operations.	X	
	Proposer Response: [redacted]		

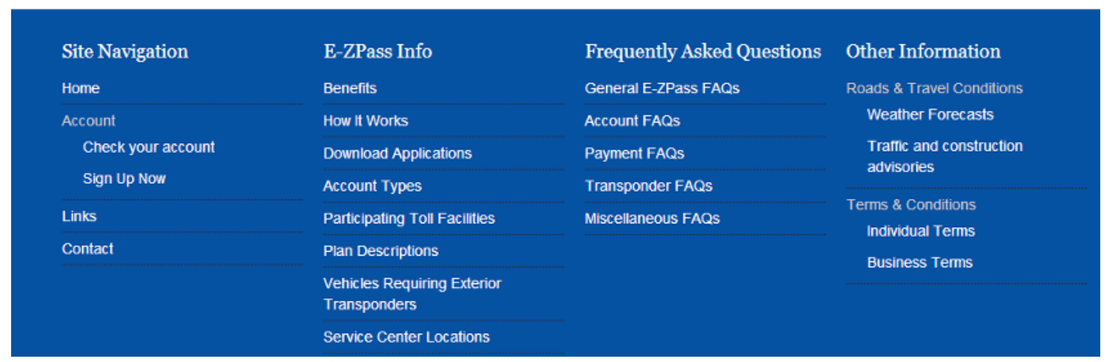
Req ID	Back office (Section BO)	Required	Value Add
	[redacted]		
BO-057	The TCS shall manually view images to confirm or correct the vehicle LPN and state information when below a specified configuration OCR confidence threshold.	X	

Req ID	Back office (Section BO)	Required	Value Add
	Proposer Response: [redacted]		
BO-058	The TCS shall report an exception when the number of image based trips exceeds a configurable threshold for an ETC Account. The TCS shall change the toll rate from the ETC rate to an Unregistered Video or Registered Video toll rate in accordance with the Business Rules once this threshold is reached.	X	
	Proposer Response: The TCS complies with requirement BO-058 in the following manner: The TCS allows for the tracking of image-based tolling (I-Toll) events. These events are when an image is used to post a transaction to an ETC account (account with a tag associated). Based on the Joint Board approved business rules, including the notification of the customer that his/her tag may not be functioning correctly, the system will compare the number of image-based transactions to a threshold and when the threshold is exceeded, it will no longer charge the ETC rate but the Unregistered or Registered Video toll rate as appropriate. This transaction rate change is applied to either the entire account or to the individual transponder/LPN combination that has reached the threshold, depending on the business rules chosen by the board.		
BO-059	The TCS shall identify License Plate Numbers and jurisdictions from all 50 states and all provinces of Canada.	X	
	Note: The Proposer shall identify the number of plates and plate types the OCR Software can be tuned to recognize in this Technical Response Form. The Proposer shall provide a list of the 15 states expected to originate the most Traffic Transactions within 90 days after NTP. **Proposer Response:** The TCS complies with requirement BO-059 in the following manner: The ALPR software is designed for the North American market. It can recognize all 50 states and all Canadian provinces, and can also learn license plate patterns. The ALPR and OCR software will be tuned to the plates for the surrounding states and the license plate composition of the traffic that uses the facilities. Sanef ITS expects the following states to be top 15 states that transactions originate from:		

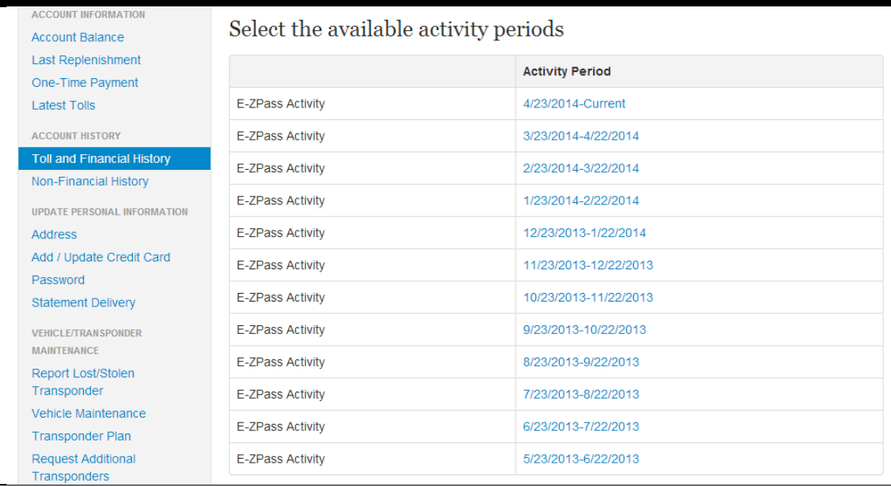
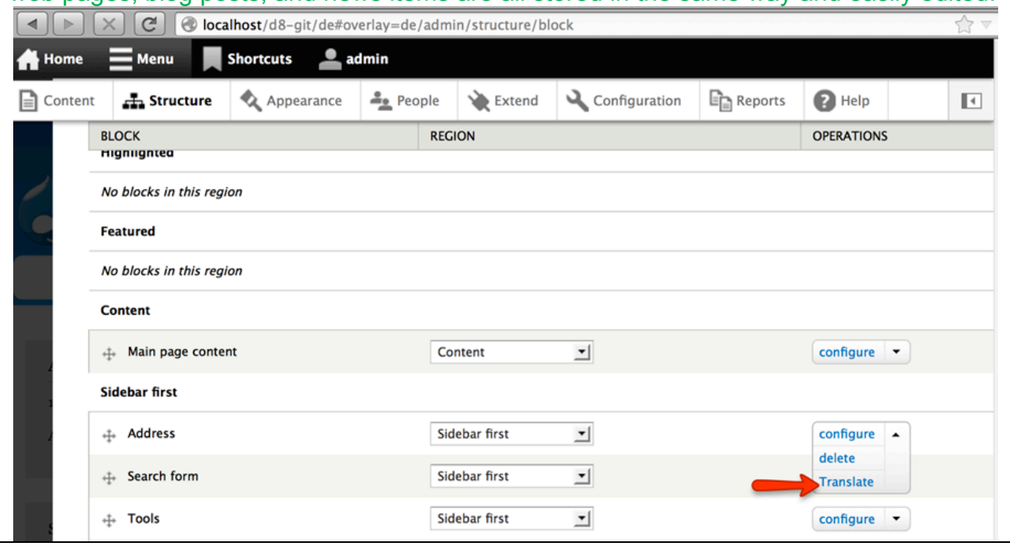
Req ID	Back office (Section BO)	Required	Value Add
	• Indiana • Kentucky • Illinois • Ohio • Tennessee • Pennsylvania • Michigan • Wisconsin • Georgia • Florida • Alabama • Missouri • Iowa • Virginia • West Virginia As of now no formal study was performed to determine the state-by-state traffic statics. To efficiently meet the 15 state requirement in this section of the RFP, Sanef would seek to review the traffic study provided to the Joint Board by its consultants and select the 15 states that, based on the study results, represent the highest traffic volumes.		
BO-060	It is a desired that the TCS provide an interface to an electronic bulk mailing system for mailing of Correspondences, statements, bills, and notices to customers.		X
	Proposer Response: The TCS complies with requirement BO-060 in the following manner: The TCS has a print house interface for performing bulk mailing of mailing of correspondences, statements, bills, and notices to customers. This interface also permits the validation of files sent to the print house, has quality assurance processes, and has been used with several print house service providers.		
BO-061	The Customer Website shall allow customers to establish, maintain, update, and review account information, order Transponders, pay Violations, pay "pay by plate" Traffic Transactions, establish Registered Video accounts, and ETC Accounts and make payments via a PCI compliant secure methodology. Customers shall be able to complete all Transaction activities through the Customer Website. The Customer Website shall be user friendly, high quality, attractive and easily understood by toll patrons. The Toll System Provider shall coordinate Customer Website design and content with the marketing firm engaged by the Joint Board.	X	
	Proposer Response: [redacted]		

Req ID	Back office (Section BO)	Required	Value Add
	[redacted]		
	[redacted]		

Req ID	Back office (Section BO)	Required	Value Add
	[redacted]		
BO-062	The BOS shall provide information to the CSR regarding account status including but not limited to balance of account, expired credit card information, excessive image Traffic Transactions notification, and outstanding Customer Statements.	X	

Req ID	Back office (Section BO)	Required	Value Add
	Proposer Response: [redacted]		
BO-063	The Customer Website shall include the following information: road information, branding information, Joint Board contact information (email and phone number), information about how to open a Registered Video account and an ETC Account, information about how to pay a toll after a customer has travelled a Bridge without a pre-paid account, frequently asked questions, any upcoming maintenance or other information and links to other websites.	X	
	Proposer Response: The TCS complies with requirement BO-063 in the following manner: The public website provided will include the following Joint Board desired information: Road information, branding information, Joint Board contact information (email and phone number), information about how to open a Registered Video account, an ETC Account, how to pay a toll after a customer has travelled a Bridge without a pre-paid account, frequently asked questions, any upcoming maintenance or other information and links to other websites. In addition, the website will include a wide array of static information concerning toll rates, hours of operations, how to use the road, and any necessary forms. Sanef will work with the Joint Board to ensure that all of the information on the site meets the needs to inform the public about the program and encourages account registration and road usage. Sample content for a tolling website is shown to the right.  		
BO-064	The Customer Website shall incorporate security standards to protect customers from unauthorized access and restrict access to any unauthorized users. At a	X	

Req ID	Back office (Section BO)	Required	Value Add
	minimum, customer data shall be password protected and the Customer Website shall include a password change policy. SSL encryption shall be implemented by the Toll System Provider.		
	Note: The Toll System Provider shall also identify in this Technical Response Form other security measures to be used in the TCS. **Proposer Response:** The TCS complies with requirement BO-064 in the following manner. The Sanef back office is designed with the highest security standards to protect customer's personal and financial data from unauthorized access. For example, the public website enables users to establish and maintain user names and passwords necessary to access the site. It also implements a password change policy to ensure customers change their passwords regularly. The security and protection of user information is accomplished through physical firewalls and DMZ (Demilitarized Zone), areas as well as the use of threat detection software and data encryption. The DMZ contains tiers that isolate the public zone, such as the internet, from the internal zone, such as the LAN. This zone sits between the public network and the internal network. An intruder can only access the DMZ equipment and no other part of the network. SSL encryption is employed, as well as other security measures, such as PCI methods (for secure card transactions) and tokenization to guard the data and its transmission. Tokenization replaces the original the original data with tokens that are references to the data. The tokenization system uses the tokens to map back to the original data. Tokenized data cannot be mapped to the original data without the tokenization system. The diagram to the right shows the application security methods employed to keep the data safe while allowing access to account information within the CSC database. [redacted]		
BO-065	The Customer Website content management system and actual Customer Website shall be in English.	X	
	Proposer Response: The TCS complies with requirement BO-065 in the following manner: The Sanef Customer Website and content management system will both be provided in English.		
BO-066	It is desired that the Customer Website provide other language support without re-programming the Customer Website.		X
	Proposer Response: The TCS complies with requirement BO-066 in the following manner: The Sanef Customer website uses MicroSoft.net resources and themes to enable the website to support multiple languages without re-programming. All that is required is the conversion of text to the new language in the content management system.		
BO-067	The Customer Website shall include access for customers to Customer Statements and historical data, which historical data shall be available for two years by accessing the Customer Website, and then archived.	X	
	Proposer Response:		

Req ID	Back office (Section BO)	Required	Value Add
	The TCS complies with requirement BO-067 in the following manner: The Sanef website will maintain historical account and statement information for customer web access for a minimum of two years. Customers can easily select the dates and times of the account information they desire from intuitive menus on the website. After the two year period, the information will be archived and not available directly to customers on the website, but will be available to CSR's from their workstations. 		
BO-068	It is desired that the Customer Website have a user friendly content management system that allows the Joint Board to update content on the Customer Website without a programmer or any knowledge of programming.		X
	Proposer Response: The TCS complies with requirement BO-068 in the following manner: The **Sanef** TCS will allow the Joint Board to update Content on specific pages of the website. To do this, the TCS will utilize the third party Drupal content management system. Drupal is a content management system that allows the user to create and maintain many different types of web pages without needing to know any coding languages. Drupal is very easy to use and treats most content types as variations on the same concept: static web pages, blog posts, and news items are all stored in the same way and easily edited. 		

Req ID	Back office (Section BO)	Required	Value Add
BO-069	The IVR and Customer Website shall verify the customer's identity before disclosing or making any updates to customer data.	X	
	Proposer Response: The TCS complies with requirement BO-069 in the following manner. The IVR system requests the user to enter their 9-digit Account Number and a 4-digit PIN to access their account. For the website, users register with a user id and password. Account access to both the IVR and the website is not permitted without the correct combination of data for the user selected service channel.		
BO-070	The IVR shall provide access to general information, the option to direct the call to an operator, or direct the customer to select a specific option that corresponds to the customer's inquiry. The IVR shall support a second language, to be determined later by the Joint Board, without any Software changes.	X	
	Proposer Response: [redacted]		

Req ID	Back office (Section BO)	Required	Value Add
	[redacted]		
BO-071	It is desired that the IVR measure and report a KPI for call answering performance for all calls transferred to agents. The metrics shall include the total customer call duration from the start of the IVR through completion on the automated system or with the CSR.		X
	Proposer Response: The TCS complies with requirement BO-071 in the following manner: The Sanef Back Office IVR system produces Key Performance Indicator reports for several metrics related to call answering and transferring to CSRs. Some of these metrics detail the average and maximum length of time of a call from the start of the IVR through the completion on either the IVR or with a CSR, the average number of steps within the IVR used by callers, call drop rates, the effectiveness of the IVR as a percentage of CSC calls received (i.e., what percentage of calls could be sufficiently answered by the IVR alone) and others.		
BO-072	The TCS shall maintain a record of customer communications and interactions through the IVR and the Customer Website for customer, Bridge use and account analysis.	X	
	Proposer Response: The TCS complies with requirement BO-072 in the following manner: All IVR conversations and customer website exchanges are logged and recorded in the customer's account history. This history is available through both the TollCRM account history and the Customer website. During the business rules review the Joint Board may select how and to what extent this information is available to the account holder. The information collected can be used for bridge use and account analysis by the Joint Board.		
BO-073	The IVR shall be integrated with the CSC to allow for transfer of calls and updates to the accounts in near real time. For the purpose of this requirement near real time shall mean that the call is transferred within 2 seconds upon initiation of a transfer by the customer.	X	
	Proposer Response: The TCS complies with requirement BO-073 in the following manner: The IVR is fully integrated with FastToll ERP, our CSC application, allowing for the transfer of inbound calls to CSR's in less than 2 seconds from when the customer initiates the transfer. Users who make updates to their accounts using the IVR have the changes take effect also in less than 2 seconds.		
BO-074	The Customer Website and IVR shall allow the customers to make replenishments, post-paid toll payments and Violation payments, and update account information.	X	
	Note: The Proposer shall describe each payment channel on the Technical Response Form. **Proposer Response:** The TCS complies with requirement BO-074 in the following manner. The Customer Website and IVR both permit users to make one-time payments that are used for post-paid and violation traffic transactions. Both also permit users to update their account information and replenish their pre-paid accounts. Both of these self-service channels accept card payments and ACH for settling customer accounts.		
BO-075	The IVR and call management solution shall track and compile performance metrics statistics for CSC activities. The IVR shall track performance metrics statistics by hour, by day and by month for the following metrics and shall provide the Joint Board with a report of the same within 1 business day upon request and as part of the Monthly Operations and Maintenance Report. The minimum statistics to be tracked and reported are 1. Total number of calls received, 2. Total number of calls accepted by customer service representatives, 3. Average time to answer, 4. Maximum time to answer, 5. Total number of calls that exceed configurable, specified hold time(s), and 6. Total number of abandoned calls.	X	
	Proposer Response: [redacted]		

Req ID	Back office (Section BO)	Required	Value Add
	[redacted]		
BO-076	The Customer Website shall be updated in near-real time with information related to Traffic Transactions, Customer Statements, account maintenance, payments, and any other information required by the Joint Board. Near real time is defined as an update to the BOS at least every 24 hours so that TSP shall maintain a complete history of account information.	X	
	Proposer Response: The TCS complies with requirement BO-076 in the following manner: The Sanef Back Office supports near-real-time updates of the customer website. For many events (traffic transactions, customer statements, account maintenance, payments, and others) updates are made within 2 seconds. For other events like traffic transactions that have discrepancies that require manual review, the website may take up to 24 hours to reflect the event. The Back Office logs every update to the website and maintains a complete history. Many of the updates are managed through the business rules engine, which will be configured in accordance with the business rules as defined by the Joint Board.		
BO-077	The Toll System Provider shall provide a backup and archiving system for all components of the TCS.	X	
	Proposer Response: The TCS complies with requirement BO-077 in the following manner: Sanef ITS has implemented, a backup and archiving system designed to meet our clients' data protection needs on every tolling project we have delivered. For this project Sanef will deliver a backup and archiving solution to keep both the TCS for both the primary and secondary sites synchronized and protected from data loss. Our system is described below in the response to BO-78.		
BO-078	All accounts, customer information, IVR, Customer Website, and reports shall at a minimum be backed up every day. All System configurations required in recovering the System in case of outage or failure of any component shall be backed up every quarter and immediately whenever changes are made. These System confirmation backups shall include application, database and operating system settings. The backup data shall be retained off site from the CSC and TCS at the approved DR site.	X	
	Note: The TSP shall describe in this Technical Response Form the backup and archiving plan for the TCS. **Proposer Response:** The TCS complies with requirement BO-078 in the following manner: **Back-up** The backup solution utilizes a tape library that typically holds up to 48 tapes, and backs up data at the rate of at least 504 GB of data per hour. The device is attached through an iSCSI interface to the SAN and backup server. The backup server performs centralized backups of all PSC servers using the tape backup library and the disk located in an advanced SAN array. The **Sanef ITS** backup software is used to protect the TCS database and applications. It delivers reliable backup and recovery solutions, and ensures that critical information on virtual and physical systems is always protected and easily restored, including TCS operating systems and		

Req ID	Back office (Section BO)	Required	Value Add
	configurations. The backup server at the disaster recovery (DR) site (far away from the primary CSC) performs centralized backups for all servers with the following operational databases backup plan: • One FULL backup once every week, equivalent to the confirmation backup in the requirement—literally everything in the system; • One DIFFERENTIAL backup once every day (all changes made on that day, including accounts, customer information, IVR, website, reports and all major system changes) ; • One TRANSACTIONAL backup once every 15 minutes (all transactions processed in the 15 minute period). **Archiving** The TCS archives data and images based on a configurable retention period (age of transactions) and account status (i.e., if no payments are outstanding). All archived data can subsequently be retrieved if needed from a media source (tape or disk). From a capacity requirements viewpoint, **Sanef ITS** initially configures the Back Office archiving processes in accordance with the retention requirements of each project. A common example of retention requirements, seen on several projects, is that the system should be able to store: • Transaction data and images in online storage at the Back Office 2 years (configurable); after that, the data is archived. • Transaction data and images associated with unresolved transactions in online storage at the Back Office for 2 years (configurable); after that, the data is archived. • All other TCS data is stored online for 2 years (configurable). The Back Office periodically archives data and images that have passed their online retention period to disk (archive data share and archive database). This data is subsequently copied to tape (removable media). This data can be restored at a later date if the need arises. The Back Office maintains a history of all data archived so that it is possible to find the location (on disk or tape) of any archived data for a specific account. When implementing **Sanef ITS** Back Office for a new project, **Sanef ITS technologies** reviews the Information Lifecycle Management (ILM) and local data retention regulations to verify that Back Office archiving policies meet the business processing needs and are compliant with legal views of archiving and private data retention. When we have done so for LSIORB, we will review our planned policies with the Joint Board.		
BO-079	The Toll System Provider shall archive data no later than every month to an offsite system. Archived data shall be available for 10 years. Upon request, data shall be recovered and available to the user for analysis within 2 business days.	X	
	Proposer Response: The TCS complies with requirement BO-079 in the following manner: Archive TCS data will be transferred every 4 weeks to the disaster recovery (DR) site for offsite storage. All archived data will be available to the Joint Board for no less than 10 years before it is permanently destroyed or turned over to the Joint Board, as requested by the Joint Board. Sanef ITS will deliver this archived data to the Joint Board within 2 business days of any request.		
BO-080	All credit card payment processing shall be PCI DSS Security Standards Council compliant. The TCS database shall comply with all applicable standards issued by the PCI DSS Security Standards Council, including the PCI DSS at the start of operations in the BOS, and remain compliant throughout the Contract Term.	X	

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	Proposer Response: [redacted]		
BO-081	All external internet protocol addresses shall undergo a vulnerability scan at least quarterly by a qualified vendor, pursuant to the PCI DSS Data Security Standard. The TSP shall provide a copy of the current quarterly vulnerability scan report to the Joint Board within 10 business days of request by the Joint Board at any time during the Contract Term.	X	
	Proposer Response: The TCS complies with requirement BO-081 in the following manner: Sanef will work with a qualified vendor to perform and report on the vulnerability scan on external IP addresses quarterly during the life of the contract. This report will be provided to the Joint Board within 10 days of any request received.		
BO-082	There shall be no direct user access to the BOS database management system by any interactive or system users. All access to the BOS database management solution shall be through BOS middleware. User authentication and access to the BOS database management solution shall be managed by the middleware application services using generic or function-related database connections.	X	
	Note: The Proposer shall describe in this Technical Response Form access to the database system for reporting by system users and interactive (human) users. **Proposer Response:** The TCS complies with requirement BO-082 in the following manner: Only Authorized Data Base Administrators (DBAs) have direct access to the database. DBA access necessary to maintain the database, as well as to optimize performance and perform other administrative tasks. All logins by every user of the database is recorded, as is any data created, edited or deleted in the tables. These logs are under the direct control of the database administrator and can be exported, archived or printed. All other authorized users of FastToll ERP have access to the database only via the application itself, which runs as middleware. FastToll ERP functions at the application layer of the overall system. The connections from FastToll ERP to the Microsoft SQL database are managed via generic and function connections such as OLTP and others. All changes and modifications to the database that are made through users of FastToll ERP are logged and available to the DBAs.		
BO-083	All TCS database management system scheduled jobs shall be executed under a non-interactive account.	X	
	Proposer Response: The TCS complies with requirement BO-084 in the following manner: A non-interactive account, the SQLEXEC general services account, is used to execute all database management scheduled jobs.		
BO-084	The BOS database management solution shall not permit any modifications or deletions of the original Traffic Transactions, Financial Transactions, and Event Transactions stored in the BOS database.	X	

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	Proposer Response: The TCS complies with requirement BO-084 in the following manner: The Microsoft SQL database will be configured so that the data tables do not allow for deletions of original Traffic, Financial, and Event Transactions.		
BO-085	All TCS database management system records shall provide version control and shall be traceable for all components of the TCS. The TCS database management solution audit trail information for each correction entry shall include, at a minimum, the date and time of the change, identification of the person or automated transaction function initiating the change, and reason code or descriptor justifying the change.	X	
	Proposer Response: The TCS complies with requirement BO-085 in the following manner: The TCS uses Microsoft SQL configured to provide a complete audit trail for the data stored in the database, including version control. This audit trail encompasses the creation of records, the editing of records, and any attempted or successful deletion. It also records the user identity (including automated transactions) and the date/time that the event took place, depending upon the event, users may need to provide a description/reason code for the event to be recorded. For an example, a change of address entered by a CSR would require a description, and an event such as a credit card replenishment, which is routine, may not require such a description.		
BO-086	The TCS database management solution shall be secure and provide automatic credit card industry standard encryption of all credit and debit card data transmitted to the database via customer service representatives or received via the internet.	X	
	Proposer Response: The TCS complies with requirement BO-086 in the following manner: FastToll ERP uses tokenization, an industry standard, for of all payment card information transmission, which prevents credit card numbers from being intercepted via packet sniffing and related techniques, and is PCI-DSS compliant, another important credit card industry standard, both for credit/debit payments made through the website or via CSRs. Actual complete payment card information is never stored in the FastToll ERP database, only the last 4 digits are kept. FastToll ERP uses tokens instead of live data (credit and debit card). The tokens are sent to the payment clearinghouse that is permitted to de-tokenize the data for the purpose of processing payments. Furthermore, the connection between the CSC and the payment processor gateway is over the secure industry-standard SSL protocol where the SSL certificates are verified to be valid before the connection can be used to transport any tokens.		
BO-087	The TCS database management solution shall provide the following: 1) automatic setup, job scheduling, and execution of backup and recovery scripts; 2) real-time diagnostic testing and problem resolution scripts,3) historical performance data and assistance in database server capacity planning; 4) aid in automating, on a24 hours per day, 7 days per week, monitoring of priority events based on critical threshold; 5) management of database schema modifications; and 6) performance tuning capabilities including, but not be limited to server, database, table, index and query levels.	X	
	Proposer Response: The TCS complies with requirement BO-087 in the following manner: The FastToll ERP database is based on Microsoft SQL server, which can provide all of the database features required here. The Microsoft SQL database management tools will be configured or utilized by the DBA so that the following requirements are met: 1. The creation, set up, scheduling and storing of scheduled jobs and backup and recovery scripts; 2. The creation and execution of scripts in real time to test and monitor problem resolution scripts by analyzing data, correcting data and comparing data; 3. Record the performance of the database to establish a historical record which will be utilized to assist in the planning of database optimization, server capacity expansion and future storage expansion; 4. Configure the database, so that it will self-monitor on a continuous basis, report and log any exceptions, other anomalies, or events that cause any predefined thresholds to be exceeded. Any such alarms created will be sent either to the DBA directly by the database, or will be reported to the DBA via the MOMS or other third party tools used in the TCS; 5. Manage the database schema and make any modifications necessary to improve its performance or to accommodate any changes requested by the Joint Board; 6. Improve the performance of the server, database, table, index and queries, by tuning configurable parameters in the database.		
BO-088	The Toll System Provider shall provide an enterprise commercial reporting system (ERS) that shall allow the Joint Board or authorized agents, vendors or third parties to view, create or edit reports within the System with qualified and trained staff.	X	

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	Proposer Response: The TCS complies with requirement BO-088 in the following manner: The TCS uses the commercial package - Microsoft SQL Server Analysis Services (SSAS) as an enterprise commercial reporting system. This product will be available on a web-based platform for the Joint Board or other authorized representatives to access and utilize with minimal training. Users can easily create, view and edit reports using this software.		
BO-089	It is desired that the ERS be a Commercial Off-the-Shelf solution such as Business Objects (includes Crystal reports), Jaspersoft Microsoft SQL Server Reporting Services or Cognos. The Toll System Provider may propose other commercial tools subject to Joint Board approval.		X
	Proposer Response: The TCS complies with requirement BO-089 in the following manner: FastToll ERP includes commercial off-the-shelf enterprise reporting services software Microsoft SQL Server Integration Services (SSIS), Microsoft SQL Server Reporting Services (SSRS), Microsoft SQL Server Analysis Services (SSAS) and Microsoft Excel Power Pivot. Microsoft SQL Server Integration Services (SSIS) provides the ability to transfer information between data sources and transform the data as needed such as moving data from the roadside to the CSC databases. Microsoft SQL Server Reporting Services (SSRS) provides the ability to design, create and manage reporting from data sources such as the roadside and CSC databases. Microsoft SQL Server Analysis Services (SSAS) provides the ability to design, create and manage multidimensional structures that contain data aggregated from other data sources such as the data warehouse. MS Excel Power Pivot is another reporting tool that sorts, counts and sums the data from a spreadsheet, database, or other external data sources. The pivot table is a second table that displays the summarized data. The pivot tables are used to analyze long list of data without the use of formulas. The topics in this section provide an overview of the following components in Data Warehouse and Reporting module.		

Module	Tool	Description
CDC	SSIS	Data elements changes within Back Office and data stores are tracked to facilitate Back-up and Disaster Recovery.
Extract-Transform-Load (ETL)	SSIS	Extracts, transforms and loads data from the operational system into the data warehouse
Dimensional Data Store (DDS)	SSIS	Dimensional Data Store which houses operational data in various dimensions for use in data warehouse reporting.
OLAP Cubes	SSAS	Pre-aggregated data from Dimensional Data Store are stored as Cube for effective reporting and analysis. Cube pre-calculates all the measures and any calculations in advance and store effectively using the MOLAP storage technology.
Standard Reports	SSRS	The system provides a reporting engine with a web-client interface for pre-designed report layouts. These reports are delivered through a common web interface with access rights for each report.
Ad-hoc Reports	SSRS	Industry standard reporting tool to assist users to create reports based on user-provided selection criteria. Reports can be generated against transaction and summary level data.

An important benefit of the Sanef ITS Back Office is the use of Business Intelligence (BI) and Data Warehouse technologies for reporting and decision support. Business Intelligence is a framework for conversion of raw data into useful analytics. It bridges the gap between collected information and active analysis. It helps create useful business information from raw data in a very user-friendly manner. The use of Data Warehouse technologies protects the BOS Online Transaction Processing (OLTP) database from being adversely affected by processing loads caused by reporting access—it allows analysis and reporting to take place while new

Req ID	Back office (Section BO)	Required	Value Add
	transactions are being added to the database, without harming the performance of either activity. **Data Warehousing**: Sanef ITS uses Microsoft SQL Server data warehouse technologies for the BOS reporting infrastructure and decision support system (DSS). The technologies used include: • SQL Server Analysis Services (SSAS) for OLAP cubes; • SQL Server Integration Services (SSIS) for extraction, transformation, and loading (ETL) packages; • SQL Server Reporting Services (SSRS) for on demand, scheduled, and ad-hoc reports; and • SQL Server 2008 Change Data Capture (CDC) for updating data in the data warehouse based on notification of data changes in the source OLTP systems. **Business Intelligence:** For reporting, the Back Office uses Business Intelligence (BI) tools and technologies that include data warehousing, extract, transform, and load (ETL) packages, change data capture (CDC), and multidimensional database design. The reporting portal, called SQL Server Reporting Services (SSRS) provides off-the-shelf features for scheduling reports, delivery options, snap-shots, and ad hoc reporting. The underlying dimensional database store design supports ad hoc queries and reports for obtaining financial, traffic, and revenue data. The BI software tools include a suite of built-in financial, operational, and audit reports.		
BO-090	The Toll System Provider shall provide an existing suite of operational, financial, maintenance and other TCS reports as the basis for reporting. The reports shall be updated as required for the States' Parties.	X	
	Proposer Response: [redacted]		

Database Name	Type of Information
Roadside OLTP	Staging area for roadside equipment (RSE) messages (transactions and equipment status messages), first stage of validation, Vehicle Passage Records (VPRs) and Vehicle Summary Records (VSRs), Maintenance Online Management System (MOMS), Real-Time

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		Overview (RTO) for monitoring system health, Queues for Transaction Management		
	CSC OLTP	Primary data store to support account management functions, account holder information and contact details, roadside transactions (VPRs and VSRs), notes, correspondence, enquiries and complaints, double entry financial transactions, payments, tag inventory and management, database driven parameters,		
	Interoperability Hub	Supports interoperability agreements between agencies and exchange of: tag and plate validation lists; home on away facility transactions; away on home transactions; disputes, adjustments, corrections; image requests; acknowledgements reconciliation, and settlement. Also supports non-tolling applications such as airport parking, ferries, and other forms of transit.		
	Operational Data Store (ODS)	Near-real time collection of all operational data and consolidation of data from multiple sources. Schema is optimized to support reporting with date/time dimensions and cross-time attributes for historical tracking using slowly changing dimensions (SCD).		
	Dimensional Data Store (DDS)	Supports advanced analytics using multidimensional stores where quantitative entities that are used for analysis using MDX (Multi-dimensional expressions). Dimensional models divide data into measurements (fact tables) and descriptions (dimensions). The dimensional stores can be implemented in both relational databases, referred to as star schemas, and multidimensional databases, known as OLAP cubes.		
	Reporting Server	Supports maintenance of report definitions, schedule for running reports, and ad hoc report results.		
	Report Enforcement	Supports enforcement / violation reporting requirements.		
BO-091	The TCS shall have configuration management tools to manage Software and versioning in the TCS.		X	
	Note: The Proposer shall indicate in this Technical Response Form the name(s) and version(s) of the reporting tool(s) that the Proposer proposes to use for the Project. **Proposer Response:** The TCS complies with requirement BO-091 in the following manner: All software for the TCS is version controlled using Microsoft Team Foundation Server (TFS) 2012, a source code control tool for the .NET software development environment. The reporting tools are based upon Microsoft SQL Server 2012 Reporting Services (SSRS) and are: • SQL Server Reporting Services • SQL Server Analysis Services			
BO-092	The Toll System Provider shall provide training and access for the Joint Board to prepare its own user-designed, ad-hoc custom queries in addition to predetermined reports.		X	
	Proposer Response: The TCS complies with requirement BO-092 in the following manner: Sanef ITS shall provide documentation, training and access to the Joint Board and its representatives on how to use the MIS. The software covered in the training are: • TollCRM, - The Toll Customer Relationship Management application that consists of several modules to support toll road revenue management functions, and customer account management. • LiteCRM, - The LiteCRM application allows third party channels to manage customer accounts, vehicles, tags, payments and payment means. It is viewable in web browsers for desktops, laptop computers, tablets and smart phones. Remote CSRs can support toll road revenue management functions, and customer account management through Lite CRM. • Report builder - The report builder connected to various data sources. The data warehouse database is the main source of operation data for the reports. The report builder is based upon SQL Server 2012 Reporting Services (SSRS). • MOMS - Used for maintenance management and IT-help desk purpose: ○ Monitoring TCS alarms			

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	○ Handling work-orders (creating, scheduling, assignation to staff, notification via SMS or Email, closing the work-orders) ○ TCS inventory tracking The documentation for these instructions will be provided in user guides and training materials. Training on the use of the MIS will be for up to twenty (20) users per year, in up to four (4) separate courses. These will be held at locations to be agreed with the Joint Board.		
BO-093	The ERS shall be an integrated solution covering all report requirements for pre-determined, existing and ad-hoc reporting.	X	
	Proposer Response: [redacted]		
[redacted]094	The ERS shall provide central administrative control of user roles assignment in the System.	X	
	Proposer Response: The TCS complies with requirement BO-094 in the following manner: The FastToll ERP includes central administrative control for user role assignments. Operating System Domain logins and user groups are used as the centralized administrative control for all user roles in the TCS.		
BO-095	The ERS shall provide one of the following electronic report and screen formats: Adobe PDF, HTML, XML, RTF, and Microsoft Office 2010. Any of these products used must have compatibility.	X	
	Proposer Response: The TCS complies with requirement BO-095 in the following manner: Sanef ITS will implement Microsoft SSRS so that it provides for on-screen viewing and printing of both Adobe PDF and Excel formats. MS Excel can be used to transform Excel-formatted reports into any other formats listed here.		
BO-096	The ERS shall provide batch report processing that can run in the background concurrent with other applications. The ERS shall be in a separate layer from the BOS system that processes Transactions for the TCS.	X	
	Proposer Response: The TCS complies with requirement BO-096 in the following manner: The reporting capability of the Sanef TCS centers on the creation of an Operational Data Store (ODS), part of our data warehousing functionality: The data is first copied from the transactional system to a similar structured Operational Data Store (ODS) in a near-real time fashion for meeting the requirements for being in a separate layer from the transactional system. This approach provides an environment for staging the data without affecting the performance or retention policy of the transactional systems, and allows report processing to run in the		

Req ID	Back office (Section BO)	Required	Value Add
	background concurrent with other applications. The advantages of using an additional layer of data base between the transactional systems and the highly optimized Dimensional Data Store (DDS) are as follows: • ODS provides near real-time operational reports that are provided via standard management information reports and ad-hoc reporting; • ODS serves as the staging area for all complex transformation, cleaning and conforming of the data to the data warehouse; • ODS provides a staging area for the Extract – Transform – Load process to load data to highly optimized Dimensional Data Store (DDS) without even touching the transactional systems; • ODS can have a different retention period compared to the transactional system and databases within the data warehouse; • ODS has a similar structure of the transactional system for easy maintenance and enhancement; and • ODS acts as a source to validate the accuracy of data from the transactional systems. The database schema of the Operational Data Store is same as the transactional system with the following exceptions: • A separate dimension for Date; • A separate dimension for Time; • Additional Two columns for Date and Time key on certain tables for relevant dates like transaction date, account opening date, Invoice date, inventory date etc.		
BO-097	The ERS shall have a standard template for report formats and data formats that will be used for future report templates.	X	
	Proposer Response: [redacted]		

Req ID	Back office (Section BO)	Required	Value Add
	[redacted]		
BO-098	It is desired that the ERS have a user interface which is browser-based and compatible with the user interfaces used throughout the TCS.		X
	Proposer Response: The TCS complies with requirement BO-098 in the following manner: The Microsoft SSRS has a .NET browser based interface which is the base reporting tool for the Sanef TCS. This means that both the SSRS-based ERS and the Customer Website and TollCRM have similar GUI interface standards and approaches, giving the ERS the same look and feel as the rest of the TCS.		
BO-099	The ERS shall have the following capabilities and administrative functions: provide data by report columns, dashboard reporting, reporting calendar for scheduling pre-determined reports, graphical representation capabilities, drill down and sideways capabilities, reporting of data source capture points and the data relationship(s), sort data by report columns, filter tools for search and for reporting purposes, support for segmentation reporting based on excluded criteria, recordkeeping for each report created, which shall include, at a minimum, report owner, date created, date last edited, and a brief description of the report's purpose.	X	
	Note: The TSP shall indicate reports available in the system in its Technical Proposal Response Form. **Proposer Response:** [redacted]		

Req ID	Back office (Section BO)			Required	Value Add
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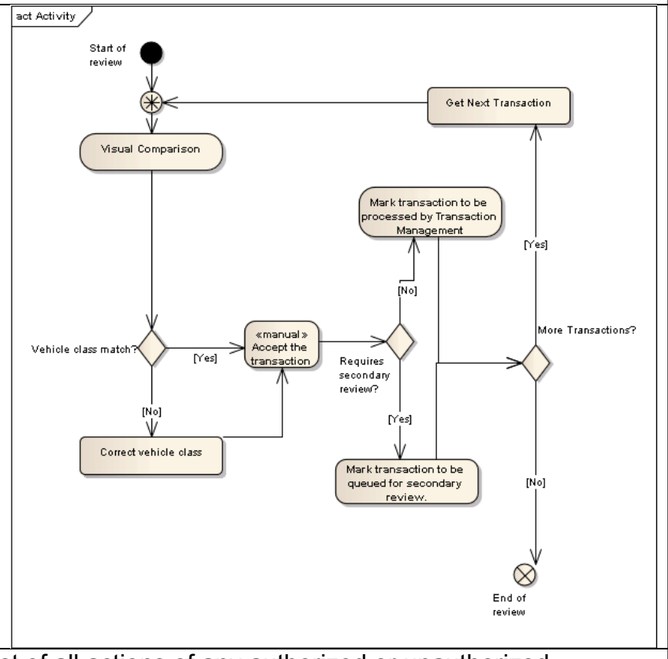
BO-100	The ERS shall allow authorized users to receive regular reports automatically. A user interface shall be provided for the user registration and registration edit functions, together with details of current registrations and report links currently available to the user.	X	
	Proposer Response: The TCS complies with requirement BO-100 in the following manner: FastToll ERP provides for automatic report distribution based on roles, groups, or users. It includes a user interface for user registration and registration editing, along with details of current registrations. Reports can be scheduled to run automatically with stored selection criteria, daily, weekly, monthly or any other frequency. The reports interface allows users to select the report to run from the reports list. Each report has its own data selection criteria. The default values of the selection criteria are configurable and will be finalized during the design phase of the contract.		
BO-101	It is desired that standardized control data shall be shown on all reports.		X
	Proposer Response: The TCS complies with requirement BO-101 in the following manner: Each standard TCS report will have standardized control data including the following: the report name, report ID, filter information, date range, title, column headings, page count, and data detail lines. Additional standardized data can be added at the Joint Board's request.		
BO-102	The ERS shall be configurable to include at least two logos provided by the Joint Board at any time and other facility information such as toll plaza name, facility, or lane numbers and location of the facility.	X	
	Proposer Response: The TCS complies with requirement BO-102 in the following manner: The **Sanef** TCS will maintain two Joint Board designated logos for use in the ERS in the TollAdmin module. The TCS will also store other facility information including terminology for reference to lane notation, toll plaza name, and facility identification information. This information is maintained in the TollAdmin module, the software module that houses the majority of configurable information within the system.		
BO-103	The TCS shall query data imported and exported to other systems when generating reports. The TCS shall allow for unrestricted and flexible reporting of any and all data. States' Parties shall have complete access to any data in the TCS database. The TCS reports shall be batch, ad hoc, standard, and non-standard.	X	
	Proposer Response: The TCS complies with requirement BO-103 in the following manner: The TCS SSRS permits the query of data imported from and exported to other systems. The TCS also supports the creation of batch (scheduled and on demand), standard and ad-hoc reports. The combination of data warehousing and SASS allows for unrestricted and flexible reporting of any and all data without affecting the performance of the other transactional areas of the TCS. The Joint Board and its authorized representatives will have complete read access to the TCS.		
BO-104	The Toll System Provider shall supply a reporting system that will utilize a query and run reports on the TCS. This reports system may be integrated into the TCS or can be an off- the-shelf system. The reports system shall provide reports for phases of Transactions and their movement through the TCS, and shall be capable of being queried using numerous methodologies. The reports system shall provide reports by ad hoc methodologies and through standard reports for Financial Transaction management, performance, and audits, The reports system shall be electronic; be compatible with Microsoft Office 2010 products; provide graphical representations of queries; save and query reports for future use; sort, add, edit or delete filters; and provide dashboards.	X	
	Proposer Response: The TCS complies with requirement BO-104 in the following manner: The Microsoft SSRS Report Manager allows querying and running reports on the TCS. It can report on any data in the system, including reports for phases of Transactions and their movement through the TCS, Financial Transaction Management, performance, and audits. It provides the following functionality: • View, search, print, and subscribe to reports; • Create, secure, and maintain the folder hierarchy to organize items on the server; • Save and query reports for future use • Sort, add, and delete filters.		

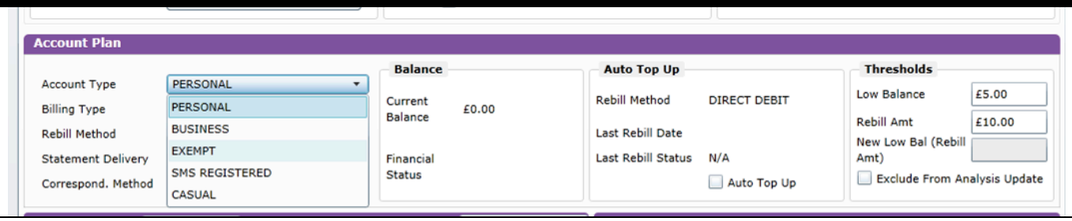
Req ID	Back office (Section BO)	Required	Value Add
	• Configure role-based security that determines access to items and operations; • Office 2010 compatibility; • Configure report execution properties, report history, and report parameters; • Create report models that connect to and retrieve data from a Microsoft SQL Server Analysis Services data source or from a SQL Server relational data source; • Set model item security to allow access to specific entities in the model, or map entities to predefined click through reports that you create in advance; • Create shared schedules and shared data sources to make schedules and data source connections more manageable; • Create data-driven subscriptions that roll out reports to a large recipient list; • Create graphical/visual data output representations (graphs and charts) of queries; • Provides management and other dashboards; • Create linked reports to reuse and repurpose an existing report in different ways; • Launch Report Builder to create ad hock reports that run on the report server.		
BO-105	The TCS shall provide graphical and spreadsheet reports for CSR activity, CSC activity, customer account activity, Transponder fulfillment activities, revenue reports, Transaction reports, financial reports, IVR reports, Violations reports, collections reports, Customer Website activity reporting, Walk-Up Center activity, customer contact reports, and general activity reports of the TCS system.	X	
	Proposer Response: The TCS complies with requirement BO-105 in the following manner: The TCS permits the exporting of all report data to Excel 2010. Reports include graphical representations of the report data (bar/column charts, line charts, pie charts, etc. as appropriate). These export and graphical capabilities are provided for all the items listed above, including CSR activity, CSC activity, customer account activity, transponder fulfillment activities, revenue reports, transaction reports, financial reports, IVR reports, violations reports, collections reports, customer website activity reporting, Walk-Up center activity, customer contact reports, and general activity reports of the TCS system and others.		
BO-106	The TCS shall provide functionality for offering promotions and promotional discounts that include but are not limited to: special pricing for certain customer groups, and prepaid trips on the Bridges. In the case of account holder promotions or discounts, the TCS shall be configured to discount the account on a transaction basis and also based on a configurable number of transactions posted to an account for a specific time period.	X	
	Proposer Response: The TCS complies with requirement BO-106 in the following manner: The Sanef Back Office supports a wide array of promotions and discounts. Discounts include residential discounts and fare reductions to particular groups, across account types (all or individual), and bridges (all or individual). Discounts can be applied at the transaction level, or for a set number of transactions over a time period. The management of the discount and promotions is done within the TollAdmin module of the TCS. The discounts and promotions will be applied to the TCS based on the Joint Board approved business rules. The following table provides a sample of how promotions are currently processed at existing Sanef ITS toll facilities, including Rhode Island, PMH1 in Vancouver Canada.		

Promotion Type	Description
One-Time Credit	A fixed, one-time non-refundable amount applied towards the customer's account balance. This type of promotion can be applied to both new and existing customers. An example of this promotion is a one-time $10.00 credit towards a new customer's account balance.
Toll Percentage (%) Discount	This promotion runs for a specified number of days and applies a fixed percentage discount to the toll transactions while posting to the account.
Toll Dollar ($) Discount	This promotion runs for a specified number of days and applies a predetermined monetary discount to the toll transactions while posting to the account.
Refundable Credit	A fixed, one-time refundable amount that can be deducted from the expected payment and applied to the customer's account balance. An

Req ID	Back office (Section BO)	Required	Value Add
	example of this promotion is a one-time $10.00 credit towards the account balance, where the customer may refund the unused credit if the account is closed before the credit is used. Refundable Credit promotions have their own financial code and are refundable. Other promotions are non-refundable. Fee Credit: This promotion type is used to apply credit on Account Fee incurred during a billing month.		
BO-107	The Toll System Provider shall have account functionality to designate that vehicles with approved Transponders or License Plates shall be charged a 100% discounted toll rate for trips made through the LSIORB Toll Zones.	X	
	Proposer Response: The TCS complies with requirement BO-107 in the following manner: The Sanef BOS will apply the stored toll rates and all associated discounts and promotions on all vehicles identified with a transponder and/or license plate. This permits the discounting of up to 100% of the toll amount for trips made on the LISORB toll zones.		
BO-108	The TCS shall identify, resolve, and manage exceptions based on defined data, parameters and Business Rules.	X	
	Proposer Response: The TCS complies with requirement BO-108 in the following manner: The TCS will function based on the Joint Board business rules. The TCS performs data validation checks that verify that these rules are carried out on transaction data, Financial data, and other data in the system. When the TCS detects that an event has occurred that conflicts with the business rules, it creates an exception. The TCS logs these exceptions and invokes automated procedures for resolving these exceptions. Automated procedures cannot resolve all exceptions--some exceptions will require manual intervention and resolution. For example, a transaction enters a class mismatch queue if the registered vehicle class differs from the vehicle class determined by the roadside equipment, a common exception that is shown in the diagram on the right. The TCS works to resolve the issue by checking the account and applying business rules to handle the exception. If the TCS is unable to resolve the issue automatically, the TCS sends the transaction to be processed by the image review clerks and be resolved manually.		
BO-109	Only authorized personnel of the TCS shall add, update or delete entries on the list of TCS exceptions. A list of all actions of any authorized or unauthorized personnel shall be logged into the TCS and available in exception reports.	X	
	Proposer Response: The TCS complies with requirement BO-109 in the following manner: The **Sanef** Back Office only permits that authorized users have access to the TCS list of exceptions. There are no unauthorized users with access to the TCS. Based on user roles, some personnel may be limited from creating some types of exceptions. The TCS logs the creation, modification and deletion of any entries to the exceptions. A report will be provided listing all the exceptions in the system and any changes made.		



Req ID	Back office (Section BO)	Required	Value Add
BO-110	The TCS shall have the configurable capability to handle exceptions by correcting the exception, charging the customer (including merging of Traffic Transactions), or by coding them off. These actions shall be based on the approved Business Rules.	X	
	Proposer Response: The TCS complies with requirement BO-110 in the following manner: The **Sanef** Back Office analyzes exceptions such as orphan transactions (transaction containing only a transponder read), vehicle splits (two transactions containing partial information for the same vehicle such as one transaction containing only the transponder read and the other transaction containing the classification and license plate information), and incorrect vehicles (transaction that has the wrong transponder assigned to it) and has built in algorithms intended to resolve (correct) these (including merging traffic transactions where appropriate) and post them to the appropriate account or create violations accounts, thereby charging the customer. Those exceptions that cannot be resolved within the parameters of the algorithms are processed via a manual review queue. Manually reviewed exceptions can then be resolved or coded-off by the person reviewing the exception (business rules may require secondary review for codding off revenue transactions). The algorithms for automated process as well as the reason codes for manual write-off will be finalized once the business rules have been approved by the Joint Board.		
BO-111	The TCS shall retain an audit trail of the occurrence of each exception including the time and date, type of exception, triggering event and resolution.	X	
	Proposer Response: The TCS complies with requirement BO-111 in the following manner: The **Sanef** Back Office maintains a complete audit trail for all exceptions, including: date, time type, location, conditions, triggering event, and resolution. This information is then analyzed in the exceptions reports to identify what were the root causes of the exceptions and if any action can be taken to prevent or reduce future exceptions. This analysis is especially important if some exceptions are appearing with unexpected or unusual frequency.		
BO-112	The TCS shall set configurable Business Rules and thresholds for the purpose of managing exceptions and transaction processing as directed by and subject to the approval of the Joint Board.	X	
	Proposer Response: The TCS complies with requirement BO-112 in the following manner: The **Sanef** Back Office algorithms will be based on the approved business rules and used to resolve and process exceptions in the TCS. Exception thresholds related to event frequency (including count & time parameters) are configurable and are used to identify chronic conditions, system, equipment failures or other anomalous conditions that may need to be resolved. The thresholds for the identification of the exceptions and the conditions for their resolution will be subject to the approval of the Joint Board and included in the approved business rules. These thresholds may need to be modified after the system goes live. We will discuss procedures for modifying the thresholds with the Joint Board during the business rules discussion.		
BO-113	The TCS shall ensure that only authorized non-revenue Transponders are charged zero dollars for tolls. The TCS shall maintain a Project specific non-revenue account list for the Project.	X	
	Note: For example, Traffic Transactions initiated by drivers holding Transponders that are designated as non-revenue Transponders from an account established with another E-ZPass agency shall not be treated as non-revenue Traffic Transactions in the TCS. **Proposer Response:** The TCS complies with requirement BO-113 in the following manner. The **Sanef** Back Office has an “Exempt” account type that enables certain accounts to be considered “non-revenue”. These accounts receive Transponders and participate in all other account activities with the exception of payment and billing (although payment and billing could also be active if these exempt tags are used at other E-ZPass facilities, for which the tolls will be owed even by LSIORB exempt accounts, if the Joint Board wants to make exempt E-ZPass accounts). The following screen shows the Account type of Exempt selection. In general, the exempt account type is only valid at the home facility (LISORB)—we would not treat an exempt transponder from another E-ZPass facility as exempt at LSIORB bridges. We will work with the Joint Board will in business rule development to define comprehensive rules for how non-revenue transponders are treated.		

Req ID	Back office (Section BO)	Required	Value Add
			
BO-114	The TCS shall retain records of non-revenue travel and the associated vehicle or Transponder number.	X	
	Proposer Response: The TCS complies with requirement BO-114 in the following manner: All travel and related information about non-revenue accounts are maintained at the same level as revenue accounts. All features and functions are available, except those related to the payment process, which because of the exempt status does not apply (although as noted above, non-revenue E-ZPasses could still be used at other E-ZPass facilities, in which case they would also have tolls to pay, pending business rules decisions by the Joint Board).		
BO-115	The TCS and the Toll System Provider operations shall prevent customers from being erroneously charged (overcharged, double charged or undercharged).	X	
	Proposer Response: The TCS complies with requirement BO-115 in the following manner: The Sanef Back Office has internal sanity checking rules that are applied to each transaction before it is posted to an account to prevent customers from being charged incorrectly, including checks to identify overcharges, duplicate charges, or undercharges. Transactions cannot be charged twice to an account because of its status as a primary key, and referential integrity rules in the database will not allow this to occur. Time constraints are also placed so that within a period of time (configurable) more than one transaction cannot post to the same account. Transactions that have miss-classes (AVC and TAG classes do not match) are manually reviewed and resolved prior to posting to an account.		
BO-116	The Toll System Provider shall provide a lockbox service that is integrated into the TCS and that updates account records in the System when payments are recorded in the System.	X	
	Proposer Response: The TCS complies with requirement BO-116 in the following manner: Sanef can perform all lockbox services internally or contract with an external lockbox operator and provide access. Whoever performs lockbox operations would receive all mail correspondence and perform functions remotely. Lockbox maintenance activities include scanning all correspondence documents into the system and attaching them to accounts, receiving all payments, scanning checks, money orders and credit/debit card payment authorization forms and attaching them to accounts as well as depositing these funds to the designated financial institution. If employed, a third-party service provider will be connected to the TCS via a secure and encrypted dedicated connection. Using such a third-party service will permit that all data is entered in real-time and immediately available to Sanef ITS CSRs; thus no operational delay should a third-party service be used instead of Sanef performing the service itself.		
BO-117	The TCS shall perform automated look-ups for customer name and address acquisition and check them against DMV records through interfaces with services provided by the Toll System Provider. The Toll System Provider shall coordinate access with the Joint Board and integrate directly through the Kentucky and Indiana DMV.	X	
	Proposer Response: The TCS complies with requirement BO-117 in the following manner: FastToll ERP has secure external interface connections with DMVs, third-party skip trace data vendors, and the USPS to automatically get address information from a variety of sources. All external lookups are automated processes that return either hits or rejects. For this project the TCS will be integrated with both the Kentucky and Indiana DMV for license plate and registered owner information collection. We will coordinate this access through the Joint Board.		
BO-118	The TCS shall communicate court evidence packages with the courts through the following interfaces: Web Portal, Paper, FTP, USB drive, and CD-ROM.	X	
	Proposer Response: The TCS complies with requirement BO-118 in the following manner: When a customer account is overdue and the attempts to collect a payment have failed, the toll operator has the option to forward the case to a prosecution or collection agency. This procedure is fully integrated in the FastToll ERP system and will trigger the creation of an “evidence pack” that will contain the evidence of toll passages (vehicle pictures, invoices, etc.) and of the non-payment of		

Req ID	Back office (Section BO)	Required	Value Add
	these charges. The content of an evidence pack and the exchange protocol to send it can easily be adapted to the requirements of the local prosecution agency. This “base” Appeal evidence pack shall include items from the toll transaction and subsequent activities. The pack shall be based upon one of a number of possible pre-defined Appeal evidence pack templates. Elements that may be included in an Appeal evidence pack include case summaries, copies of incoming/outgoing correspondence, copies of notices, contact summaries, the Notice of Rejection of Representation, the images associated with the notices, associated addresses/keeper and their provenance as well as items available from other available sources such as maps, legislation etc. We will discuss contents of the evidence pack with the Joint Board during Business Rule discussions. Evidence pack contents may vary by state, and if necessary even by court system. The following diagram depicts the creation process of the evidence pack: [redacted] The CSR reviews the pack and, shall have the ability to simultaneously edit section headers, add or remove items or whole sections, edit the covering letter. The pack may be saved at any point during review/edit and returned to at a later time if required. The CSR subsequently issues the evidence pack to the Adjudication Service or prosecution agency using the appropriate method (Web Portal, Paper, FTP, USB Drive, and CD-ROM). The Appeal evidence pack is attributed to and saved against, the relevant account and related toll transactions. A copy of the Evidence Pack, with covering letter, printed out and posted to the customer or other legal representative.		
BO-119	The Toll System Provider shall provide all necessary mailing services for customer invoices and Correspondence services. The Toll System Provider shall ensure that all Customer Statements mailed to the customer are stored in the TCS and available to the customer service representatives. Postage will be reimbursed to the TSP as a Pass-Through Cost Item.	X	

Req ID	Back office (Section BO)	Required	Value Add
	Proposer Response: The TCS complies with requirement BO-119 in the following manner: The **Sanef ITS** Back Office also provides interface to an external Printing House, that will manage the printing and delivery of correspondence letters, such as the Welcome letter, Credit Card Expiration letter, Account Closure letters and Customer Statements. The correspondence data can be sent to the printing house either as “ready to print” files (like PDF) or as raw XML data that will then be formatted using customized style sheets. A copy of all the documents sent to the printing house will be archived at the CSC in the TCS database and available to the CSR’s. All printing house charges will be passed through to the Joint Board without markup by Sanef. The diagram provides an overview of the Print House Interface: [redacted]		
BO-120	The Toll System Provider shall manage Hardware, Software and equipment life cycles to ensure equipment is replaced prior to “end-of-life cycle” or at such earlier time when the manufacturer no longer provides support for the components.	X	
	Proposer Response: The TCS complies with requirement BO-120 in the following manner: **Sanef** has a maintenance program that is executed through its MOMS system that manages equipment, maintenance and replacement cycles. The MOMS will also be used to inventory the software and licenses to ensure that during the contract period both equipment and software are replaced prior to end of life. The third party software being delivered with the project has expected lifecycles greater than 10 years.		
BO-121	The Toll System Provider shall use field-proven Hardware, Software and equipment configurations that have been deployed on toll projects of similar or larger size and complexity, and that support future upgrades to processors, memory, storage, operating system, database and other System components.	X	

Req ID	Back office (Section BO)	Required	Value Add
	Proposer Response: The TCS complies with requirement BO-121 in the following manner: FastToll ERP, FastFlow and FastHost have all been successfully used on other projects of similar or greater size and scope, including PMH1 in Vancouver Canada, at the Rhode Island Bridge and Tunnel Authority, at the M50 in Dublin, and at the Dartford/London UK bridge project. For every project, the latest versions of third-party software and development tools are used. All hardware is purchased from major vendors to ensure availability. Equipment such as servers, switches, printers and others are sized to meet the growth and lifecycle requirements of the project, including allowing future upgrades to processors, memory, storage, operating system, database and other System components. Both the hardware and software versions are detailed in the Bill Of Materials (BOM).		
BO-122	The Toll System Provider shall provide an interface from the TCS to the Kentucky DMV and the Indiana DMV. The TCS shall provide an automated license plate file transfer interface to the Indiana DMV and the Kentucky DMV for look-up and return information for the registered owner. The methodology used to achieve this interface shall be at the discretion of the Toll System Provider. The TCS shall track all files transferred to each DMV with which it interfaces and track how many files were transferred successfully resulting in a license plate return and address, and also how many requests were returned unsuccessfully.	X	
	Note: The Kentucky and Indiana DMV support automated look-ups for outside organizations that successfully apply. Both Indiana and Kentucky allow multiple owners to be associated with a single vehicle and license plates stay with the prior owner when a vehicle is sold or otherwise transferred. **Proposer Response:** The TCS complies with requirement BO-122 in the following manner: The TCS will be fully integrated with the Kentucky and Indiana DMVs for the purpose of automatically sending license plate data information request files and automatically receiving the current registered owner contact information and other data. This exchange can be through Secure FTP or secure web services or other data interface as specified by the DMVs respectively. During the design phase we will work with both DMVs to provide the appropriate documentation to request and receive DMV data on the behalf of the Joint Board. The TCS tracks all files transferred to each DMV, and has built-in sanity checking algorithms to identify corruption and data loss through external service provider connections. The TCS also tracks the success rate for DMV lookups.		
BO-123	The Toll System Provider shall provide a TCS that includes Transponder inventory and fulfillment application services. The TCS Transponder inventory and fulfillment services shall include Transponder purchasing, distribution, tracking, warranty data, returns to manufacturer, and reporting interfaced with the INDOT procurement process. The TCS shall import Transponder manifest lists from common file formats to be used in the TCS without additional manipulation. The TCS shall include bar code processing which results in automatic entry of Transponder identification numbers into the TCS. The TCS shall track the full life cycle of a Transponder from the time it is purchased through allocation to each of the centers for distribution, through the fulfillment process and finally through the end life of the Transponder when it is removed from inventory. The TCS shall provide a report of the total number of Transponders, the locations of those Transponders, where the Transponders are in the distribution process, the customer account to which they have been assigned, shipping information, and information for final delivery to the customer. The inventory process shall account for the locations (both physical and within the distribution process) of all Transponders during their life cycle. The TCS shall produce reports that detail the number of Transponders distributed, the number of Transponders requested to date, the number of Transponders fulfilled, the number of Transponders shipped, and the number of requests in progress. The TCS shall track and provide reporting for warranty information on the Transponders, returns to the manufacturer warranty expiration dates, and number of Transponders in inventory.	X	

Req ID	Back office (Section BO)		Required	Value Add
	Proposer Response: The TCS complies with requirement BO-123 in the following manner: The Transponder Management application is a component of **the Sanef ITS** Back Office to track transponder inventory, fulfill transponder orders and distribute transponders, and manage transponder status. This application also provides the ability to track receipts of transponders (and individual transponders) to specific purchase orders. Transponders received from the supplier or returned from the customer will be tested to identify defective transponders prior to assignment to a customer. All transponders found to be defective, whether received from the transponder supplier or a customer, are returned to the manufacturer. The Transponder Management application uses bar codes on the transponders to track the transponders through their entire lifecycle, and also manages purchasing, distribution, warranty data, and manufacturer returns. When a shipment is received from the supplier, the Transponder Management application imports the shipment manifest directly, without manipulation. Transponder ID numbers are entered automatically from the bar code on the transponder. Throughout the transponder lifecycle, the Transponder Management application tracks and provides reporting for warranty information on the Transponders, returns to the manufacturer warranty expiration dates, and number of Transponders in inventory. The transponder Management application provides features to perform all of the functions described in the functional overview diagram at right. The Transponder Inventory clerks will receive inventory and manage the stock of transponders using bin management feature that allows tracking transponders to their physical shelf location. The inventory status is set to “Assigned” when shipped to the customer. The following table provides transponder inventory statuses after being received by the CSC and entered into the database.	[redacted]		

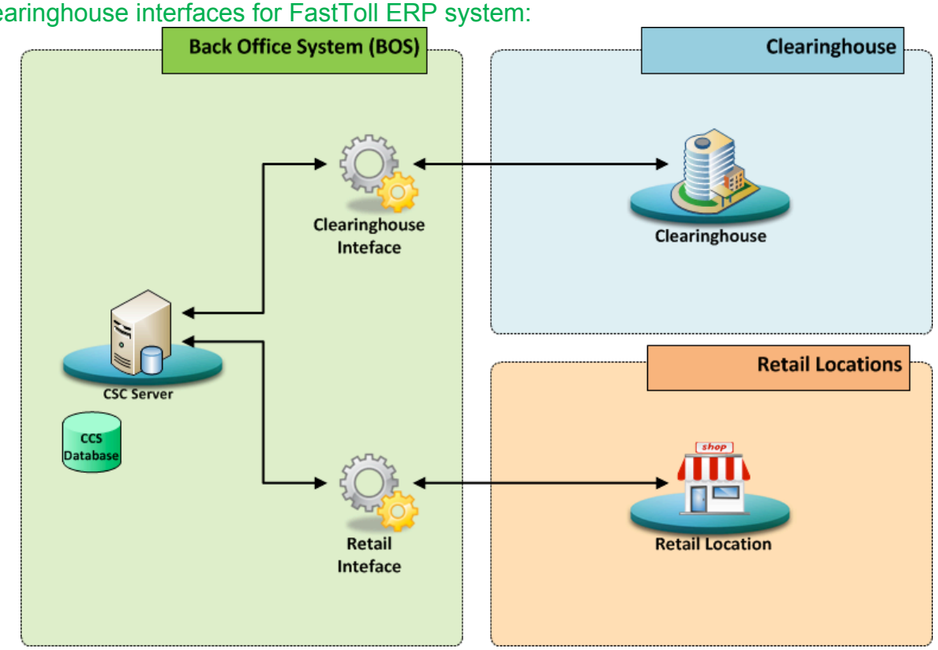
Req ID	Back office (Section BO)	Required	Value Add
	[redacted]		
	[redacted]Pending activation" is used for the time between shipment of the transponder and customer-initiated activation. The transponder cannot be used until customer		

Req ID	Back office (Section BO)	Required	Value Add
	[redacted]		
	[redacted]		
	[redacted]		
	[redacted]		
	[redacted]		

Req ID	Back office (Section BO)		Required	Value Add
	[redacted]	[redacted]		

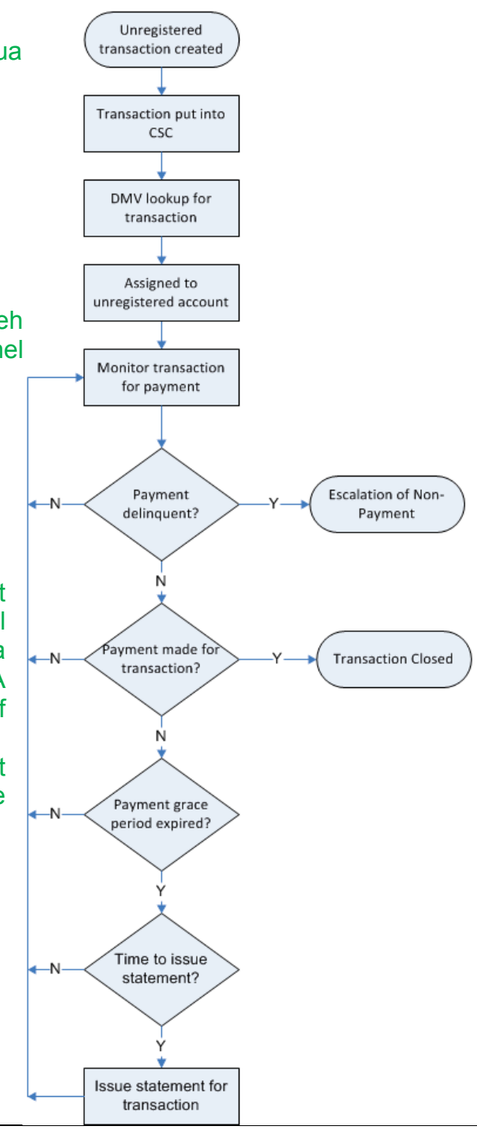
Req ID	Back office (Section BO)	Required	Value Add
BO-124	The Toll System Provider shall fully audit and reconcile Traffic Transactions throughout the life of the Traffic Transaction. The TCS shall provide for the ability to fully reconcile the flow of Traffic Transactions throughout the system to each end state of the Traffic Transactions from receipt of roadside activity through the TCS, through its final disposition. The TCS shall be fully auditable and provide transponders reconciliation processes for customer service representative transactions, ETC Transactions, video Transactions, account balances, front counter and call center activity, adjustments, credit card Transactions, and payments. The methodology used for this reconciliation process shall be at the discretion of the Toll System Provider but shall provide auditable insight into each component of the TCS and into each step of the Transaction. The Toll System Provider shall have an auditable system to track all payments and any Financial Transactions as well. The TCS shall be required to reconcile Traffic Transactions with payment collections. Reports shall be generated for auditable and logical Transaction and payment reconciliation.	X	
	Note: The Toll System Provider shall provide in this Technical Response Form a Traffic Transaction flow and Financial Transaction flow that allows the Joint Board to conduct traffic and revenue audits from the roadside through the account management system including interoperability partners and external third parties, and also the same in the reverse direction. An audit trail shall be provided by the Toll System Provider to demonstrate the flow and disposition of all Transactions. **Proposer Response:** [redacted]		

Req ID	Back office (Section BO)	Required	Value Add
	[redacted]		
BO-125	The Toll System Provider shall provide a TCS that includes a retail distribution network for Transponders, Transponder reloading, account replenishment, and toll payment services such as would occur at local grocers, pharmacies, etc. The TCS shall support at least one type of such service such as kiosks, interaction with store clerks, or use of gift card type packages.	X	
	Note: Proposer shall specify the type or types of retail distribution networks to be provided with the TCS. **Proposer Response:** The TCS complies with requirement BO-125 in the following manner. **Sanef ITS** has, in other projects, delivered transponders through retail programs using prepackaged tag kits. Transponders are packaged for retail distribution with instructions and any additional mounting supplies. Retailers sell the transponders to customers who activate the transponder via telephone, IVR or internet, and in activating the transponder they create a temporary anonymous account. After the customer uses the transponder at the roadside, they can then register their transponder to an account with some form of payment to replenish the account. FastToll ERP maintains detailed records of retail inventory and manages retail restocking separately from CSC inventory. This retail inventory has its own purchase order, invoicing and replenishment rules based on retailer sales history and restocking times. Retail locations support not only tag sales, but also transponder reloading, account replenishment, and other toll payment services. At this time, Sanef ITS does not have a retail distribution network in the US, but is in the process of negotiating with several retail point-of-sale distributors that handle similar products on a national level. These parties have the ability to quickly add tag kits to the current product they distribute to retailers**. Sanef** has previously provided kiosks for account payment for both video and transponder based transactions. Sanef ITS intends to modify this kiosk technology to distribute transponders and tag kits.		
BO-126	The TCS shall have functions to support a cash-replenishment network to provide cash based replenishments in retail locations and shall describe the customer experience for the cash replenishment network in the System Documentation. The BOS Operations Plan shall identify any differences in Business Rules to be applied at the retail locations.	X	
	Note: The Proposer shall describe in this Technical Response Form the customer experience for the cash replenishment network. **Proposer Response:** The TCS complies with requirement BO-126 in the following manner. Sanef has significant experience providing cash replenishment at retail locations, which give the un-banked portion of the population a means to replenishing video or tag based accounts and to pay violations when necessary. The experience for the users of the system was positive in that it gave them the ability to pay with cash without having to go to the walk-up centers to make payments. In general, the user experience was that users would go to a retail location, purchase a toll replenishment card with cash, call the toll free number for the CSC, and use an option on the IVR to associate the cash amount on the card with their account. We will provide customer experience survey results along with our system documentation to assist the Joint Board in determining how they would see this payment channel being used in the context of this project—what aspects we should tweak, and what aspects should be kept as they are. We will also identify our business rules for retail locations in the operations plan, so the Joint Board may provide their input on those business rules.		
BO-127	The Toll System Provider shall provide financial and operations reporting for the cash based replenishments network.	X	
	Note: The Toll System Provider shall describe the interface with the cash replenishment network-provide and the operations and financial reporting for the interface in the System Documentation.		

Req ID	Back office (Section BO)	Required	Value Add
	Proposer Response: The TCS complies with requirement BO-127 in the following manner. FastToll ERP treats payments received through the retail/replenishment network like those received from any other payment gateway provider, except that FastToll ERP provides the ability to identify the specific retail location from where the payment was made for any transaction. This feature is useful to determine if additional locations are desirable in a specific area. The FastToll ERP provides real-time payment processing for retail locations through the retail and clearinghouse interfaces. When a payment is made at retail location, the payment is received by the FastToll ERP. the FastToll ERP then clears the payment with the clearinghouse and then responses back to the retail location with the payment. Below is a diagram of the showing the retail and clearinghouse interfaces for FastToll ERP system:  The data transmitted between the two locations is via encrypted SSL. The first step in the transaction is that the gateway provides account identification information. This would, for example, be an account number and pin, or a violation notice number and a license plate. The FastToll ERP would respond with an acknowledgement such as violation date or account holder name and an amount due or replenishment amount. The retailer then collects funds from the customer and enters into the system the amount received. This money is then transferred to the CSC account by the clearinghouse operator in real time, and the CSC credits this to the appropriate account. All these transaction details are recorded in a GAAP-compliant way within the financial module of the TCS. All retail transactions are reflected in the appropriate revenue reports and identified as retail transactions.		
BO-128	It is desired that the cash-replenishment network provide functionality for customers to purchase transponders, pay invoices or Violations and support balance inquiries on customer accounts.		X
	Note: The Proposer shall describe in this Technical Response Form the customer experience for the cash replenishment network. **Proposer Response**: The TCS complies with requirement BO-128 in the following manner: The cash-replenishment network will provide customers options to purchase transponders, pay invoices or violations and support balance inquiries. The cash replenishment network includes retail locations and kiosks. Walk-up centers also accept cash, but these are direct parts of the TCS and thus not part of the cash replenishment network for the purpose of this requirement. At retail locations transponders are obtained by over the counter or by a kiosk inside or in the vicinity of the retail location. When a transponder is purchased at a retail location, it comes in a kit, which includes the transponder, mounting materials, account application & transponder registration form and instructions. The price charged		

Req ID	Back office (Section BO)	Required	Value Add
	for the transponder kit includes the deposit and a prepaid toll passage amount. The transponder can be paid for at the retail location using credit card, check, cash, and money order. Once a customer obtains a tag, he/she needs to register the transponder by opening a transponder account with the authority. After the tag is obtained at retail location, the customer needs to contact the authority to open an account and register the tag with the account. The customer can open the account 1) online, thru the authority's website 2) by phone, calling the CSC 3) in person, at the CSC walk-in center or 4) by mailing an application to the authority; the application can also be dropped in person at the CSC walk-in center. Accounts can be replenished using credit card, check, cash, or money order at the retail location. Customers can also pay invoices or violations at a retail location. For these services, the customer experience is as follows: In general, the user experience was that users would go to a retail location, purchase a toll replenishment card with cash, call the toll free number for the CSC, and use an option on the IVR to associate the cash amount on the card with their account. We can also provide functionality to support balance inquiries at retail locations, but we have not included this feature in the current price of the proposal.		
BO-129	It is desired the Toll System Provider provide functionality to allow customers without an account to pay for tolls prior to the issuance of a Customer Statement.		X

Req ID	Back office (Section BO)	Required	Value Add

	Proposer Response:
	The TCS complies with requirement BO-129 in the following manner:
	
	The TCS provides multiple payment channels that allow customers without an account to pay for tolls prior to an issua methods include:
	• Internet;
	• Telephone;
	  ○ CSR;
	  ○ IVR.
	• Mobile application;
	• Walk-in;
	• Retail.
	All these methods provide unregistered customers the means to enter there their license plate information, veh the toll facility and pay the toll amount. The motorist provides information CSC through one of the provided channel CSC channel will provide the amount due and payment options. The payments options can be:
	• Credit / debit card;
	• Wire Transfer;
	• Check;
	• PayPal (online only);
	• Cash (walk-in/retail only);
	• Money order (walk-in/retail only).
	Payment in the form of credit card, debit card or other electronic form can be processed immediately by the motorist information to make the payment. For conventional payment such as by check, cash or money order, the motorist will provided directions on how to make these payments. If payment for a transaction is made before the issuance of a statement for the transaction, then a statement will not be issued for the transaction and the transaction is closed. A confirmation of payment for the transaction itself is never sent, this is a policy issue to protect the privacy of users of
	
	The system records the credit for a toll that is associated with a license plate. This credit is applied to the first the system for that license plate where there is no other valid form of payment. This process is managed by the FastToll ERP, and can be modified after the business rules meeting to better reflect the policies of the Joint Board.
	
	Statement Issuance for Unregistered Transactions
	 		

BO-130	The Toll System Provider is responsible for DMV lookup for all other States and Provinces. The TCS shall track all files transferred to each DMV with which it	X	

Req ID	Back office (Section BO)	Required	Value Add
	interfaces and track how many files were transferred successfully resulting in a license plate return and address, and also how many requests were returned unsuccessfully. The Toll System Provider shall also interface with NIets through an existing INDOT agreement if existing access to NIets is not included in the Proposer's response. Proposer will be required to establish and maintain all required certifications to utilize the NIets interface regardless of which access is incorporated into the proposal.		
	Note: The Proposer shall describe its existing out of KY or IN State and Province lookup process in its Technical Response Form. The Proposer may use an existing NIets interface if already available and functional within the Proposer's system. **Proposer Response:** [redacted]		

Req ID	Back office (Section BO)	Required	Value Add
	[redacted]		

Customer Service Center Requirements

Req ID	Customer Service Center (Section CS)	Required	Value Add
CS-001	The Toll System Provider shall supply appropriate staffing for a fully functional and operational CSC to support tolling operations of the Project. These services shall include, but are not limited to, 1) account management and maintenance services, 2) Customer Website services, 3) mailroom operations, 4) customer communications through phone, email and or text, 5) interoperability and reciprocity, 6) internal or external financial and lockbox operations, 7) ETC and image review processing, 8) Transponder inventory and fulfillment, 9) Violation processing, 10) internal or external administrative and court collections processing, 11) Walk-up Center operations, 12) quality assurance and quality control, 13) training, 14) management, oversight and personnel services, 15) reporting, 16) security of information, and 17) equipment in order to successfully collect toll revenue for toll customers. The Joint Board shall have no responsibility for increases or decreases in actual levels of equipment, but the Joint Board will pay for some limited services and facilities using Pass-Through Cost Items as defined in the Contract.	X	
	Proposer Response: [redacted]		

Req ID	Customer Service Center (Section CS)	Required	Value Add
	[redacted]		

Req ID	Customer Service Center (Section CS)	Required	Value Add
[redacted]	[redacted]		

Req ID	Customer Service Center (Section CS)	Required	Value Add
	[redacted]		
CS-002	The CSC shall be staffed with personnel that are experienced and knowledgeable in toll industry practices, and the Toll System Provider shall provide trained, competent and courteous customer service staff to assist individuals and businesses in managing their toll accounts. The CSC shall provide all services required to enable customers to pay tolls by use of a Transponder or image capture of their license plate or through the Violations and collections process; including accounts from interoperable toll agencies, and the resolution and payment of toll bills, notices and collection of civil penalties for unpaid tolls.	X	
	Proposer Response: The TCS complies with requirement CS-002 concerning (1) Personnel, and (2) Service Provision. **(1) Personnel**		

Req ID	Customer Service Center (Section CS)	Required	Value Add
	For this first part of the requirement on personnel/staffing, our TCS complies in the following way: Sanef provides highly qualified staff through thorough recruitment and training programs focusing on both leveraging on Sanef's internationally recognized experience and staff as well as recruiting and training, providing local opportunity at all levels of responsibility with the goal of eventually having all key staff, being locally recruited and trained as part of our United States' tolling operations center of excellence with opportunities for career advancement. We value our people as they form the backbone of our tolling operations, and therefore, a major factor of success. All higher-responsibility positions are initially staffed internally—to the extent possible—through existing Sanef employees, who have demonstrated their abilities to manage various aspects of CSC operations. ***Recruitment*** We define detailed job specifications for all CSC roles and corresponding staff involved to ensure key skill sets are appropriately identified and recruited—whether from Sanef's existing internal staff for senior positions or for lower to intermediate staff recruited locally/nationally. Sanef's standard CSC job specifications identify the following: • Desired levels of education, training, experience, and other qualifications. • Personality attributes, including courtesy, professionalism, and rigorous punctuality. • Key Result Areas – to enable on-going staff performance management and career development. Sanef will work with a local recruiting agency to identify and recruit appropriate staff in a timely way, so they are ready to participate in the CSC start up before tolling operations begin. Sanef will follow a robust process for recruitment and selection, as follows: • Telephone Interview – appropriate candidates are initially vetted for suitability through a telephone interview. This allows for identification of key skills and ability to communicate over the telephone. Sanef will also implement adequate skills test to assess candidates' abilities in soft skills and using IT systems. • Assessment Centre – depending on the role, assessment centers are used to assess other skills and capabilities, such as problem solving and teamwork. • Interview – on-on-one interviews will be held between the candidate and Sanef for final selection. ***Background Checking and Vetting*** Sanef will commence the following baseline recruitment background checks and vetting on successful completion of the interview stage including: • Proof of Identification – original driver's license, passports or state-issued identity cards for verification purposes. • Right to work – the candidate will be asked to produce evidence of right to work in the United States • Work references. • Background check – criminal records and credit score. ***Training*** Because we value our people, training carries much importance. Every staff member goes through purposeful, scheduled, and structured training throughout their employment with the company. Training in our organization will be an ongoing initiative, as we want to remain effectively capable in meeting the Joint Board's service requirements. Our Training Plan will therefore comprise the following basic structure: A. Orientation and Health and Safety B. Tolling Introduction C. Technical Training (content specific to each job or function) D. Key Performance Indicators requirements E. Personal Performance Indicators requirements F. Specialized Training (policy decisions, business rules, process improvements) (as needed) G. Special Needs Training (as needed) H. Refresher Training (as needed).		

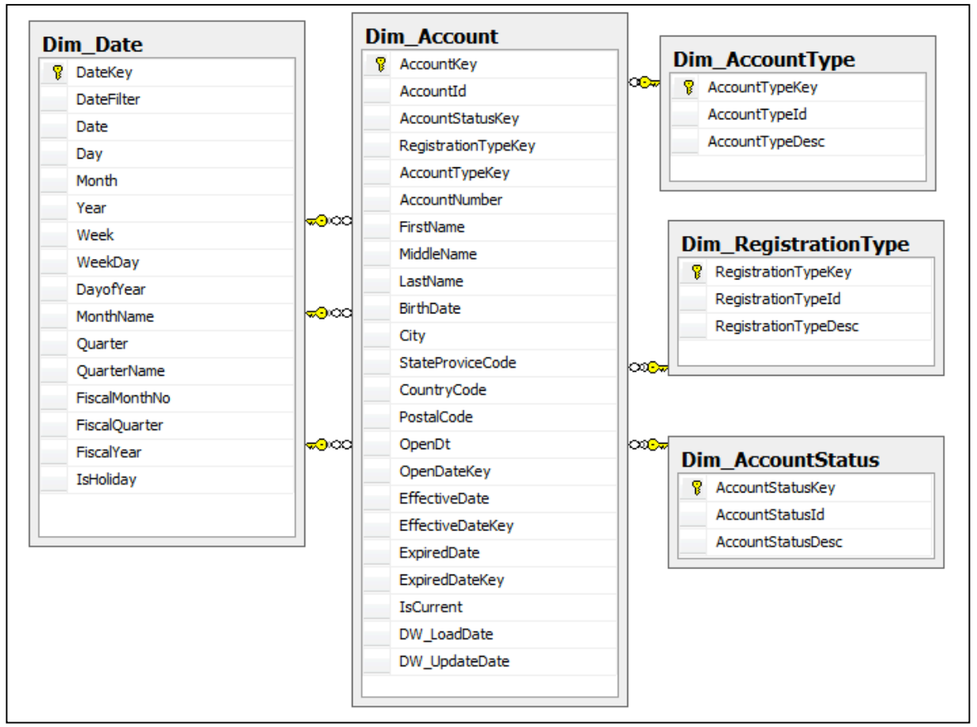
Req ID	Customer Service Center (Section CS)	Required	Value Add
	Technical training consists of the Toll Operations Agreement, Operations Manuals, Policies and Procedures, and tolling system application modules, and will be conducted by the area manager or the technical team. This training is delivered in groups or by computer-assisted modules as most effective or appropriate to the curriculum. In addition, Information training will be constituted by in-house publications distributed monthly to the employees. It provides an opportunity to obtain and be briefed on specific information concerning tolling components, quality management, and financials of the project. Our Training Plan will cover initial training all the way to refresher training as we need to sustain the level of knowledge and job competence of our staff members to ensure that they are always equipped and capable of meeting their personal performance indicators and supporting their department's attainment of its specific objectives and targets. To monitor and measure the extent of progress and performance by staff members who underwent various training programs, we will employ tailored testing programs and tools. In addition, monthly quizzes will be organized for all staff, on a variety of topics from finance to customer service, quality and IT, and Business Intelligence. The corresponding results will be a component of the scorecard of any staff member that will be used to report his/her actual performance versus his/her personal performance indicator targets. Further details of training are presented below in CS-062. **(2) Service Provision** ***For the second part of the requirement*** (provide all services required to enable customers to pay tolls by use of a Transponder or image capture of their license plate or through the Violations and collections process; including accounts from interoperable toll agencies, and the resolution and payment of toll bills, notices and collection of civil penalties for unpaid tolls), the TCS complies in the following way: The CSC shall support payment of tolls, violations, and civil penalties through payment channels specific by the CSC: walk-up center, retail, IVR/phone with CSR, mail, and web. Web and phone payments will only accept credit/debit cards or direct debit payments but can be further extended to support fleet-cards. In addition to these payment channels on the Web, the Walk-up centers and retail outlets will also accept cash and check. Mail payments will be possible by check and credit card if required. All channels will be properly equipped to handle these payments. All channels will be equipped with payment card processing equipment. Walk-up centers will be equipped for cash handling, with a lockbox and appropriate armored car services. Walk-up centers and the main CSC location will have procedures for receiving checks and depositing them at our bank partner. All toll payers will be encouraged to set up image-based or transponder-based accounts. All channels will be equipped to set up both types of accounts. As determined in business rule discussions with the Joint Board, first time violation fees and possibly minor civil penalties may be waived when the toll payers set up accounts. All channels will have staff that is trained to take payments; and all channels—except retail locations—will have staff that is capable of answering account inquiries and handling billing issue resolutions. Walk-up centers and phone operators will be staffed with CSRs fully qualified and properly equipped to help with all billing questions and account inquiries. Such inquiries may also be made on the website through a contact form: and CSRs will respond to web-based inquiries promptly, in the order that they are received. Billing questions and account inquiries may not be supported from retail locations. Retail locations will provide phone numbers, physical addresses, and web		

Req ID	Customer Service Center (Section CS)	Required	Value Add
	addresses of Walk-up centers, phone, and web contact details. It should be noted that, as determined in business rule discussions with the Joint Board, once violations fees have proceeded to adjudication, they may not be payable from retail locations. Similarly, as determined in business rule discussions with the Joint Board, violations fees forwarded to collections agencies may no longer be payable at various channels.		
CS-003	Customer service representatives shall provide all services related to toll accounts for toll customers, to include account opening, replenishments, account closings, answering inquiries, processing Violations, and handling collections or billing issues.	X	
	Proposer Response: [redacted]		

Req ID	Customer Service Center (Section CS)	Required	Value Add
[redacted]	[redacted]		
CS-004	The Toll System Provider shall provide customer service representatives who can provide basic customer service functions over the telephone, in person, or via mail or the web, for all account types. The Toll System Provider shall provide CSRs who can perform customer service tasks include opening accounts, retrieving account information, updating account information, vehicle information, replenishing accounts, changing credit card or replenishment sources, issuing new or replacement Transponders, accepting returns of Transponders, closing accounts, establishing and billing postpaid accounts, refunding errant charges or remaining balances on closed accounts and assisting customers with troubleshooting. Additional tasks such as cash collection, change runs, inventory control, etc. shall be provided as	X	

Req ID	Customer Service Center (Section CS)	Required	Value Add
	necessary to provide a complete CSC operational facility. Oversight of human resource issues such as time clocks, appropriate conduct and attire are the sole responsibility of the Toll System Provider.		
	Proposer Response: The TCS complies with requirement CS-004 and all tasks listed.. CSRs will be trained on the communications channels mentioned here (telephone, in person, mail and web). CSRs technical training described in CS-002 will include dedicated training for all tasks necessary to perform customer service as noted below including a brief explanation on how each one will be handled: • Opening accounts—this will be carried out as illustrated above in CS-003. • Retrieving account information—using the FastToll ERP system, CSRs may look up all account details, including individual transactions, invoices, and billing records, for any vehicle on an account. • Updating account information--using the FastToll ERP system, CSRs may update account information, including names, addresses, and other details • Vehicle information—CSRs may update vehicle and license plate number information. • Replenishing accounts—CSRs can accept pre-payments with credit cards, or in person they can accept cash or checks. CSRs also process mailed in checks. • Changing credit card or replenishment sources—CSRs can update payment details on recurring or one-time payments. • Issuing new or replacement Transponders—CSRs may issue new transponders. Transponders requested by web or phone will be mailed to customers. • Accepting returns of Transponders—CSRs accept returned transponders—in person at walk-up centers, or via mail. • Closing accounts—CSRs may close accounts, either accepting final payments or repaying unused credit. • Establishing and billing postpaid accounts—using the FastToll ERP system, CSRs may establish post-pay accounts. • Refunding errant charges or remaining balances on closed accounts—if CSRs determine charges were made erroneously, they can refund them • Assisting customers with troubleshooting—CSRs can investigate transaction and billing issues, as well as troubleshoot transponder issues. • All other related CSC services, such as cash collection and change runs, will be operated by dedicated and fully trained staff trained in cash management • All related human resource management such as time keeping, appropriate conduct and attire will be our sole responsibility as the Toll System Provider. We will have in place clearly defined protocols, processes and procedures of work ethic, which we have used and developed over time and incorporated into other similar projects. We will have a team skilled in HR and conduct management.		
CS-005	The TCS and the Toll System Provider's policies and procedures shall support first contact resolution of any customer issues.	X	

Req ID	Customer Service Center (Section CS)	Required	Value Add
	Proposer Response: The TCS and Sanef policy and procedures comply with requirement CS-005 and support first contact resolution. To support first contact resolution, Sanef's first step is to eliminate many issues that would lead to customer contact by promptly notifying the customer. For example, the CSC will notify users of payment success/failure (via e-mail, SMS, or letter), or that their credit card is about to expire, or that their transponder is not mounted or working properly, via automatic notification. Sanef's next step in supporting first contact resolution is through comprehensive training of CSRs as described above in requirement CS-003. During the training, CSRs are given a detailed list of issues about which customers call in from all Sanef's worldwide tolling installations—a list that is available online through Sanef's Knowledge Management system and regularly updated. Second, Sanef supports first contact resolution by giving CSRs the ability to escalate issues while the customer is still on the phone during the first contact. Third, Sanef will work with the Joint Board to establish robust business rules that cover a wide range of situations and minimize ambiguities that could lead to escalation for the Joint Board's consideration. Finally, Sanef will provide continuing education and training for existing call center staff on a regular basis to ensure quick resolution of foreseen and unforeseen issues. The figure left illustrates—at a high level—how Sanef trains its CSRs to handle calls with questions or complaints to maximize first contact resolution. [redacted]		
CS-006	The Toll System Provider shall provide a toll free number for inbound customer calls. The Toll System Provider shall minimize transfers and follow-up calls.	X	
	Note: The Proposer shall demonstrate in this Technical Response Form how its policies and procedures will satisfy this requirement. **Proposer Response:** The TCS complies with requirement CS-006 as follows: The TCS will include a toll-free number for all inbound customer calls. Callers who dial that number will be greeted by the IVR. However, callers will be able to choose to speak to a CSR after the first main menu during business hours. During non-business hours, callers will be able to utilize all aspects of the IVR, but will be directed to leave a voicemail or call back during business hours to talk to a CSR. To minimize transfers and follow-up calls, all CSRs are fully trained to handle a very wide range of questions, as explained above, and have access to Sanef's Knowledge Management system, which contains detailed procedures and FAQs and is continuously updated to include new questions as they come in. Second, Sanef minimizes follow-up calls through first call resolution see CS-005 explained above. Third, Sanef makes two levels of on-duty managers available to each CSR at all times, allowing escalation without transferring the call but more senior and experienced CSRs will be empowered to make on-the-spot decisions in clear cut cases but when further clarification is required on-site managers will be on hand. Finally, for the few issues that cannot be resolved on the first call, customers can request a follow-up e-mail or a call back.		
CS-007	The Toll System Provider shall provide customer service staff access to a complete customer interaction history for all payment channels to support the resolution of a customer inquiry.	X	

Req ID	Customer Service Center (Section CS)	Required	Value Add
	Proposer Response: The TCS complies with requirement CS-007 as follows: FastToll ERP's Customer Relationship Management software will provide full interaction history for all customers. All customer interactions are stored in the FastToll SQL database. After each customer interaction, CSRs fill out a detailed form (electronically within the FastToll CSR interface modules) that documents the customer interaction. Most interactions are of an existing, pre-defined type, but for unusual interactions CSRs can write into the on-line form a description of the interaction. The database is searchable by name, account number, transponder number, and license plate number. To get multiple transactions at once, the CSC can create reports for given start and end date/times. The key data warehousing methodology implemented to support historical data is called Slowly Changing Dimensions (SCD). The CSC provides a data warehousing architecture that tracks historical data by creating multiple records for a given business key in the dimensional tables with separate surrogate keys with effective and expired dates and/or current version indicator. The database architecture is represented in the following diagram. 		
CS-008	The Toll System Provider shall maintain a written record of all customer interactions with the BOS so that TSP shall maintain a complete history of account information.	X	
	Proposer Response: [redacted]		

Req ID	Customer Service Center (Section CS)	Required	Value Add
	[redacted]		
CS-009	The Toll System Provider shall track and categorize all customer communications by customer, type of communication, dispute status and type of problem as recorded in the TCS.	X	
	Proposer Response: The TCS complies with requirement CS-009. All customer communications are stored in the Management Information System (MIS) SQL server database. Every communications record has a field for customer; type of communication, dispute status and type of problem (if any) and a list of generated reports will show all interactions. More details on the Customer Interaction-Resolution and Issue ticket process are included in CS-008.		
CS-010	The Toll System Provider shall access data to handle communications, interactions, and workflow management within the TCS.	X	
	Proposer Response: The TCS complies with requirement CS-010. All TSP staff with appropriate clearances can access communications / interactions records in the MS SQL server database of customer interactions. The FastToll system our CRM module also supports workflow management, including task assignment to qualified personnel, with due dates and automatic notifications to the employee and appropriate managers.		
CS-011	The Toll System Provider shall provide a consistent customer experience across all payment channels.	X	
	Note: Proposer shall describe in this Technical Response Form how its policies and procedures demonstrate that it will provide a consistent customer experience for customers interacting with the CSC to make payments in any of the available methods. **Proposer Response:** [redacted]		

Req ID	Customer Service Center (Section CS)	Required	Value Add
	[redacted]		
CS-012	If the Proposer's system architecture is such that the images are stored at the Roadside System, it is desired that the Toll System Provider provide the ability to retrieve images and Transactions from the Roadside System for any customer communications.		X
	Proposer Response: The TCS complies with requirement CS-012. With our FastToll ERP, images are stored at the roadside system for a very brief period of time — all images are stored in the BOS after the transactions are communicated to the BOS. All images and transactions are retrievable at any given stage of the customer communication		
CS-013	Toll System Provider shall maintain a record of all customer complaints and disputes. All contacts with customers regarding complaints and disputes shall be entered in a customer complaint log and linked to the customer's account, and all subsequent contacts, responses and actions shall be noted in the record, through resolution and final disposition. The record shall identify the customer, means of contact, date, time, issue, action, and identity of CSR responding to the customer information. The record shall be maintained in accordance with the data retention policy period and shall be available to the Joint Board upon request.	X	
	Proposer Response: [redacted]		

Req ID	Customer Service Center (Section CS)	Required	Value Add
	[redacted]		
CS-014	The Toll System Provider shall support the Joint Board and its consultants in communicating with, media representatives, community representatives and other stakeholders.	X	
	Proposer Response: [redacted]		
CS-015	The System(s) shall record and report in the TCS the types of customer communications being received by the TCS including email, fax, SMS, phone call, letter, retail location or Walk-Up Center visits.	X	
	Proposer Response: The TCS complies with requirement CS-015. All customer communications received will be recorded in the SQL database by CSRs as they receive and process the communications (whether electronically or via fax or letter—such communications will be scanned). Our reporting software will automatically generate a report on the numbers and types of communications received for email, fax, SMS, phone call, letter, and visits to retail location or Walk-Up Center. The report format will be adjusted according to wishes of the Joint Board.		
CS-016	The Toll System Provider shall develop procedures, and training materials for responding to customer communications.	X	
	Proposer Response: [redacted]		
CS-017	The Toll System Provider shall provide an option that the customer may select on the IVR to obtain answers to a set of FAQs and answers developed by the Toll System Provider. Toll System Provider shall also include any FAQs and answers that the Joint Board submits to Toll System Provider for inclusion in the IVR FAQs.	X	
	Proposer Response: The TCS complies with requirement CS-017. Frequently Asked Questions will be option on our IVR main menu (along with such items as pay bill, account balance, speak to an operator etc.). We will add any FAQ that the Joint Board submits to us, both to this menu and to more detailed web-based FAQ available by the official website.		
CS-018	The Toll System Provider shall regularly update the FAQs and responses for accuracy and timeliness. Toll System Provider shall describe its procedures for updating	X	

Req ID	Customer Service Center (Section CS)	Required	Value Add
	FAQs and responses in the CSC Operations Plan.		
	Note: Proposer shall describe in this Technical Response Form how it will develop a process and implement a procedure to ensure that the FAQs and responses are regularly updated. **Proposer Response:** The TCS complies with requirement CS-018. We will develop a FAQ at start of the project based on our FAQs in other locations. After tolling start-up, we will review and update our FAQs once a week for at least the first 6 months; later, in a Steady State Operation, once a month (except when a FAQ needs urgent addition or modification) or requests made by the Joint Board. Our online web FAQ and IVR FAQ will be the same, but the IVR FAQ will be split into categories, so it is easier for telephone users to navigate. The first category will be "Common Questions." In addition, CSRs will be instructed to note when customers specifically tried FAQ and did not obtain the answer they were looking for. CSRs will record each question type, and whether it leads to development and inclusion of a new FAQ. For FAQs that CSRs are being asked which are not on the list, a log of such questions will be compiled and reviewed for future inclusion. No matter what level detail and exhaustive development of FAQs, there will always be unforeseen FAQs emanating from customer interactions. As the tolling system moves to Steady State Operations it is likely that very few if any new FAQs will arise unless the Joint Board has defined new business rules or made any changes to the service..		
CS-019	The Toll System Provider shall ensure that the Customer Service Center staff are trained by system Suppliers, and are provided with TSP provided manuals including online manuals to support the resolution of interactions. CSR staff shall also be provided with a decision tree and referral directory.	X	
	Proposer Response: The TCS complies with requirement CS-019. All CSC staff will be trained thoroughly on all Toll CRM related applications and systems by in-house trainers or system suppliers when necessary. In addition, all CSC staff will be provided manuals, primarily (perhaps exclusively) online manuals. Most of the systems that will be used in the CSC have been developed and supplied by Sanef, as they involve substantial customization to existing software. The system suppliers (software developers and integrators) will provide manuals and targeted training to CSC staff when not in the scope of components developed by Sanef. CSR staff will have access to the Knowledge Management System, which includes software manuals, FAQ's, a decision tree for a sizeable number of common inquiries.		
CS-020	The TCS shall have implemented appropriate security and controls to protect the data from unauthorized use and unauthorized users.	X	

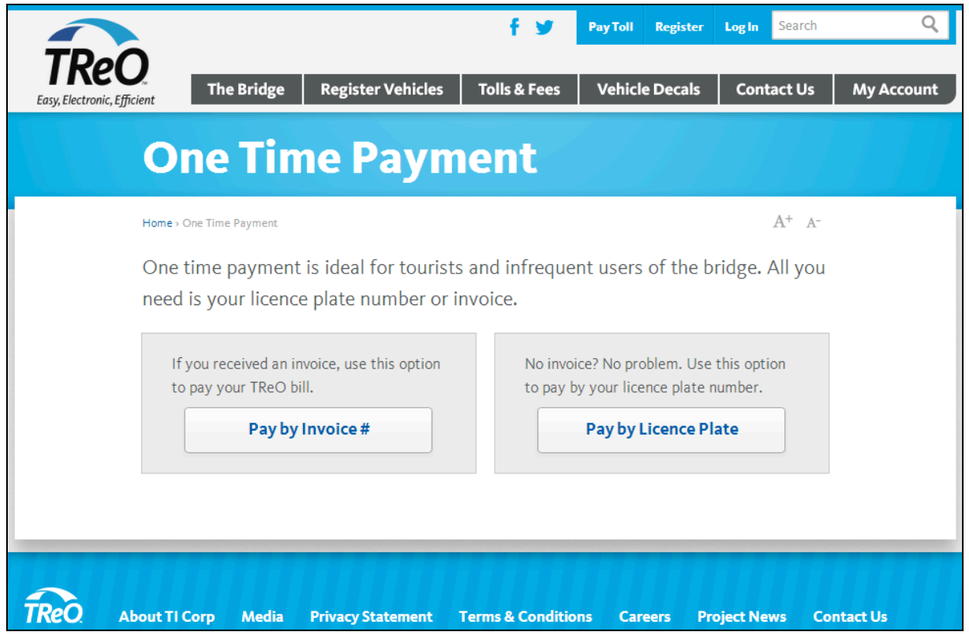
	Proposer Response: The TCS complies with requirement CS-020. At Sanef, security begins with prospective employee screening. No electronic security measures are sufficient if untrustworthy employees have access to the system. Thus, Sanef screens all employees thoroughly: we undertake a criminal background check and credit score check, and we question them thoroughly during the interview process to gain a strong sense that people we recruit are trustworthy. We take such processes very seriously having witnessed examples of misuse of personal data from other projects, all our vetting procedures are thorough and the necessary checks are made.
	
	Electronic security is the other vital element to all Sanef systems. Tolling systems necessarily handle private, sensitive information, such as home addresses and phone numbers, as well as the times and dates a given vehicle crosses a tolling point. Thus, we must ensure data protection to the highest standard is used on all our systems. Protecting data from unauthorized use and users requires two main steps: authentication and authorization, both of which are included in our Security and Access Control Management Plan, presented in outline form as follows:
	• User authentication. The Sanef solution will:
	  ○ Ensure that only authorized users have access to the Account Management application.
	  ○ The access is secured by username and password.
	  ○ Request password changes every month from employees (tolling customer account password changes are requested periodically.
	  ○ Deliver and operate the user authorization via centralized identity management system.
	  ○ Implement a mechanism to verify the identity of an Account Holder who cannot remember their security credentials.
	• User authorization. The Sanef solution will:
	  ○ Define and manage a set of user profiles in order to grant different access levels to the different system modules.
	  ○ Deliver and operate our user authorization via centralized Role Based Access (RBAC) system.		

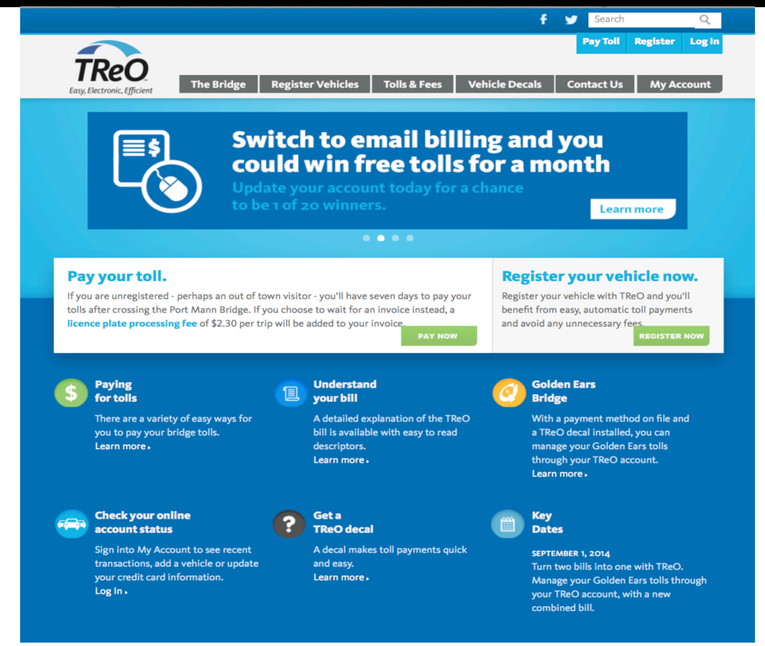
Req ID	Customer Service Center (Section CS)	Required	Value Add
	○ Ensure that any employee handling customer correspondence containing personal information (including payment information such as credit card data) or company sensitive information must ensure this information is secure while in their possession. This includes ensuring no information is left open to display and information is locked away when not in use. ○ Allocate different access rights ('read', 'write', 'add', and 'delete') to the different system users based on their role and requirement thus ensuring security and data protection. All the system users will have unique login credentials to access the system application. The details shall be kept encrypted in the database so that it is secured and protected. All passwords must be considered "strong" by typical internet security standards, and employees are required to change passwords periodically. Remote access to the system is very tightly controlled – only those employees and individuals with a need for remote access (such as managers who sometimes need to travel) are granted it, and they are required to install and use a high-grade VPN to log into the system. Additional security measures in the system include thorough virus checking, advanced Firewall and intrusion detection software. All security software is updated on a daily basis, when updates are available. Further security details, including discussion of encryption, are provided below in CS-078. Access control logs are securely maintained for the entire system. The CSC IT administrator will review security measures with defined schedule of audits, checking for any potential network intrusions, and checking that current security software is sufficient for the needs of the tolling agency. This will be overseen by our IT Security Manager providing the necessary governance following best practices as guided in the ITIL framework – Information Technology Infrastructure Library for IT Service Management.		
CS-021	The Toll System Provider shall provide reports on customer communications status and the resolved reason code for resolution in the Monthly Operations and Maintenance Report.	X	
	Proposer Response: The TCS complies with requirement CS-021. Sanef software includes a MIS SQL Server Reporting toolset to automatically generate monthly reports on a variety of topics. Sanef will request the Joint Board's input on the report format during the discussion and development of corresponding business rules. This software will be used to generate the Monthly Operations and Maintenance Report, an important component of which will be the section on customer communications. The section on customer communications will include monthly tallies of customer access to the system from all channels. All customer communications records will include a basic status (open/closed), and a resolved reason code. During the discussion and development of business rules, Sanef will bring examples of resolved reason codes from other projects such as PMH1 in Vancouver and M50 in Dublin to get the input of the Joint Board. During integration, we will customize our software to support the reason codes agreed to by the Joint Board. These reason codes, along with the communications status, shall be included in the monthly report.		
CS-022	The average mean time for Toll System Provider to respond to all customer communications shall be as follows. • Response to customer emails - 3 days during Startup Operations and 1 day during Steady State Operations. • Response to Voicemails - 3 days during Startup Operations and 2 days during Steady State Operations. • Response to Written Correspondence - 5 days during Startup Operations and 3 days during Steady State Operations. The Toll System Provider shall report the average mean time for response to customer communications on a monthly basis in the Monthly Operations and Maintenance Report, and shall also report minimum and maximum customer communications times.	X	
	Proposer Response: [redacted]		

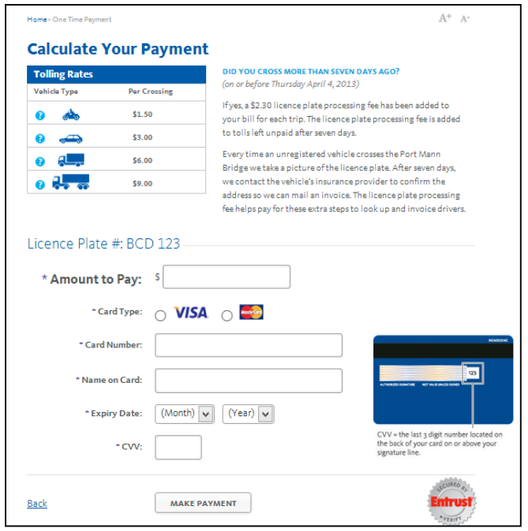
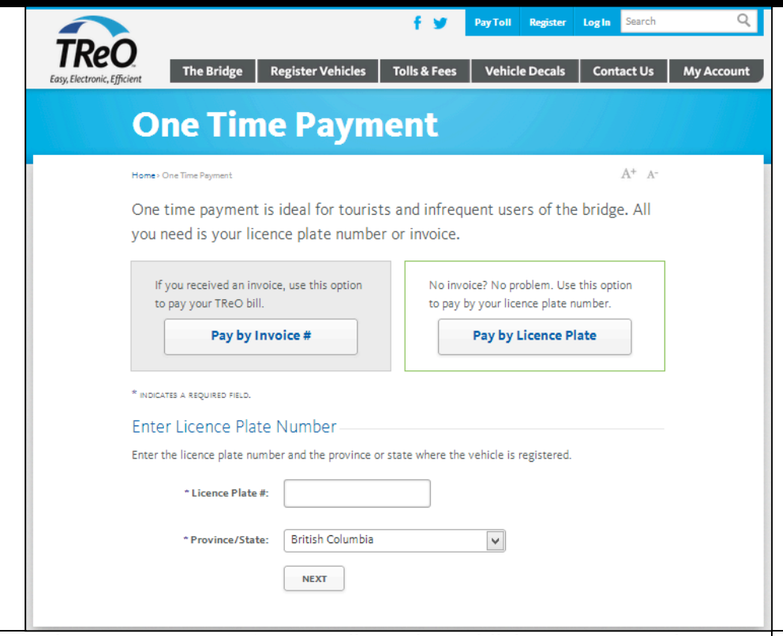
Req ID	Customer Service Center (Section CS)	Required	Value Add
	[redacted]		

Req ID	Customer Service Center (Section CS)	Required	Value Add
	[redacted]		
CS-023	The Toll System Provider and the TCS shall provide capabilities to record in writing customer disputes concerning Customer Statements, processing and enforcement actions.	X	
	Proposer Response: The TCS complies with requirement CS-023. As discussed above in our responses to CS-005, CS-008, and CS-009, all customer complaints or disputes shall be logged and stored in the database and linked to the customer's account. Whenever a customer contacts the CSC with an issue (via phone, web/e-mail, or walk-up center), CSRs shall indicate on the customer contact form that the contact was an issue related to a complaint or dispute, thus initiating a complaint or dispute record. Any disputes about Customer Statements (invoices), processing, and enforcement actions will be recorded in this way.		
CS-024	The Toll System Provider (IVR and Web) customer communication channels shall provide information advising customers of the available service options including identification of the appropriate customer contact point for specific issues, payment of Customer Statements, and directions for converting a Customer Statement to a prepaid ETC Account or Registered Video Account.	X	
	Proposer Response: [redacted]		
CS-025	The TCS shall post Traffic Transactions to existing accounts for customers who have Registered or Unregistered Video Accounts and the TCS shall create accounts based on Traffic Transactions for customers who do not have existing Registered or Unregistered Video Accounts.	X	
	Proposer Response: The TCS complies with requirement CS-025. The TCS will post transactions from registered users—with license plate number and/or transponder information—to the corresponding registered accounts as soon as the transaction reaches the back office (if the license plate number needs clarification, then the transaction will be posted later). If an image contains a license plate number that is not associated with a registered account, the TCS will post the transaction to an unregistered account for the license plate number, if such an account exists. If no account exists for the license plate number in the transaction image, the TCS will create a new unregistered account for the license plate number and post the transaction to that account within the back-office.		
CS-026	The TCS shall provide the means for potential customers who do not yet have an account to access general information about the Project from the Customer Website, IVR or CSRs.	X	
	Proposer Response: The TCS complies with requirement CS-026. The TCS will host a web page that includes general information about the project. One item on the IVR's main menu will be general project information. Finally, all CSRs will be trained on project information so that they can provide general information in case they receive such enquiries from potential customers. Sanef will also work with the Joint board to see that Web contact details, the toll-free phone number of the CSC, and possibly walk-up center and/or retail channel details are posted on signage near the tolling points and elsewhere in the area so that customers know where to go for project information. Below is an example of our homepage for the project in which Sanef operates in Vancouver, Canada. The Port Mann Bridge (PMH1).		
CS-027	The Customer Website shall provide access for customers who do not have a Transponder to pay tolls and Violations or sign up for a Registered Video Account.	X	

Req ID	Customer Service Center (Section CS)	Required	Value Add
	Proposer Response: The TCS complies with requirement CS-027. The Customer Website will support payment by customers who do not have a transponder, including both registered customers who have an image-based account, and new customers who do not yet have an account. The Customer Website will also allow payment of violations. However, pending business rule discussions with the Joint Board, customers may not be able to pay violations once they have moved to adjudications or collections. Also, in business rule discussions with the Joint Board, Sanef will suggest that unregistered users have a certain time (or grace) period in which they can pay the toll without a penalty; after the period is over, they will need to pay the penalty fee. However, it may be possible that, under some circumstances to be discussed and agreed with the Joint Board, the penalty may be waived if, for example, the customer creates an account at the time of toll payment. Below is an example of one-time payment screenshots from the website of one of our current projects, the PMH1 bridge in Vancouver. Note that the option to open a new account, including payment of a toll for a trip already taken, appears on a previous screen and is therefore not included here.		





Req ID	Customer Service Center (Section CS)	Required	Value Add
	 		
CS-028	The Toll System Provider shall provide a user configurable fee structure to be used for customers to make arrangements to pay tolls and establish a payment plan.	X	
	Proposer Response: The TCS Complies with requirement CS-028. In addition to making toll rates configurable as specified by the Joint Board in the toll table, late fees and other fees such as payment plan fees are configurable. We plan to discuss the fee structure with the Joint Board during discussion and development of business rules, and can further adjust the fee schedule if and when the Joint Board chooses to change it later. We will make payment plans available according to business rules agreed with the Joint Board. Payment plan rules will include details such as minimum amount owed to establish a payment plan, minimum payments, total payment periods allowed, etc.		
CS-029	The TCS shall address customer account communications including adding vehicles, requesting a Transponder, account maintenance and payments.	X	
	Proposer Response: The TCS Complies with requirement CS-029. All channels supported by the CSC will support payments, balance enquiry, and transponder requests. Adding vehicles to an existing account may require CSR interaction, and thus not be possible with the retail channel and the IVR channel, but we will finalize this decision during business rule discussions with the Joint Board. A fleet department will be part of the CSC and will be providing account administration support for larger fleet account. A dedicated phone number will be provided to these high profile clients. They will be assisted by fleet CSRs to add, remove or change Vehicles, make payments and manage responders' requests for them. Below is a table highlighting these transactions and where they can be performed:		

Req ID	Customer Service Center (Section CS)	Required	Value Add
	[redacted]		
CS-030	The CSC staff shall identify potential system and service issues from their interactions with customers. Customer Service Center staff shall communicate with and provide feedback to the Toll Operations Center or Joint Board in a timely manner.	X	
	Proposer Response: [redacted]		
CS-031	The Toll System Provider through the CSC shall monitor the Customer Website, provide notices and daily informational updates to the Customer Website as needed, and coordinate those updates for approval by Joint Board. The CSC shall ensure that Customer Website operations meet Performance Requirements by performing routine checks on the Customer Website account management system, and the Customer Website informational page.	X	
	Proposer Response: The TCS complies with requirement CS-031. The Customer Website will comply with the design standards, inclusion and usability requirements, style guides, branding requirements and policy guidance. We will provide frequently updated information on the TCS website on road conditions, maintenance activities, toll payments, and other topics relevant to toll facility users. We will coordinate all updates with the Joint Board. To meet and adhere to performance requirements and Service Levels the Customer Website will be subject to routine checks via automated monitoring by dedicated software and our Social		

Req ID	Customer Service Center (Section CS)	Required	Value Add
	Media Manager In addition, our team will monitor updates of new material to the account management system and informational page.		
CS-032	The Toll System Provider shall ensure that the toll customers' inbound and outbound mail is handled accurately, expeditiously and confidentially while at the same time operating in a cost-efficient manner. The CSC shall log any and all mailroom activity, which is not automatically tracked by the TCS. The CSC shall time and date stamp and log all incoming mail and shipments. The mailroom shall be kept clean and orderly with a minimum of materials out of storage at all times. Valuable items, particularly inventoried items such as Transponders, shall be stored under lock and key when not in use. Mail room services shall be appropriately staffed to ensure that all mail transactions are completed daily with no backlog before close of the mailroom, and in compliance with Performance Requirements.	X	
	Proposer Response: [redacted]		
CS-033	The Toll System Provider and CSC operations shall be responsible for printed material and the preparation and mailing of all outbound mail or shipments including but not limited to: notices of expiring credit cards, notices of account balances dropping below a configurable balance, billing and Violation notices up to and including collection notices, Transponder kits to customers, Transponder retail packages to retail outlets, and Transponders being returned to the manufacturer for any reason. The Toll System Provider shall provide quality control and approval of all outgoing Correspondence before release from the mail house or internally at the CSC. TSP shall assemble typical mail distribution packages that may include a Transponder package kit with marketing branding logos, a mounting instructions sheet and a terms and condition statement. TSP shall use such marketing items, branding or logos as the Joint Board may direct during the Term. TSP shall obtain Joint Board prior approval of Transponder kits, instructions, and packaging.	X	
	Proposer Response: [redacted]		

Req ID	Customer Service Center (Section CS)	Required	Value Add
[redacted]	[redacted]		

Req ID	Customer Service Center (Section CS)	Required	Value Add
	[redacted]		

Req ID	Customer Service Center (Section CS)	Required	Value Add
	[redacted]		

Req ID	Customer Service Center (Section CS)	Required	Value Add
[redacted]	[redacted]		
CS-034	The Toll System Provider shall provide for all users of the toll road the ability to pay tolls automatically with their toll account from interoperable and reciprocal tolling members of the IAG. TSP shall provide CSC services to interoperable agency customers. TSP shall perform regular transaction and financial reconciliation with each interoperable toll agency, and monitor all required file exchanges, dispute processing and resolution and the sending of final reciprocity amounts through the established Joint Board channels for fund exchanges. TSP shall perform all processing including final settlement. The CSC shall service Project toll customers in their use of other toll authorities' facilities to the greatest extent possible as well as fully support "away" customers using the Bridges.	X	

Req ID	Customer Service Center (Section CS)	Required	Value Add
	Proposer Response: [redacted]		

Req ID	Customer Service Center (Section CS)	Required	Value Add
	[redacted]		

Req ID	Customer Service Center (Section CS)	Required	Value Add
	[redacted]		
	[redacted]		
	[redacted]		
	[redacted]		

Req ID		Required	Value Add
	[redacted]		
CS-035	The Toll System Provider shall provide a lockbox operation that includes extensive oversight of the process, controlled access, CCTV monitoring, processes and procedures for disposal of incoming mail materials, archiving if available, control of paper usage in the lockbox area and attention to detail. The Toll System Provider shall provide a staff to support lockbox operations and provide mail-opening processes, scanning of mail procedures, receipt of funds through the mail, acceptance of any Correspondence addressed to the lockbox P.O. Box, and any Correspondence for the Project.	X	
	Proposer Response: The TCS complies with requirement CS-035. Sanef will keep all unopened mail and all valuables in a lockbox located in the Mailroom. Mail opening will take place only in the mailroom, which will be completely covered by CCTV cameras. Sanef has extensive procedures that are used in opening mail, including: • Archiving where necessary • Disposing of paper waste through shredder positioned strategically as needed in the mailroom. • Procedures will explicitly cover all receipt of funds (checks and money orders) through the mail: • Checks and money orders received will be immediately logged and entered into the appropriately identified accounts • Toll CRM postings will show the exact amounts received from checks and all entries will be quality checked • The CSR in charge of payment entries in TollCRM will print a checkout from TollCRM at the end of the shift to match up the total of every batch of payment/shift. • A supervisor will have to sign off and approve the checkout and investigate immediately in case of human error to correct the error. • Cash will not be accepted by mail. • Mailroom staff will be trained thoroughly on these processes.		

Req ID	Customer Service Center (Section CS)	Required	Value Add
	• Further details are provided above in the response to CS-033		
CS-036	The Toll System Provider shall ensure that all money is handled and accounted for in a timely manner. Toll System Provider shall provide the Joint Board with all necessary tools to enable it to track all System activities involving the handling of money and verify reconciliation processes easily and quickly. Employees of the Toll System Provider who handle cash must pass a level of security clearance established by the Toll System Provider and approved by the Joint Board. All TSP Personnel with access to money or account information shall undergo and pass security screenings consistent with Good Industry Practices prior to assignment to the Project. These screenings shall be documented and available for Joint Board review.	X	
	Proposer Response: The TCS complies with requirement CS-036. ***Approach to Cash Handling*** This section shows our principles for ensuring that all money is handled and accounted for in a timely manner. Sanef has detailed procedures for handling money in all common toll-processing events. We propose a closed cash handling system that may improve safety and security of cash handling as well as reducing any errors in cash reconciliation. Cash will only be accepted/used in Walk-up centers. In the Walk-up centers, the cash/change fund and the daily revenue (i.e. the money with which customers paid in the walk-in centers and any checks) will be kept in different strong boxes/vaults. All employees are trained in cash-handling procedures, and each center's on-duty Operations Supervisor is responsible for ensuring these procedures are followed. We will use a cash-transfer service (e.g. Dunbar or Garda) to transport cash to the bank on a regular basis. We recommend the following system that we have previously implemented with success (no hold ups or theft from vaults since 2003). It is a secure system where the vault has a lock that can only be opened with two keys (it has two key holes): • After performing their checkouts each TSP staff persons puts his/her daily collection into a numbered and sealed moneybag. He/she drops the bag through a one-way chute into the vault. No money can be taken out from the vault. The vault is always locked, except when the armored car comes. • The operations manager or duty manager keeps one key. • The armored funds transporter brings the other key when they collect the funds. • The bank representative or representative of the funds transfer company and the duty manager both open the vault together, sign off on the money bags and the funds transporter loads the bags into the armored truck. This effectively prevents both theft and hold-ups. The change fund is the money used to provide each CSR on retail duty (at the CSC or Walk-up Centers) with money in small denominations to give change to customers. The cash float is what we call the change that a single CSR has for his/her shift. Change fund is what we call the whole amount of change available in the center from which to issue cash floats. The supervisor remains responsible for the change fund until another supervisor takes over. The incoming supervisor must sign for the receipt of the change fund on the predecessor's shift report. At the end of each shift, the departing supervisor files his/her shift report. Thus, the responsibility for the change fund is clearly attributable. CSRs on retail duty get from the supervisor their daily cash float. Every CSR who opens a shift in the Toll System has to get his/her own cash float. The CSR signs an acknowledgement receipt for the received cash float. The supervisor keeps that receipt in the change fund strong box (in lieu of the cash float money that is not there any more). Like that the remaining money in the strong box plus all the acknowledgement receipts always add up to the nominal change fund amount. It is thus easily auditable. At the end of a shift, CSRs return the cash float to the supervisor in exchange for the acknowledgement receipt they had signed at the beginning of the shift. They tear up the receipt. The Operations Manager, with the help of the Operations Supervisors, maintains the change fund, ensuring sufficient quantities of all bill denominations and coins. The first principle with any cash in our CSC or Walk-up Centers is a unique responsibility. Each CSR has his/her own cash float. Once a CSR signs the		

Req ID	Customer Service Center (Section CS)	Required	Value Add
	acknowledgment receipt he/she is responsible for that amount. Once he/she has returned the amount to the change fund and gotten the receipt back, it is the supervisor's responsibility. In addition to that comes any revenue collected from sales. Every sale is registered against a unique identifier, which means against a specific CSR and shift. The collected money is therefore that CSR's responsibility. A CSR is not allowed to: • Touch money that has been collected by another CSR • Do any retail transactions that are not assigned to him/her If a CSR has to abandon the sales position (the cash register) for a break he/she has two options: • Lock the system and lock the till (to be confirmed if possible): no-one else can use the register now • Do an interim checkout, take all money (but not the cash float) and deposit it: a reliever can now use the register. The supervisor will decide which option is best at the time. **Receiving money**: CSRs are to check bank notes for counterfeit marks applying the methods of the counterfeit detection training (all CSR will undergo such training). All received money has to be kept in the till until check out. A CSR is allowed to provide another CSR with change, but only in immediate exchange for the same amount in larger denominations (lending change is not allowed). **Check out**: At the end of the shift each CSR performs a check out with the toll system. The CSR is the one to count the money and enter the amount into the system. The supervisor will approve a check out. This approval should not require a count by the supervisor. In case of a system-informed discrepancy the CSR performs a recount. If the result is the same the check out will be completed with the discrepancy. **Audit principles:** The audit principles relate to providing the Joint Board with all necessary tools to enable it to track all system activities involving the handling of money and verify reconciliation processes easily and quickly. The auditor does not touch any money, but he/she can ask the money to be counted by the person responsible for it at the time. The main change fund audit is to count all money in the strong box and then to add the sums of all acknowledgement receipts in the strong box. The sum must always be the same. It must always be the nominal change fund amount of that center. During an on-site audit the auditor may ask any CSR to show and count the money in the cash register. He/she may consult the Tolling System to verify the theoretical revenue belonging to the shift. The auditor may also check merchandise levels (transponders, pre-paid card). He (or she) may also look into drawers and other places around the workplace. The auditor keeps statistics on audit results and performs statistical analysis to uncover systematic irregularities that can point to fraud. ***Provision of Tools to Joint Board to track System activities*** For the second part of the requirement (Toll System Provider shall provide the Joint Board with all necessary tools to enable it to track all System activities involving the handling of money and verify reconciliation processes easily and quickly), we will implement the following approach. Our FastToll ERP system tracks all customer payments into the system and refunds paid out of the system, as well as internal financing. Daily and Monthly, Sanef will prepare a detailed financial report (daily will be automatic / raw data, monthly will be reconciled). The format of the report will be finalized with the Joint Board's input. A report can be prepared with other frequencies if the Joint Board so chooses. All monies can be traced individually throughout the system, allowing our system to be auditable to the highest standards. Reconciliation can be completed easily and quickly. Using these system capabilities, we will provide the Joint Board tools to track system activities involving money handling that they request during the meetings to discuss business rules. ***Screening of Employees*** Sanef takes very seriously all employees screening whether they are handling clients identifying information, credit cards and payment information or handling cash at he walk up centers. Therefore, For the third part of the requirement (on screening employees) and as discussed above, all employees are subject to background		

Req ID	Customer Service Center (Section CS)	Required	Value Add
	checks—extensive criminal record checks and credit score checks—provided by third party background check services. Sanef will discuss with the Joint Board what sorts of criminal activity records are acceptable, and what credit scores are acceptable. Those who handle cash may be subject to more extensive background checks, including calling references provided for all jobs held in the past several years to uncover any possible misconduct, and other measures, which will be discussed with the joint board.		
CS-037	The Toll System Provider shall provide oversight of Transaction processing such that the CSC has valid, accurate and reliable information from the TCS to successfully service the customer accounts.	X	
	Proposer Response: [redacted]		

Req ID	Customer Service Center (Section CS)	Required	Value Add
	[redacted]		

Req ID	Customer Service Center (Section CS)	Required	Value Add
[redacted]	[redacted]		
CS-038	The Toll System Provider shall provide an image review staff and supervisors to manually enter license plates which are not or cannot be read through OCR Software and maintain Performance Requirements for image review staff and backlogs. This team shall be responsible for review of all images that do not pass the OCR with a confidence level of percentage threshold that is configurable in the System.	X	
	Proposer Response: [redacted]		

Req ID	Customer Service Center (Section CS)	Required	Value Add
	[redacted]		

Req ID	Customer Service Center (Section CS)	Required	Value Add
CS-039	The TCS shall process Traffic Transactions and Financial Transactions in the same way for both Project Customers and interoperable customers (except for additional steps as identified within the E-ZPass Agreement) so that both customer groups have the same customer experience.	X	
	Note: This requirement is to ensure that all Transactions are processed in a timely manner and treated in a consistent manner regardless of Transaction type. **Proposer Response:** The TCS complies with requirement CS-039. All transponder transactions are processed in the same way, regardless of whether they are Project Customers or they have E-ZPass transponders from other tolling agencies. When an E-ZPass transaction occurs, the transaction is forwarded to the tag-issuing agency on a daily basis, per the steps in the E-ZPass/IAG agreement. E-ZPass users from other agencies will of course have to log into their tag issuing agency's website to view the transaction, but in all other respects the experience will be the same.		
CS-040	It is desired that the Toll System Provider provide a second image review by a different clerk or supervisor to verify the initial image review clerk's results when a license plate was read and assigned a high confidence level, but the information appears to be incorrect, or the license plate has not been seen before or cannot be recognized or read.		X
	Proposer Response: The TCS complies this value add requirement CS-040. The image review process will comprise a second image review in accordance with this Value Add requirement. Images review takes place with the ALPR algorithm does not give a result that meets prescribed levels of confidence, or information appears to be incorrect (e.g., vehicle type mismatch) or the license is not read by the system. Whenever there is an initial review, there will be a second review (and indeed a third review, whenever the first two do not match). [redacted]		
CS-041	The Toll System Provider shall accurately identify new and un-matched license plates to the correct owner of record using search tools and mechanisms consistent with Good Industry Practices.	X	
	Proposer Response: The TCS complies with requirement CS-041. For all transactions from license plates that are not associated with a Project Customer Transponder, or a Registered video account, the TCS will credit the transactions to an unregistered video account. The TCS will obtain the addresses associated with Indiana and Kentucky license plates using industry best practices, either through formal relationships with the DMVs in the two states, or through a third party that tries to keep even more up-to-date address lists than DMVs. For residents from other states, we recognize that legal enforcement mechanisms will be different and more challenging to implement. Thus, we will create a business rule with the Joint Board about how much of a balance the license plate account must have before it is worthwhile to send an invoice and thus search for the vehicle owner's details. For other states as well, we will use either direct lookups with state DMVs or will use third-party data aggregators to obtain address data associated with the license plates. Because the Ohio border is not so far from Louisville, we expect to see more Ohio license plates than plates of any other state (other than Kentucky and Indiana), so Ohio might merit its own business rule. Finally, if the Joint Board is interested, we might draw upon our Alliance for Toll Interoperability (ATI) transaction hub, which we operate for the ATI to facilitate tolling interoperability between ATI member agencies. We will discuss ATI membership with the Joint Board, if the Joint Board so chooses.		
CS-042	The Toll System Provider shall provide that license plate image interpretation results are accurately entered into Transaction records, through implementation of the image review Business Rules approved by the Joint Board, and shall provide spot checks and internal quality control checks of automated image processing system.	X	
	Proposer Response: [redacted]		

Req ID	Customer Service Center (Section CS)	Required	Value Add
	[redacted]		

Req ID	Customer Service Center (Section CS)	Required	Value Add
	[redacted]		

Req ID	Customer Service Center (Section CS)	Required	Value Add
	[redacted]		
CS-043	The Toll System Provider shall ensure that image review clerks perform quality control procedures on images entered, and update data for those images not recognized automatically.	X	
	Proposer Response: The TCS complies with requirement CS-043. As part of our approach to image review Business Rules mentioned in CS-042, we will implement a double blind review process for all image review of those images not recognized automatically. This process leads to updated data for those images. The quality control procedures were also indicated in CS-042.		
CS-044	The Toll System Provider shall provide that Transponders owned by or in the care of the Joint Board are handled and accounted for in a secure manner. Toll System Provider shall ensure that only authorized users are allowed access to the System or facilities to handle the Transponders. Reports of Transponder inventory shall be generated and reviewed by Toll System Provider not less than monthly. The Toll System Provider shall be responsible for all Transponders under its or its agents or subcontractors' control. This shall include financial responsibility for damaged or stolen Transponders in the Toll System Provider's inventory.	X	
	Proposer Response: The TCS complies with requirement CS-044. Transponder management and access control for handling of transponders will be handled by our dedicated staff with the corresponding processes and training modules developed in conjunction with our overall Security Plan. Only staff members who are trained and qualified to access transponders shall have access to the transponder storage areas, and they shall be trained to lock the storage areas as soon as they are done using the areas. Each time a transponder is moved (from one facility to another, e.g., to a walk-up center), mailed to a customer, sent back for replacement, etc., the		

Req ID	Customer Service Center (Section CS)	Required	Value Add
	staff member moving the transponder will log of such activity in an electronic a transponder management logbook, a software application that runs on the BOS. This logbook of all transponder activity will form the basis for inventory reports that will be developed and delivered by the TSP to the Joint Board. These reports may be monthly, or more frequently, at the Joint Board's discretion. We accept full responsibility for all transponders (including damaged or stolen) under direct control or indirect control under our agents or subcontractors.		
CS-045	The CSC shall accurately track and report the location and distribution of all Transponders. Controls such as bar coding, warranty and location of each Transponder shall be tracked upon initial receipt into inventory, whether in the CSC inventory storage, with a CSR in the CSC or Walk-Up Center, in the mail room or remote facility locations, at a retail outlet prior to sale and registration, assigned to a customer account, reported lost, damaged or stolen, returned to the CSC to be sent back to the manufacturer, or returned for disposal.	X	
	Proposer Response: [redacted]		

Req ID	Customer Service Center (Section CS)	Required	Value Add
CS-046	The CSC shall take a weekly physical count of Transponder inventory, and shall be responsible for inventory reconciliation every week, and when inventory is received, or transferred to and from locations. Inventory reports shall include minimum order levels. The Toll System Provider shall notify the Joint Board when new Transponders need to be ordered. The Joint Board shall purchase the Transponders in the types and quantities recommended by the TSP and transfer them upon receipt to the CSC for inventory management. The Toll System Provider shall verify the receipt of Transponders and shall acknowledge such receipt to the Joint Board. Toll System Provider's notice to the Joint Board requesting Transponder orders must incorporate purchasing lead times to ensure there is never a shortage of Transponders on hand.	X	
	Proposer Response: The TCS complies with requirement CS-046. We will implement procedures for a weekly physical count of Transponder inventory and weekly inventory reconciliation or when transponders are received or transferred from one location to another. We will provide notice to the Joint Board for new Transponder orders with sufficient purchasing lead times to ensure that number of Transponders on hand never leads to a shortage, based on delivery times from the transponder provider. In this regard, we will work with the Joint Board to establish transponder order quantities and lead times based on expected delivery times made by the transponder provider, and potentially add an additional buffer amount to those lead times; however, we cannot be held responsible for a substantial delay in transponder delivery by the transponder provider beyond the expected lead times. As soon as transponders arrive at the CSC, the staff member responsible for receiving the transponders will verify the receipt and send notification in the form of acknowledgement of receipt to the Joint Board in a manner agreed upon with the Joint Board. Then the received transponders will enter our inventory management process, which is detailed in CS-045.		
CS-047	The Toll System Provider shall keep Transponder kits in inventory and include them with Transponders distributed over-the-counter, via mail, or through retail outlets. The kits shall include read prevention bags, Bridge maps, mounting instructions, terms and conditions, marketing and branding logo mailer. The CSC shall be responsible for maintaining an adequate inventory of Transponder kits.	X	
	Proposer Response: The TCS complies with requirement CS-047. The CSC will ensure an adequate supply of all printed material for transponder kits are available at all locations for distribution over the counter, via mail or retail outlets. Based on lead times expected for the printed material and other components of the transponder kits, we will order an adequate supply of printed materials and kits so that we always have such materials for the transponders that need to be distributed.		
CS-048	The Toll System Provider shall provide adequate secured space for Transponder inventory storage, adequate secured space for fulfillment operations and adequate secured space for designated secured locations for mail drop.	X	
	Proposer Response: [redacted]		
CS-049	The Toll System Provider shall support and process Transponders purchased by customers at other E-ZPass interoperable toll agency customer service centers. The TCS shall provide functionality to support monthly fees for different types of Transponder accounts (e.g. E-ZPass accounts may have a service fee whereas the local 6C Transponder based accounts may have no fee or a different fee).	X	

Req ID	Customer Service Center (Section CS)	Required	Value Add
	Proposer Response: The TCS complies with requirement CS-049. Transactions generated at the roadside from E-ZPass transponders will be sent to the BOS, like all other transactions. When the System detects a transponder from another E-ZPass agency, the transaction will be forwarded to the E-ZPass issuing agency per the IAG's Interoperability rules. For transponders issued by the LSIORB toll facility – accounts we will own – our system supports monthly fees that vary by transponder type. It is possible to charge a fee on E-ZPass transponder accounts, while not charging a fee on 6C accounts; or charge fees on both types of accounts, with different fees for 6C and E-ZPass accounts; or charge fees on neither type of account.		
CS-050	The Toll System Provider shall provide staff to oversee, review, and process Violations that are generated from the TCS. This staff shall generate the paper version of the notices, review the notifications electronically and on paper, check the Violation for accuracy, ensure the Customer Statement is appropriate and legible and send the Customer Statement to the mail room for distribution. The Toll System Provider shall provide management that is responsible for answering escalated calls from customers not addressed by the CSR staff.	X	
	Proposer Response: [redacted]		
CS-051	The Toll System Provider shall process all Customer Statements generated by the TCS based on approved Business Rules. It is desired that invoices clearly indicate fees and fines applicable to each individual Traffic Transaction included in the Customer Statement, and the total amount of fees and fines for the aggregate of all Traffic Transactions listed in the Customer Statement based on approved Business Rules. Invoices generated automatically by the TCS shall be reviewed for quality control and accuracy before processing the invoices and sending them to the customer.	X	
	Note: The Joint Board currently anticipates using a three-step Customer Statement process. The first Customer Statement will be for the amount of the toll owed. If that is not paid within thirty (30) days, a new Customer Statement will be sent which will act as a late notice. The charge on that Customer Statement will be for the amount of the toll and a late fee. If no payment is received within thirty (30) days, a final Customer Statement will be sent which will act as a Violation notice. The charge on that Customer Statement will be for the amount of the toll, the amount of the fee previously charged, and the amount of the Violation fine. If no payment is received within thirty (30) days after this Customer Statement is sent, the Violator's account will be moved to the Collection Agency process, whether internal or external to the TSP, and, if the Violator is a citizen of a state with which the Joint Board has a reciprocal video toll enforcement agreement, communications with the DMV in the Violator's state will begin and a hold will be put on the Violator's vehicle registrations. This description is preliminary, is for information purposes only, and is subject to change at the sole discretion of the Joint Board. **Proposer Response:** [redacted]		

Req ID	Customer Service Center (Section CS)	Required	Value Add
	[redacted]		
CS-052	The TCS shall support administrative hearings in accordance with Kentucky Revised Statue Chapter 13B. The TCS shall suspend collections and all determined escalation times during the administrative hearing process. The TCS shall notify the Joint Board by email within 24 hours when an administrative hearing process is requested and all records associated with an administrative hearing shall be linked to the customer account. The Toll System Provider shall provide reports on the current number of administrative hearings by account and current status (e.g. open, pending, closed and associated resolution).	X	
	Note: An administrative hearing can only be initiated by a customer making a request. After the TSP notifies the Joint Board that a customer has made a request for an administrative hearing, the Joint Board will appoint a hearing officer. The hearing officer will send out the appropriate notices and provide the hearing schedule. The TSP will be asked to provide evidentiary support during the hearing. The hearing officer's authority is limited to determining whether the toll charged is owed. Some examples of reasons the hearing officer may determine a toll is not owed include misidentification of license plate, errors in registration look up, and incorrect vehicle classification. If the hearing officer determines that the toll was correctly charged, the Toll System Provider will resume normal collection activities at the point at which they were suspended due to the administrative hearing process, unless the customer appeals the hearing officer's determination to the Kentucky courts. If a customer appeals the hearing officer's decision, the Toll System Provider shall continue to suspend collection activities against that customer until the court issues its ruling. If an appeal is made, the TSP will be asked to provide evidentiary support and possibly to provide a representative to act as a witness. **Proposer Response:** The TCS complies with requirement CS-052. We will provide support for administrative hearing (in accordance with Kentucky Revised Statue Chapter 13B) from the moment that a Customer requests a hearing. When such a request is made, we will immediately stop all violations/collection activities. At all times, we will maintain accurate records of the current number of administrative hearings underway by account and status in terms of open, pending, closed and associated resolution. We will support the Joint Board as follows: • Support administrative hearings.		

Req ID	Customer Service Center (Section CS)	Required	Value Add
	• Notify the Joint Board within 24 hours when a customer requests an administrative hearing that can only emanate from a Customer request. • Link all administrative hearing records to Customer account. • Develop, maintain and provide to the Joint Board reports on number and status of hearings (details to be discussed with the Joint Board). • Provide evidentiary support during the hearing, at the time and place and in the manner requested by the hearing officer. • If charge is upheld, we will resume collection activities unless Customer appeals to Kentucky courts which leads to continued suspension of collection activities. • If the customer makes an appeal to Kentucky courts, we will suspend collection and activity and if and when requested, provide evidentiary support and witness to the Joint Board.		
CS-053	The Toll System Provider shall provide collection services to collect Collection Status Violations in accordance with the approved collections process set forth in the Business Rules during the Collection Status Violation Period. The collection services may be provided by the Toll System Provider directly or subcontracted through the Toll System Provider to a third party service.	X	
	Note: The total compensation to be paid to TSP for collection services as specified in the Toll Services Agreement shall be included within the Total Toll Collection System Operations and Maintenance Price (Years 1 through 7) as specified in the Proposer's Price Proposal, plus the Collection Status Violation Fee, regardless of whether collection services are provided directly by the TSP or through a subcontracted third party service **Proposer Response:** [redacted]		

Req ID	Customer Service Center (Section CS)	Required	Value Add
	[redacted]		
CS-054	The TCS shall provide a threshold dollar amount for escalation of accounts sent to collection. If the threshold is less than the configured amounts, the accounts shall not be sent to the Collection Agency for future pursuit but shall remain as a receivable in the TCS with the outstanding debts including tolls and fees due to the Joint Board.	X	
	Proposer Response: The TCS complies with requirement CS-054. We will establish a threshold dollar amount for escalation of accounts sent to collection. We will not send any accounts to collection until they surpass the threshold amount established in the business rules. However, if accounts remain unpaid, they may incur interest or other penalties that could eventually push them over the threshold, allowing them to be forwarded to a collection agency. At all times, we will maintain accurate and up-to-date information on outstanding debts (inclusive of tolls and fees) as receivables in the TCS due to the Joint Board.		
CS-055	The Toll System Provider shall provide Walk-Up Centers to provide face-to-face account establishment and maintenance service for customers; to distribute Transponders directly to the public; and to support revenue collection and oversight by the Joint Board. The Walk-Up Centers shall accept cash along with credit cards, checks, debit cards, and money orders. TSP shall provide management of a cash bank, armored car pickups, and secured access control at the Walk-Up Centers.	X	
	Proposer Response: [redacted]		

Req ID	Customer Service Center (Section CS)	Required	Value Add
	[redacted]		
CS-056	The Toll System Provider shall lease space in its own name for the Walk-Up Centers. Two locations shall be required. One location shall be in Louisville, KY and the other location shall be in Jeffersonville, IN. At least 3 potential locations for each Walk-Up Center shall be submitted by TSP to the Joint Board for review and approval. At a minimum, Walk-Up Centers shall be equipped with a waiting room with chairs and writing surfaces, counter surfaces or counter space for customers, customer service representative counters, a small mail room and space for backup fulfillment activities, a small printing and production area, an area for copier, printers, and fax machines, a small secured inventory and storage space for Transponder management, an IT closet, a small break room with sink, drinking water, lockers and microwave, a supervisor's office, separate accessible waiting room and hearing room, and one small office for a Joint Board employee on assignment or inspection. Walk-Up Centers shall meet American with Disabilities Act requirements for employees and customers and comply with all applicable Laws, building codes and standards.	X	
	Proposer Response: [redacted]		

Req ID	Customer Service Center (Section CS)	Required	Value Add
	[redacted]		
CS-057	The Toll System Provider shall be responsible for the Walk-Up Center storefront build out and shall provide oversight and timely completion. The Walk-Up Center build out shall be subject to review and approval by the Joint Board. Furniture, equipment, Hardware, Software, supplies, computers, printers, faxes, chairs, waiting room chairs, IT equipment, etc. shall be the responsibility of the Toll System Provider. The budget for the Walk-Up Center build out, construction plans, the furniture plans, and all equipment and supply lists shall be submitted to the Joint Board for approval.	X	
	Proposer Response: The TCS complies with requirement CS-057. We will propose detailed plans and corresponding budget for the Walk-Up Center build out to the Joint Board for review and approval prior to commencing build out. We will submit the budget for the Walk-Up Center build out, construction plans, the furniture plans, and all equipment and supply lists to the Joint Board for review and approval. We will initiate build-out with local contractors as soon as we receive approval of our designs from the Joint Board. As noted in CS-056, the Walk-Up Centers will be designed to accommodate toll customers, staff and the Joint Board. We will take direct responsibility for the procurement, installation and maintenance of all components of the Walk-Up Centers including: • Equipment, • IT components including hardware, software computers, printers, faxes, • Office and computer supplies, and • Furniture and other office equipment including tables, counters, chairs, waiting room chairs,		
CS-058	Toll System Provider shall procure all necessary Utility services for the Walk-Up Centers. The Joint Board shall pay TSP's actual, direct costs incurred for such services as provided in the Agreement. All Utility services must be pre- approved by the Joint Board before TSP enters into any agreement for services to be paid for by the Joint Board as Pass Through Cost Items.	X	
	Proposer Response: The TCS complies with requirement CS-058. We will procure and contract for all necessary Utility services for the two Walk-Up Centers, including heating, water; sewer, electricity, trash service, internet and phone services, and any other needed utilities. We will seek pre-approval from the Joint Board for all Utility services prior to entering into any agreement for services. We will seek reimbursement from the Joint Board for all actual and directs costs provided by approved Utility services to be paid by the Joint Board as Pass Through Cost items.		
CS-059	The Walk-up Centers shall be highly secured retail outlets, with separate secured rooms for inventory, a safe, and cash handling area. Access control and CCTV monitoring shall be required at both locations.	X	
	Proposer Response: [redacted]		

Req ID	Customer Service Center (Section CS)	Required	Value Add
	[redacted]		
CS-060	Call monitoring shall be part of the regular QA/QC process and shall be reported on the Monthly Operations and Maintenance Report. Toll System Provider shall cooperate and assist the Joint Board in the Joint Board's exercise of its right to conduct random monitoring of the CSC and the Walk-Up Centers and record the results.	X	
	Proposer Response: The TCS complies with requirement CS-060. The TCS will utilize a phone system that exports data regarding calls on a nightly basis allowing for computation of the following metrics by type of call (e.g., general question, payment, account setup, complaint): call volumes, call lengths, number of concurrent calls, customer waiting (hold) times, IVR utilization. In addition, the phone system will allow supervisors to listen to any call in order to check and monitor performance by call center representatives. Sanef will cooperate and assist the Joint Board in fulfilling its right and obligation to randomly monitor the CSC and walk-up centers. Sanef will accomplish this in line with the security protocols as described elsewhere. Sanef proposes to designate a list of nominated visitors as chosen by the Joint Board among its staff and contractors who can be granted access on an expedited basis for purposes of random monitoring. All facilities will maintain office supplies and record-keeping materials as required by the Joint Board so that designated Joint Board visitors can conveniently record their findings during random visits. As part of its monthly quality monitoring reports, Sanef will also have regular CSR monitoring performed by the quality team. This will also include audits on the walk-up center, CSC calls, ad-hoc audits on various trackers such as financial refund and reversals, Fleet transactions, procedures and protocols and exempt accounts ensuring full compliance with the requirements and Sanef standards.		
CS-061	The Toll System Provider shall perform ongoing customer satisfaction surveys regarding the CSC and submit the same for quarterly reviews by the Joint Board.	X	
	Proposer Response: The Toll System Provider complies with requirement CS-061. The TSP will collect and review customer satisfaction through a variety of channels and monitor the enquiries and issues (complaints and disputes) process by requesting feedback from customers. Mechanisms for capturing feedback will include but not be limited to: • Online feedback button within the customer-facing website linking to a user satisfaction survey. • The option to take part in a telephone questionnaire. • Email questionnaires sent to account holders periodically. Data from these feedback mechanisms and customer satisfaction surveys will be analyzed for trends and significant issues, and comments will be reviewed with the Customer Relationship Manager and Quality and Performance Manager. Information gathered will inform the improvement plan, which will address required actions in order to enhance the service provided to customers. Sanef will include summary statistics from customer satisfaction surveys obtained through all channels in quarterly reports to the Joint Board. Sanef will maintain raw data including individual survey responses for a period of 6 months for review by the Joint Board upon request. Sanef will maintain all survey data in a single web-based repository password protected with access by authorized employees only.		

Req ID	Customer Service Center (Section CS)	Required	Value Add
CS-062	The Toll System Provider shall use a training program for employees, such that those trained employees shall present a positive, professional image. This training program shall be reviewed and approved by the Joint Board. Employees shall be well trained before handling customers' money, customers' accounts, or interacting with customers in person, on the telephone or through mail or e-mail. The Toll System Provider shall provide a training plan included with the BOS Plan that addresses all areas of the CSC, including technical use of the TCS systems and TCS technical processes, information regarding the Project and customer relations, including dealing with difficult customers and situations. The training program shall be ongoing and continuous.	X	
	Proposer Response: [redacted]		

Req ID	Customer Service Center (Section CS)	Required	Value Add
	[redacted]		

Req ID	Customer Service Center (Section CS)				Required	Value Add
		[redacted]	[redacted]	[redacted]		
	[redacted]	[redacted]	[redacted]	[redacted]		
	[redacted]	[redacted]	[redacted]	[redacted]		

[redacted]

[redacted]by

Req ID	Customer Service Center (Section CS)	Required	Value Add
	listening to an instructor and by observing the actual process as it takes place. Validation of the training plan's effectiveness will be made through the use of a learning [redacted]		

Req ID	Customer Service Center (Section CS)	Required	Value Add
	[redacted]		
CS-063	The Toll System Provider employees' appearance, demeanor, and behavior shall be professional and courteous at all times.	X	
	Proposer Response: The TSP complies with requirement CS-063. As described above in CS-062, our Training Plan emphasizes professional, courteous behavior by all staff at all times, but particularly for all customer-facing staff and for all customer interactions. Moreover, our customer feedback channels and organizational reporting structure allow us to identify issues with employee behavior quickly and effectively to minimize any detrimental impact on operations, customer perceptions, and financial performance metrics.		
CS-064	It is desired that the Toll System Provider compensate full-time and part-time employees with competitive salaries and all normal privileges, benefits and guarantees of employment that are afforded to the Toll System Provider's existing regular and part-time employees. This includes providing benefits such as medical coverage, retirement plans, sick leave, vacation pay and holiday pay. The Toll System Provider shall provide employees with a benefit package that keeps employee turnover to a low rate.		X
	Proposer Response: [redacted]		

Req ID	Customer Service Center (Section CS)	Required	Value Add
	[redacted]		
CS-065	The Toll System Provider shall provide a dedicated CSC manager to oversee the CSC to ensure that procedures and internal controls within the CSC adhere to Performance Requirements. All CSC management and supervisory personnel assigned to the CSC shall be approved in advance by the Joint Board. The Toll System Provider shall submit a complete personnel and staffing plan included in the CSC Operations Plan outlining all job descriptions in each of the functional areas to the Joint Board for its review and approval.	X	
	Proposer Response: [redacted]		

Req ID	Customer Service Center (Section CS)	Required	Value Add
	[redacted]		
CS-066	The Toll System Provider shall submit requirements for employment at the Toll System Provider's company and affiliated Subcontractors for CSC services in the CSC Operations Plan. These employment requirements shall outline items such as legal citizen status, photo identification from a governmental agency, ability to clearly speak English or English and Spanish, education requirements, etc. These requirements shall be reviewed and approved by Joint Board.	X	
	Proposer Response: The TCS complies with requirement CS-066. As part of our CSC Operations Plan mentioned in CS-065, we will detail all job descriptions. These job descriptions will clearly state all requirements for each position sought, including technical background or training, level of education achieved, language abilities, speaking and writing abilities, legal employability (e.g., proof of age, citizenship, and residence, including photo ID), and any physical demands of the workplace. Sanef commits to achieving mutual agreement of these requirements for all job categories as part of the CSC Operations Plan.		
CS-067	The Toll System Provider shall provide CSC supervisors and staff to monitor the IVR and associated dashboard to ensure Performance Requirements are met. The supervisors shall move staff to appropriate operational tasks to ensure performance levels meet or exceed the Performance Requirements.	X	
	Proposer Response: [redacted]		

Req ID	Customer Service Center (Section CS)	Required	Value Add
	[redacted]		

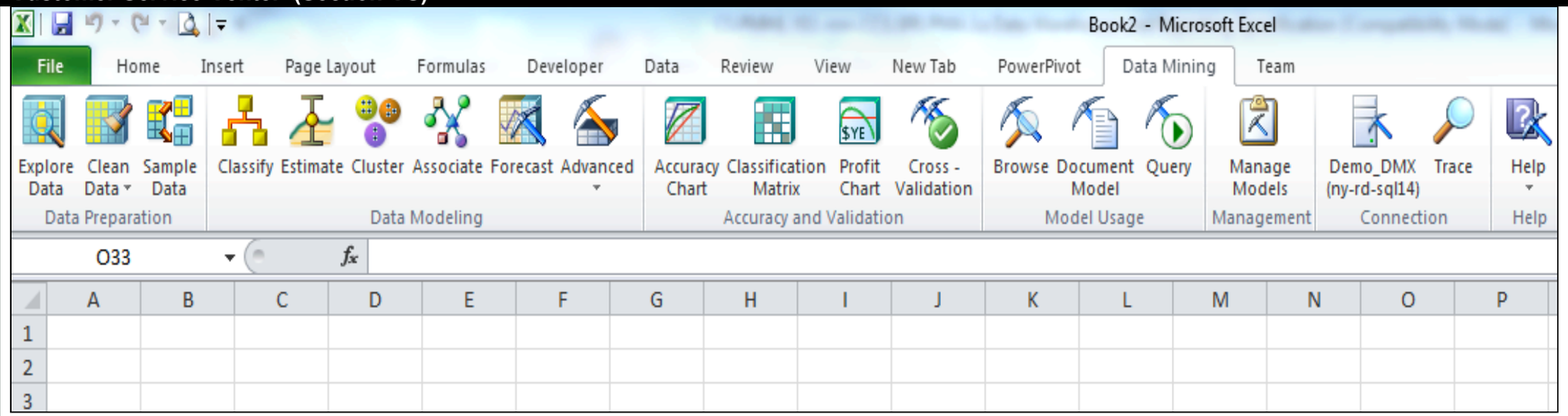
Req ID	Customer Service Center (Section CS)	Required	Value Add
	[redacted]		
CS-068	The Toll System Provider shall provide reports on all customer service representative account-related activities on a monthly basis in the Monthly Operations and Maintenance Report, and at any time upon request by the Joint Board. These reports shall be in a format approved by the Joint Board and shall include, at a minimum, calls received per day and by hour, calls received by the IVR per day and by hour, calls received by the IVR then directed to a CSR per day and by hour, calls directly to CSR per day and by hour, customer service representative availability, customer service representative utilization, telephone center activity logs, average wait time by day and by hour, average talk time by day and by hour, average after call work time by day and by hour, and abandoned calls by day and by hour. These reports shall be graphically presented for use by Joint Board and the CSR supervisory staff.	X	
	Proposer Response: The TCS complies with requirement CS-068. Sanef believes that a successful partnership with the Joint Board depends on clarity of expectations, transparency of objective data, and frequent and open communications. The Monthly Operations and Maintenance Report is one of our opportunities to provide concrete, objective evidence of our performance not only to the Joint Board but also to ourselves. It provides a check for the Joint Board that we are delivering on our promises, and it allows our management to reward strong performance, reallocate resources to continually optimize system operations in the face of a dynamic customer market, and identify and address areas for improvement together with the Joint Board. Sanef is confident in the abilities of our systems and people to deliver a customer service operation of only the highest quality. Following are more technical details on how we propose to build the capability to deliver these reports in a consistent, repeatable, efficiency, and responsive way. All performance reporting including all data outlined in requirement CS-068 will be produced as part of an enterprise-wide management information system (MIS) comprising a series of relational databases drawing on data sources from throughout our operations. The process for making information available via the MIS include the following: • Development of ETL (Extract, Transform and Load) processes to export data from production data repositories and load it into a dedicated reporting Data Warehouse. • Incorporation of ETL processes into a schedule so that they are run periodically at a suitable interval driven by the report frequency—in the case of the Operations and Maintenance Report, monthly. • Development of reports to visualize the data via the most appropriate method. The format of all reports shall be agreed jointly with the Joint Board and the CSC Manager prior to implementation, and we will update the format periodically as areas of emphasis evolve from ramp-up to start-up to normal operations. • Provision of a set of reporting and data mining tools to allow users of the MIS to manipulate (but not change) data to their own requirements, should any further detail be required following any particular monthly report. • Inclusion of the report in a schedule of reports that is officially supported and maintained by the TSP via its service desk. The table below summarizes all technologies that will be deployed to deliver the MIS. Much of the MIS will be built around Microsoft SQL Server and accessed via a Virtual Desktop Environment controlled by active directory global policy. User authentication and authorization will also be provided by Microsoft Active Directory. Any issues with the MIS shall be logged via the Helpdesk where the Tier 1 Support Team will address them. All of the MIS components shall be implemented by Sanef directly and not by a third party supplier.		

Req ID	Customer Service Center (Section CS)				Required	Value Add
	Sub-System	**Functional Component**	**Technology**	**Supplier**		
	MIS	MIS Reporting Toolset	Microsoft SQL Server Reporting Services Microsoft Business Intelligence Studio Microsoft SQL Server Analysis Services Microsoft SQL Server Integration Services Microsoft SQL Service Management Studio Microsoft SQL Service Database Engine Tuning Advisor Microsoft SQL Server Profiler Microsoft SQL Server Configuration Manager Kimball Microsoft Data Warehouse Tool Kit Data Mining Add-ins for Microsoft Excel Table Analysis for Excel PowerPivot for Excel	Sanef		
	OSS	Helpdesk & CMDB	SolarWinds Web Helpdesk	Sanef		
	ISS	Virtual Desktop Environment	Citrix Secure Gateway Citrix VDI-in-a-Box	Sanef		
	ISS	Directory & Naming Services	Microsoft Active Directory Microsoft DNS	Sanef		

Tools used for data mining and predictive analysis are the Data Mining Add-ins provided by Microsoft Excel 2010. The following are the data mining functions provided by the Microsoft Excel 2010 Data Mining Add-ins:

- Microsoft Association Rules;
- Microsoft Clustering;
- Microsoft Decision Trees;
- Microsoft Linear Regression;
- Microsoft Logistic Regression;
- Microsoft Naïve Bayes;
- Microsoft Neural Network;
- Microsoft Sequence Clustering;
- Microsoft Time Series.

The following diagram shows the Data Mining Add-ins for Microsoft Excel 2010.

Req ID	Customer Service Center (Section CS)	Required	Value Add
			
CS-069	The Toll System Provider shall provide reports on all mail room activities on a monthly basis in the Monthly Operations and Maintenance Report, and at any time upon request by the Joint Board. These reports shall be in a format approved by the Joint Board and shall include, at a minimum, inbound mail by source, category, type and origin, outbound mail printed and prepared, incoming mail received and processed by the post office, daily cost of postage which shall be paid by the Joint Board and any backlog of incoming or outgoing mail.	X	
	Proposer Response: The TCS complies with requirement CS-069. Our response to CS-068 details our management information system (MIS), which will be our IT backbone for developing the Monthly Operations and Maintenance Report. All mailroom activities will be input by mailroom staff and checked by supervisory staff via an interface to the data input portion of the MIS. Because some mailroom activities will be entered manually, Sanef proposes to include one or more mechanisms for correcting any erroneous data held within the MIS. All changes made to MIS data will have an audit trail.		
CS-070	The Toll System Provider shall provide accounting and reconciliation reports on a monthly basis in the Monthly Operations and Maintenance Report, and at any time upon request by the Joint Board. These reports shall be in a format approved by the Joint Board and shall include at a minimum an accounting of cash and all other payments collected at the CSC storefronts, Walk-Up Centers, retail distribution outlets under contract, and by mail; account deposits, shortages and overages, adjustments due to daily reconciliations, and customer accounts balances, CSC and VPS activities; tolls collected and tolls posted, recommended fund transfers, deposits and withdrawals by CSC for each shift, number of Transaction types, deposits by payment type, cash deposits, low, high and average values of, the account balance activity including beginning-of-day and end-of-day balances, all tolls and fees, and replenishments, and interoperable account activities for interoperable home and away Traffic Transactions and Financial Transactions reconciliation and settlements.	X	
	Proposer Response: The TCS complies with requirement CS-070. As detailed in CS-068, Sanef proposes to build a management information system to automate the production and delivery of Monthly Operations and Maintenance Reports, including all financial aspects including accounting and reconciliation reports as part of the overall monthly report and available upon request by the Joint Board. These reports shall also be in a format approved by the Joint Board.		
CS-071	The Toll System Provider shall provide monthly staffing reports included in the Monthly Operations and Maintenance Report. The weekly staffing report shall be in a format approved by the Joint Board and shall include workforce number per job description, percentage of required positions filled, progress and efforts being made in filling the vacant positions and turnover rates.	X	

Req ID	Customer Service Center (Section CS)	Required	Value Add
	Proposer Response: The TCS complies with requirement CS-071. As detailed in CS-068, Sanef proposes to build a management information system to automate the production and delivery of Monthly Operations and Maintenance Reports, including all staffing related issues such as staff in each job description, percentage of required positions filled, progress and efforts being made in filling the vacant positions and turnover rates. Some of these data will require manual inputs by the CSC Manager. All monthly reports will go through a QA process including double-checking by at minimum two managers, including the CSC Manager, prior to transmission to the Joint Board and other supervisors. These checks will allow for discussion and resolution of qualitative aspects presented as part of the monthly reports that cannot be traced to automate, objective data entries. Moreover, every 3 months, management will review the contents of the monthly report in collaboration with the Joint Board to ensure that report contents continue to meet mutually agreeable and desirable objectives as far as reporting on performance targets and driving operational and customer service excellence. As the operation evolves and matures, the contents of the report may need to change to reflect the changing emphasis on various metrics and possibly even new metrics that emerge over time.		
CS-072	The Toll System Provider shall provide daily, weekly and monthly production and productivity reports, and accuracy reports related to the number of OCR images which required changes. These reports shall be stored in the TCS and shall be sortable by location and by image review clerk.	X	
	Proposer Response: The TCS complies with requirement CS-072. This requirement goes to the core of Sanef's strength not just as a system integrator but also as a human integrator. Image review is a labor-intensive process that requires selecting the right people with the right skills and combining them with a system that puts them in a position to perform at the highest levels. We have a detailed strategy for combining our industry-leading FastToll software OCR and image review modules with our staffing and management plan. In order to provide an audit trail for these processes, our system stores all image review data for a period of defined months, which is a configurable setting. (e.g. X months). These data and trends allow us to monitor the performance not only of the automated aspects of the system but also the human aspects, as we can identify performance by camera location as well as by image reviewer, giving us detailed data for analysis as well as real-time notifications of variances that require attention either to the technology or human aspects of the system.		
CS-073	All facilities provided by the Toll System Provider shall be secure, and only authorized staff shall be allowed access into the facilities other than areas of the WUC designated for general public access. The Toll System Provider shall provide a security and access control management plan included with the BOS Plan that clearly identifies how access is granted, managed and maintained through employee attrition.	X	
	Proposer Response: [redacted]		
CS-074	The Toll System Provider shall ensure that no unauthorized personnel shall have access to individual records, payment histories, any personal information for Project	X	

Req ID	Customer Service Center (Section CS)	Required	Value Add
	Customers or interoperable toll customers. Paper records shall be locked when not in use, and password and identification controls shall be employed for data access.		
	Proposer Response: [redacted]		

Req ID	Customer Service Center (Section CS)	Required	Value Add
	[redacted]		

Req ID	Customer Service Center (Section CS)	Required	Value Add
	[redacted]		
CS-075	The Toll System Provider shall not allow cellular telephones, cameras, or other electronic mobile devices capable of capturing still images or video in any area where customer information is visible other than areas of the WUC designated for general public access. CCTV shall be utilized to monitor and deter any and all illegal or unauthorized activities in the CSC. CCTV coverage shall cover all areas of the CSC floor operations, lockbox operations, image review operations, and Transponder fulfillment operations.	X	
	Proposer Response: [redacted]		
CS-076	The TCS shall protect all customer data from access by unauthorized users. The TCS shall ensure that only properly authenticated customers can obtain access to their own data.	X	
	Proposer Response: The TCS complies with requirement CS-076. As detailed in our Security Plan, we will employ strict data security standards and protocols for all media, including customer data stored on servers, on CD-ROMs, on paper, and all other media via a carefully delineated access control policy that encrypts user data and reveals data only upon activation with proper credentials by a customer.		
CS-077	[Intentionally not used.]		
CS-078	For customer authentication, the TCS shall require input of data fields (e.g., name, address, Transponder ID and license plate number) that uniquely identify that customer.	X	
	Proposer Response: [redacted]		

Req ID	Customer Service Center (Section CS)	Required	Value Add
	[redacted]		
CS-079	For customer authentication, the Customer Website shall require input of data fields (e.g., name, address, phone number, Transponder ID and license plate number) that uniquely identify that customer.	X	
	Proposer Response: The TCS complies with requirement CS-079. Our Security and Access Control Management Plan will detail our approach to maintaining customer access only by authentication using unique identifiers such as unique and acceptable username and password combinations. The outlines of this plan are summarized in CS-078.		
CS-080	The Toll System Provider shall provide a separate phone system outside of the IVR system for typical business calls to be received by the CSC and the CSC staff.	X	
	Proposer Response: The TCS complies with requirement CS-080. Sanef will maintain two separate phone systems, one for the IVR and customer service channels designed for customer interactions, and a second for business-to-business interactions between Sanef and our partners and stakeholders including the Joint Board. Contact information including telephone numbers for the separate phone system will not be published but rather be distributed to our partners and stakeholders for purposes of conducting regular business using a more appropriate channel that does not interfere in any way with our customer communications, which are dedicated and reliable.		

Req ID	Customer Service Center (Section CS)	Required	Value Add
CS-081	The Toll System Provider shall provide an approved security and compliance policy manual to each of its employees and shall obtain a signed copy of the acknowledgement of the security and compliance manual and ensure that all employees working under the Toll System Provider in the CSC are aware of the security policies and enforce compliance.	X	
	Proposer Response: The TCS complies with requirement CS-081. As detailed in CS-062 training our staff is a vital aspect of our solution. Through our Learning Management System, which covers various methods of training for various periods of operations (ramp-up, start-up, normal operations), we will cover security and compliance at every phase as an essential aspect of basic orientation. A prerequisite for successful completion of orientation, which is itself a requirement for continued employment, is for all staff to indicate their acknowledgement of our security and compliance policy manual via signature of a written affirmation. These records will be kept electronically and in paper as necessary as part of our human resources records to provide evidence of training and acknowledgement of the need for compliance by all staff.		
CS-082	It is desired that the Toll System Provider have a dashboard and monitor in the CSC, such that the screen is visible to all customer service representatives and supervisors for viewing the current status of calls, wait times, and number of customers on hold.		X
	Proposer Response: [redacted]		
CS-083	The Toll System Provider shall provide weekly payroll statements to the Joint Board and have records easily accessible and viewable for review by the Joint Board. At a minimum, the employee name, hours and role of employee shall be included in the payroll statements.	X	
	Proposer Response: The TSP complies with requirement CS-083. The Sanef solution includes a web-based payroll system that allows employees to view and manage payroll settings online via secure login. Our human resource manager will be able to create reports on a weekly basis summarizing all employee payments by name, hours worked, job title, and other factors such as overtime hours, pay rates, and performance bonuses. Although Sanef will automatically generate reports on a weekly basis, the human resources manager will review reports before submittal to the Joint Board to ensure clarity, consistency, completeness, and correctness of the reports.		
CS-084	The Toll System Provider shall provide operating procedures and manuals included with the BOS Plan that provide clear direction to CSC employees governing the basic roles of their job assignment. These manuals shall be available and on site for inspection and review by Joint Board throughout the Term of the Agreement.	X	
	Proposer Response: The TCS complies with requirement CS-084. As stated in CS-062, we will train our staff continuously in both general aspects (e.g., orientation including security, safety, and human resources issues) as well as specialized training in areas specific to each employee type. We will use as the basis for this training manuals for each specialized position. The manuals will detail operating procedures, job assignments, reporting structures, and other details specific to each job. In addition to ensuring our staff is familiar with these manuals through the training process, numerous copies of the manuals will be permanently available in both print and electronic copy, including publishing to company Intranet. Any updates to the manuals will be communicated to appropriate employees via email and memos, and addressed during training refreshers. Updated manuals will be include effective dates and the most recent manuals will always be available upon inspection by the Joint Board for the length of the project in both print and electronic form.		

Req ID	Customer Service Center (Section CS)	Required	Value Add
CS-085	The Toll System Provider is responsible for providing all Hardware, Software and/or any other equipment for the Toll System Provider's internal or program use purposes. The Toll System Provider shall provide all Hardware, Software, furniture, chairs, phones, headsets, mice, computers, power cords, wireless connectivity, and any other equipment and supplies to provide a fully operational CSC with all capabilities required by the Contract Documents. These include, without limitation, CSR phone bank equipment, furnishings and supplies; image review equipment, furnishings and supplies, Transponder fulfillment equipment, furnishings and supplies, supervisor and management computers, equipment, furnishings and supplies; mailroom operations equipment, furnishing and supplies; Violation processing equipment, furnishings and supplies, interoperability equipment and supplies, lockbox equipment, furnishings and supplies; administrative and courts collection equipment, furnishings and supplies, internal Software programs, third party programs such as MS Office, internal company email applications, quality control programs and associated Software programs and Hardware, all training equipment and training stations, all training materials, all policy and procedure manuals, printers, copiers, faxes, internet connections, desk and furniture supplies, office supplies, printer cartridges, and any types of shared drives or repositories, etc.	X	
	Proposer Response: The TSP complies with requirement CS-085. Sanef has experience delivering complex hardware and software solutions including all components necessary for a fluid ramp-up and start-up to full normal operations. This means delivering all necessary equipment and hardware not only to satisfy technical requirements and enable customer account management and excellent customer service but also as part of that providing the basic building blocks of a fully equipped, comfortable, safe workplace with high customer motivation and retention. The table below summarizes the resources we intend to source to supply all hardware, software, and other equipment necessary to deliver the full solution:		

Category	Item	Description
[redacted]	[redacted]	[redacted]

Req ID	Customer Service Center (Section CS)	Required	Value Add
[redacted]			
CS-086	It is desired that the Toll System Provider provide the ability to provide color high quality customer Correspondence from the CSC. Applicable Correspondence includes but is not limited to escalation, Violation and collection notices.		X
[redacted]	**Note:** The Proposer shall provide actual samples of all customer Correspondence in this Technical Response Form. This includes but is not limited to 1st, final and any intermediate invoices, Violations notices, debt referral letters, court templates, low balance notifications, credit card expiration or any other applicable Correspondence. Proposer shall identify text and configurable parameters on the Correspondence in this Technical Response Form. **Proposer Response:** [redacted]		

Req ID	Customer Service Center (Section CS)	Required	Value Add
[redacted]	[redacted]		

Req ID	Customer Service Center (Section CS)	Required	Value Add
[redacted]	[redacted]		

Req ID	Customer Service Center (Section CS)	Required	Value Add
CS-087	The Toll System Provider shall provide phone lines capable of supporting a TCS that anticipates an increase in call volume that would be expected to be associated with handling 100,000 additional daily Traffic Transactions above the number of Traffic Transactions currently handled by the Toll System Provider at its existing CSC, or if Toll System Provider elects to provide a new CSC, phone lines capable of supporting a the call volume expected to be associated with 100,000 daily Traffic Transactions, assuming, in either case, that 50% of those Traffic Transactions occur as ETC Traffic Transactions at the commencement of Revenue Service.	X	
	Note: The Proposer shall at a minimum provide the following information in this Technical Response Form: Total number of CSRs in call center Total number of CSRs added to call center for the Project Ratio of CSRs to supervisors Ratio of CSRs to lead CSRs, if applicable. Total number of customers serviced by the Call Center Currently on a daily basis Total number of customers serviced by the Call Center Currently on a monthly basis A description of how additional volume is handled such as as a result of promotions, Violation mailings, or customer invoicing mailing? If the CSC services numerous clients, a description of how priority of service to each client is determined. Which clients receive priority and why on days of high call volumes? Indicate the number of dedicated phone lines that will be provided to the Project. Explain Proposer's existing phone system configuration and Proposer's anticipated phone system configuration upon the addition of the Project. **Proposer Response:** [redacted]		

Req ID	Customer Service Center (Section CS)	Required	Value Add
	[redacted]		
CS-088	The Toll System Provider shall provide dedicated commercial customer service specialists to service commercial LSIORB account holders.	X	
	Proposer Response: The TSP complies with requirement CS-088. We describe our approach to handling commercial accounts using customer service specialists (CSSs) in requirement CS-067. To recap: CSSs are customer service representatives with additional training and responsibilities authorized to deal with certain types of complaints and disputes. They can make decisions on imposing or waving interests and fees. For customers and clients this means faster resolution (no need to wait for the supervisor). Our large business customers will be assigned *dedicated* CSSs. This means a business customer deals with the same person almost every time. This means only very few business customer requests need to be escalated to a superior. Like regular CSRs, CSSs will also report to customer service supervisors.		

Tolling Operations Center Requirements

Req ID	Toll Operations Center (Section TO)	Required	Value Add
TO-01	The Toll System Provider shall provide a Maintenance Online Management System (MOMS) that supports maintenance operations for all Software and Hardware provided in connection with the Project or otherwise pursuant to the Agreement. The Toll System Provider shall also operate the MOMS. MOMS shall have two major components, a system monitoring component that provides alarms and configuration management and the inventory management to track all devices.	X	
	Proposer Response: The MOMS complies with requirement WF-001 in the following manner: Sanef will deliver to the Authority its Maintenance Online Management System (MOMS) for the management and control of all maintenance-related operations. This module has been developed in house specifically to interact with the Sanef back office and roadside systems being proposed. The MOMS is closely integrated with the roadside multi-lane free flow equipment. The MOMS has been part of the Sanef TCS solution for over 15 years and has been used at the following facilities: • Golden Gate Bridge, San Francisco CA • Richmond Metropolitan Authority (RMA), Richmond VA • Pocahontas 895, Richmond, Virginia • PRHTA, US Territory Puerto Rico • Detroit-Windsor Tunnel, Detroit MI • Blue Water Bridge, Sarnia Ontario Canada • Niagara Falls Bridge Commission, USA • PR22 & PR5, US Territory Puerto Rico • Port Mann Highway 1, Canada • Golden Ears Bridge, Canada • Teodoro Moscoso Bridge, Puerto Rico • MAIPO in Chile • South Bay Expressway, USA • M50, Ireland • Rhode Island Transportation and Bridge Authority, USA Feedback from the Sanef MOMS user community has been positive and their recommendations for improvement have been incorporated into the latest version of the MOMS and future roadmap. Sanef maintenance personnel are well trained in the use of the MOMS and how it is applied as a tool in supporting the tolling system as a whole. The primary modules within the MOMS include inventory management; equipment lifecycle tracking; alarm and event monitoring; report generation; work order creation; and configuration management. The MOMS interacts with various external elements to communicate with technicians and operations staff. The following diagram provides an overview of MOMS system monitoring capabilities:		

Req ID	Toll Operations Center (Section TO)	[redacted]	
	[redacted]		
[redacted]	The Toll System Provider shall provide support and maintenance services for all Systems provided by the TSP, including but not limited to: 1) maintaining the access control system configuration; 2) maintaining the databases, applications, and the Data Mart including data aggregation processes, database optimization of the database schema and Data Mart schema; 3) maintaining proper indexing on all databases; 4) responding to all MOMS alerts and performing repairs and corrections, and 5) providing Software fixes for defects and malfunctions.	X	
	Proposer Response: The MOMS complies with requirement TO-02 in the following manner: Because Sanef develops, operates and maintains all of the systems that it provides to clients with contracts similar to this one, such as our clients at PMH1, M50, and at Dartford, we have the necessary tools and expertise to efficiently meet the operational requirements of this contract. We will provide the services listed above as follows: 1. As part of the operations contract, Sanef IT staff will maintain the access control system configuration; 2. Sanef Data Base Administrator(s) (DBA) assigned to the maintenance of the system will have participated in its development and optimization during the		

Req ID	Toll Operations Center (Section TO)	Required	Value Add
	delivery portion of the contract. They will continue with the project to provide all the scheduled database maintenance functions as well as to troubleshoot and remedy any faults, failures or anomalies identified during the operations portion of the contract, this scope of services will include the databases, Data Mart, schema optimization and other processes that are performed within the database. The maintenance of the applications will involve the same DBAs but will also include the support from our other development staff that have specific application development skills; 3. Sanef's DBAs will maintain the database indexes and identify any data corruption, repair it and take the necessary steps to resolve the root cause of the corruption. 4. The Sanef MOMS permits the prioritization of alarms, and depending upon the priority, notifications are sent within predefined timeframes (immediately for urgent problems) to technicians on call. This notification process permits a hierarchy in the response. Sanef ITS staff, from the field level technician to the general manger of the tolling operations site, as well as remote support technicians located in NY and Paris, are all part of the notification hierarchy and available to receive alarms from the MOMS. Once acknowledged, the appropriate staff member will work to resolve the cause of the alarm within the timeframes specified in the contract; 5. When a failure occurs that requires a software fix, the Sanef ITS staff will, depending upon the nature of the fix and failure, develop a patch for the immediate problem or include it in a future release update.		
TO-03	The TSP shall operate and maintain the TCS so as to provide comprehensive System monitoring services. The Toll System Provider shall include a secure web based real time monitoring system to monitor and report the status of all System components; and assign priorities and actions to events. The monitoring system shall at a minimum: 1) monitor Hardware and Software health; 2) provide and operate a dashboard that graphically displays components' health; and 3) include comprehensive log reporting capabilities. Monitoring of Software shall include monitoring of databases, applications and processes in the system.	X	
	The MOMS complies with requirement TO-03 in the following manner: The system-monitoring component of the Sanef MOMS includes a secure web-based monitoring dashboard and monitoring services for end-to-end operations and maintenance of TCS hardware and software. The MOMS monitors the physical equipment as well as the communications and delivery of files and transactions. It provides real-time updates of the status of system components, and assigns priorities and actions to events as configured by administrators. The MOMS provides the functionality listed previously as follows: 1. The MOMS provides users with reports that detail the health and performance of the systems, including software and hardware; 2. The MOMS provides a role-based dashboard that depending upon the user's login provides a GUI that graphically depicts the health of the system, connectivity, database and application health and the status and any open work orders or alarms; 3. All TCS component logs are centralized to a dedicated logging server. In addition, alarms can be modified to apply thresholds for alerts to technicians and be individually prioritized based upon the type of failure and its potential impact to the system and its operations. The areas of monitoring include hardware, communications, applications, processes, and the database. The following diagram provides an overview of the system monitoring services and the integrated real-time monitoring dashboard within the Sanef MOMS:		

Req ID	Toll Operations Center (Section TO)	Required	Value Add
	[redacted]		
TO-04	The TSP shall provide and maintain the TCS by using the automated MOMS. The TCS shall provide system-generated maintenance job tickets, manually created job tickets, information indicating how the preventive maintenance work is scheduled in the System, information indicating how repair activity is logged, reported and resolved in the System.	X	
	Proposer Response: The MOMS complies with requirement TO-04 in the following manner: Sanef ITS will maintain and ensure availability of the TCS using the MOMS. The MOMS has two methods for creating fault related work orders: 1. The first method creates system-generated work orders (or job tickets) automatically: when a fault occurs, the system creates a work order and assigns it to the appropriate recipient. For maintenance that is periodic (occurring at regular intervals) or predictive (in which the system forecasts the need for maintenance, the MOMS will generate and assign these work orders automatically. These are created based upon previously defined schedules or when a device reaches some		

Req ID	Toll Operations Center (Section TO)		Required	Value Add
	equipment related MTBF or MTTR threshold; 2. The second method of work-order creation involves a user manually creating a work order. This user can be connected to the system from a workstation or remotely using an application on a mobile device to create the work order. Users can manually create any work order in the system for predictive or preventive maintenance related tasks as well. For all work orders the MOMS logs the timestamp of the following events: • Alarm or event that creates the initial order • Its assignment to a technician, DBA or developer • Response time when the work order was acknowledged • Any reassignment • Time to completion of the repair or resolution • Equipment used in the repair At right is an example of the work order screen: The work order screen is used to manually add a new work order, update an existing work order or view an existing work order. This data is used to produce the reports for response times, repair times, equipment and inventory statuses as well as to create purchase orders if equipment used in resolving the work order causes the inventory for that item to fall below a previously defined threshold. MTBF and MTTR reports as well as inventory purchase projection reports are included in the Sanef provided MOMS.	[redacted]		
TO-05	The MOMS shall monitor activities, provide alerts and generate tickets in real-time for all processes and unusual activity triggered by the System and System operators, including but not limited to: communication, Hardware, Software, and database failures.		X	
	The MOMS complies with requirement TO-05 in the following manner: The Sanef MOMS is constantly monitoring the TCS for hardware, software communications and database failures, as well as other issues such as low computer disk space, high rate of transactions without license plate numbers and low rate of transactions being reported by the roadside equipment. The MOMS receives data from all the sources capable of generating alarms to determine failures (and if it does not receive data in an expected timeframe, that itself generates a failure). The MOMS also monitors equipment, systems and database log files for failed events such as database inserts, duplicate messages, timeouts and others that would indicate a problem with the TCS. All of the alarms, systems, and events monitored by the MOMS can generate work orders for technicians. MOM's administrators also have the ability to apply filters and thresholds so that an event that is within predefined acceptable levels does not generate unnecessary work orders, and so that duplicate work orders for the same failure are not created.			
TO-06	The MOMS shall provide monitors and alerts, and shall calculate and generate tickets in real-time for all processes, including but not limited to: high number of image rejects in a lane, high number of Violations or image Traffic Transactions in a lane; threshold limits exceeded (e.g. Violations, class mismatch); and response times, repair times, and down time from the data entered by the maintenance staff and automatically generated by the TCS.		X	

Req ID	Toll Operations Center (Section TO)	Required	Value Add
	Proposer Response: The MOMS complies with requirement TO-06 in the following manner: The MOMS is a real-time event monitoring system that generates work orders (job tickets) and has configurable filters and thresholds that can be applied to messages being received from all component systems of the TCS: • The MOMS includes filters to prevent the creation of duplicate messages for the same event; • The MOMS applies thresholds to demine when to create an alarm message for events that have acceptable failure rates, including image loss, treadle failures, violations, class mismatches and others; • The MOMS generates work orders (job tickets) for events with filters or threshold only once the event has passed through the filter or exceeded the threshold. Events that the MOMS monitors include unusual system activity or low performance readings such as: • OCR Performance (OCR missing in the last configurable # of transactions, i.e., high number of image rejects in a lane); • AVC/Axle Counts (high rate if missing axle counts including class mismatch thresholds exceeded); • AVI (tag detection rate lower than expected, i.e., high number of violations or image traffic transactions in a lane, violations threshold exceeded); • High Number of Orphan Tag Reads (tag reads not associated with a vehicle); • Low Number of Transactions (outside the traffic norm for the time period); • Response Times (for any system component); • Repair Times (for any system component); • Downtimes (for any system component). Automated system monitoring reports provide performance trending as shown in the following sample report:		

Req ID	Toll Operations Center (Section TO)	Required	Value Add
	[redacted]		
	[redacted]		
TO-07	The Toll System Provider shall provide a MOMS that includes but is not limited to receiving and monitoring status messages of all System Hardware and Software and providing local trouble ticket manual entry or email entry by authorized users. The MOMS shall store data in a relational database to permit data recovery and flexibility in reporting via Ad-hoc reporting.	X	
	Proposer Response: The MOMS complies with requirement TO-07 in the following manner: The MOMS continuously monitors the hardware, software applications, communications and database of the TCS to log failures and apply the rules for thresholds and filters in the generation of work orders. Only authorized users can access advanced features such as the creation of trouble tickets. Users are given roles and once their login is authenticated they then have		

Req ID	Toll Operations Center (Section TO)	Required	Value Add
	access to the functions of the MOMS that are granted to that user role. Such functions include manual work order generation and on demand or ad-hoc report generation. The MOMS stores all its information in the latest version of Microsoft SQL server, a well-established relational database, thus supporting data recovery and flexible reporting. The MOMS monitors status message of all system Hardware and Software. All events and messages that are received by the MOMS are recoded in the database and used to create pre-designed and ad-hoc reports, track inventory, and for the creation of work orders (trouble tickets). At right is an example of the Work Order List report screen: The Work Order List report screen shows a detailed listing of all work orders recorded in MOMS. The information for each work order can be viewed and updated in the work order screen (example shown above in TO-04). The work order screen can also be used to manually create new work orders. [redacted]		
TO-08	The Toll System Provider shall report and log all maintenance activities into the MOMS. The Toll System Provider shall document all information and issues related to a failure condition including all actions taken to complete the correction into the MOMS.	X	
	Proposer Response: The MOMS complies with requirement TO-08 in the following manner: The MOMS logs all maintenance activities, but the process generally starts with a failure or event. The MOMS automatically logs all of the system failures and events, including a “maintenance necessary” event, to the database without user input or intervention. The MOMS also permits that authorized users manually report failures or events. The MOMS clearly identifies if an event or alarm was system or user generated and if it user generated, the user, date and time are part of the database record. Once the work order has been generated, the MOMS logs all of the steps undertaken necessary to complete the repair (all corrective actions) through the closure of the work order.		
TO-09	The Toll System Provider’s maintenance staff shall have real-time access to the MOMS, and the Toll System Provider shall establish and maintain all the required connections to ensure that the maintenance staff has remote access. Maintenance staff shall be trained in the use of the MOMS.	X	
	Proposer Response: The MOMS complies with requirement TO-09 in the following manner: All of our employees authorized to use the MOMS have access to it at all times. The maintenance staff will have access to the MOMS dashboard, as required in TO-03, and other functions via workstations connected through the LAN or WAN network segments. MOM’s technicians can also connect to the MOMS using remote devices such as tablet computers and smartphones.		

Req ID	Toll Operations Center (Section TO)	Required	Value Add
	Sanef ITS thoroughly trains all maintenance staff on use of the MOMS. Sanef company policy is for several of the technicians employed to install, test and deliver the TCS to remain with the project to maintain it for the operations and maintenance portions of the contract. These technicians receive hands on training with the entire system during its installation and implementation. Before the system becomes operational, the MOMS user training is performed by our training staff, who themselves have extensive experience with the MOMS on existing Sanef installations. The maintenance staff will then enter the equipment inventory into the system and begin using the MOMS to tune and improve the TCS once installed. When new technicians are hired existing staff will train the new hires and provide both written training materials and hands on field instructions. Sanef employs operations and maintenance staff on three continents which can be called on by the dedicated LISORB project staff 24 hours a day when additional support is needed such as the occurrence of a significant maintenance event.		
TO-010	The Toll System Provider shall enter and update in MOMS all incidents within 4 hours of the incident. The MOMS shall report all updates.	X	
	Proposer Response: The MOMS complies with requirement TO-10 in the following manner: The MOMS will be configured so that all incidents are tracked and updated within 4 hours. Any updates to incidents are tracked entirely within the MOMS, and all updates will be reported by the MOMS in accordance with the rules set forth for the incident type.		
TO-011	It is desired the Toll System Provider provide a MOMS that accepts trouble tickets using mobile applications that can be used by technicians to enter information.		X
	Proposer Response: The MOMS complies with requirement TO-11 in the following manner: The MOMS accepts trouble tickets created from mobile applications. The MOMS user has the ability to remotely create trouble tickets from mobile devices. The technician can also update and resolve these tickets remotely. Below is an example of the work order screen shown on a smartphone:		

Req ID	Toll Operations Center (Section TO)	Required	Value Add
	[redacted] The technician is able to view and update work orders using the mobile MOMS application on a smartphone. A technician can also manually create a new work order using their mobile device.		
TO-012	The MOMS shall record all configuration data, and log and retain that data in configuration control after each System component change, including deployment of system patches, backup, archival, data restoration, disaster recovery data transfer and synchronization.	X	
	Proposer Response: The MOMS complies with requirement TO-12 in the following manner: The MOMS maintains configuration data for alarms and messages. Furthermore, the MOMS stores configuration information including versions and parameters for all Firmware, and Hardware in the system: when equipment is added to the MOMS inventory its version and other details are entered by the IT or maintenance technician performing the installation. The configuration data can be updated if any data entry error is discovered. Software version control however for lane software, applications and databases is not currently maintained in the MOMS, but shall be added to our current MOMS to meet the requirements of this project. Currently, this information is available through our QA process, which involves reporting for software testing, validation and installation. This is centralized with the QA department in order to ensure that all the files and libraries that go into a software build are correct before the version is released.		
TO-013	MOMS shall calculate response times, repair times, and down time from the data entered by the maintenance staff and automatically generated by the System and shall provide role-based security.	X	
	Proposer Response: The MOMS complies with requirement TO-13 in the following manner:		

Req ID	Toll Operations Center (Section TO)	Required	Value Add
	The MOMS maintains all critical time attributes needed for calculating and reporting about response times, repair times and down time. The MOMS calculates the response, repair and down time for all failures and repair work. This data is then used to generate MOMS reports, which help the supervisors to manage the TCS and the technical staff. These reports also serve to demonstrate if the TCS is being maintained within the terms of the contract, as well as to improve the level of service provided under the contract. The MOMS supports role-based security, including for data entered by maintenance staff to support response, repair, and down time calculations. This diagram provides an overview of the time attributes tracked by MOMS: [redacted]		
TO-014	All preventive maintenance shall be scheduled through the MOMS and automatic work orders shall be generated at the scheduled times.	X	
	Proposer Response: The MOMS complies with requirement TO-14 in the following manner: The Sanef maintenance staff will use the MOMS to manage ***all*** scheduled maintenance for the TCS. The MOMS will generate ***all*** the work orders for scheduled maintenance, this permits that the supervisor has ample insight into the work to be performed so that staff can be properly allocated.		
TO-015	The MOMS system shall track all system Hardware and Software elements from purchase to their disposal. These include but are not limited to: 1) All system Hardware and Software items, locations and versions; 2) All maintenance and service agreements; 3) A list of suppliers from whom products were procured, original purchase order numbers, Supplier numbers and reference numbers; 4) All warranty information for the individual item; 5) Alerts prior to warranty expiration; and 6) Automatic alerts for Spare Parts levels.	X	
	Proposer Response: The MOMS complies with requirement TO-15 in the following manner: The MOMS allows for the management of all hardware and third party software delivered and used in the TCS, this includes the following: 1. The MOMS permits that all equipment and third party software information and location is stored, tracked, and maintained by the users; 2. The MOMS allows for warranty/maintenance and service information such as vendor, expiration and contact data being stored at the equipment type and unit levels; 3. The MOMS maintains vendor contact information and purchase history allowing the user to quickly identify vendors, equipment purchased and warranty status; 4. Warranty information is available at both the equipment type and unit levels and is maintained by the user, reports provide information about what equipment is in and out of warranty. The whereabouts of warranty information and documentation is stored in the MOMS and is included in the reports; 5. The MOMS user can run reports where items that are nearing warranty expiration are represented, this timeframe can 30, 60 or 90 days of warranty expiration. The MOMS can be configured to signal an alarm message when the warrantee nears expiration or expires; 6. The MOMS monitors inventory levels for equipment type, and once the level has dropped below a configurable threshold, an alarm is generated. There is also a low inventory report that identifies items that have fallen below the threshold. All activity involving the hardware and third party software inventory in the MOMS is tracked where the history of each item, from purchase to disposal, is available. The following screen shot provides an overview of the asset management features of the Sanef MOMS:		

Req ID	Toll Operations Center (Section TO)	Required	Value Add
	[redacted]		
TO-016	The MOMS shall automatically generate reports demonstrating performance, exceptions, availability, and compliance to Performance Requirements (if applicable) for the System and all of its components such as the IVR and Customer Website. MOMS daily, weekly and monthly reports shall be available on-demand.	X	
	Proposer Response: The MOMS complies with requirement TO-16 in the following manner: The reporting infrastructure of MOMS provides all the information needed for checking performance, exceptions, availability, and compliance to the performance requirements for the TCS and all of its components. The MOMS can be configured to generate these reports on a daily, weekly and monthly basis or on-demand. Below is an example of the Device Critical Time Attributes report screen: The Device Critical Time Attributes Report provides MTTR and MTBF calculated values per equipment part present in MOMS. See the response to TO-19 below for a list of MOMS reports and how they are used to measure the performance of the TCS. [redacted]		

Req ID	Toll Operations Center (Section TO)	Required	Value Add
TO-017	Toll System Provider shall include the Maintenance and Support Plan for the Joint Board's approval that demonstrates serviceability of components and the overall system, with attention to how performance metrics will be tracked and reported to the Joint Board. The Maintenance and Support Plan shall illustrate how the proposed structure and position of equipment provides optimum ease of service and maintenance during lane closures, and ease of access during regular maintenance.	X	
	Note: The Proposer shall include in this Technical Response Form detailed descriptions of how it will service the System components, including but not limited to 1) camera cleaning and lighting replacement; 2) remote and on-site equipment calibration and tuning; 4) Hardware replacement during live operations; and 4) remote Software upgrades and maintenance including patch management. **Proposer Response:** The MOMS complies with requirement TO-17 in the following manner: Sanef ITS will prepare comprehensive maintenance and support plan for the project that will during the design phase be presented to the Joint Board for approval. The plan will explain how the MOMS is used by the staff responsible for ensuring that the TCS functions reliably with a high level of availability and performance within or exceeding the service level requirements of the contract. The plan will demonstrate how the equipment selected and its positioning is optimized to make the routine and unscheduled maintenance work efficient and minimize the time associated with repair and lane closure. Sanef ITS maintains its roadside equipment with a replace and repair approach where faulty equipment is first replaced then repaired after replacement and placed into available inventory, which is a key factor in reducing the downtime and repair times for the roadside system as a whole. The plan will illustrate how the Sanef approach keeps lane closures to a bare minimum, and those can occur during off-hours except when unexpected problems arise; and that Sanef equipment is easily accessible for regular maintenance. The maintenance and support plan will also explain how the MOMS reports will be used to demonstrate to the Joint Board the health of the system and that it is meeting the performance requirements of the contract. These reports will be prepared monthly and presented to the Joint Board's representatives. These are examples of how some aspects of the roadside equipment will be maintained by the Sanef ITS technicians: 1. The overhead equipment, including cameras and lighting, will be installed on a single gantry for each direction of traffic. The lights and cameras will undergo routine maintenance during off hours where a lane closure can be scheduled and not impact lane operations. The lights used in at the roadside will be LED's which provide the longest time between replacement. Both the cameras and the lights will require periodic cleaning as part of their routine maintenance. This lane closure will be performed once a month utilizing barrier and bucket trucks. The DMS's at the facility will advise motorists in advance of the lane closures with the information regarding date and times. On the day of the lane closure the DMS's will also advise motorists of the lane closures; 2. The RFID (tag reader) antennas will be tuned prior to the opening of the facility but may require additional calibration and tuning after the system has settled in. An antenna power and channel adjustment is made remotely through a networked application and typically does not require any form of lane closure. In the event that the antennas themselves need to be physically adjusted for angle then the previous lane closure procedures will be used and the antennas will be realigned. Other equipment such as smart loops also is tuned remotely. The goal of all such tuning is to improve the performance of the equipment of subsystem. Tuning requires the measurement of the device or system performance before and after the tuning effort. Sanef staff will run these performance reports to fine tune the system and make any adjustments or calibrations necessary to maximize the performance of the equipment; 3. The precise process for the replacement of hardware during live operations depends upon the equipment that needs replacement, and specifically whether it requires a lane closure. For example: lane controllers operate in a redundant manner and are installed within an equipment cabinet. Should a lane controller fail, the technician can address the failure and make the repair without needing to close a lane. On the other hand, an antenna failure requires the closure of a lane for its replacement. The replacement (and requisite lane closure0 may be able to be delayed until traffic has reached off peak levels. The license plate cameras would provide for accounts to be identified by the registered license plate on file in the system using the OCR and manual image review processes while the antenna is not functioning; 4. Software upgrades and patches are always performed remotely with on-site staff present to support the remote work being performed. Our TCS supports remote upgrades for all system components.		

Req ID	Toll Operations Center (Section TO)	Required	Value Add
TO-018	Toll System Provider shall provide monitoring services with a secure web-based real-time monitoring system to monitor and report the status of all System components.	X	
	Note: The Proposer shall clearly provide in this Technical Response Form examples of how its existing MOMS system detects changes and anomalies and how this information is reported from the TCS. **Proposer Response:** The MOMS complies with requirement TO-18 in the following manner: The Sanef MOMS is a real-time module that allows users to remotely monitor the system using two different methods for secure remote connectivity. The first method is via SSL through a browser-based interface, the second Method is through Cisco VPN services for client server type applications. The MOMS covers the status of all system components. Two examples of how the MOMS is capable of identifying changes and anomalies in the TCS is in how it works with threshold failures and alarms follow: • The first example is a threshold failure that might be caused by misclassifications. If the transaction intake service identifies a vehicle class conflict (class associated with account vs. actually measured Class), the transaction intake service sends and alarm to the MOMS. The MOMS keeps track of this event but does not immediately create a work order. Once a threshold number of class conflict alarms are reported within a certain number of valid transactions, the MOMS generates an alarm that is displayed on the dashboard and creates the work order; • The second example is lane alarms. The roadside continuously sends equipment status messages to the MOMS; an alarm-processing engine within the MOMS then de-bounces these messages and observes their state. Any change in state is declared by the MOMS, which generates the appropriate alarms and work orders. Alarms are triggered only when the status of a device changes. There are two types of status changes which cause alarms to be triggered: • Recovery to failure - Triggers a Failure alarm; • Failure to Recovery - Triggers a Recovery alarm. Technicians receive only one alarm notification for each failure (for example, by text message or e-mail). The MOMS Toll Point Supervision (MOMS-TPS) application continuously monitors the status of Gantry Controllers and their associated peripherals. The status of Gantry Controllers is displayed on a screen in MOMS-TPS. The following screen shot shows the MOMS real-time monitoring application: [redacted]		
TO-019	The TCS shall provide reports that provide trouble ticket detailed and summary status for Hardware and Software processes for the TCS and any external or internal interfaces. The standardized MOMS reports have been listed in this section of the proposal form.	X	
	Note: The Proposer shall provide in this Technical Response Form a list of its existing suite of standardized reports for MOMS along with a brief description of each one as to its purpose and how it is used for monitoring the health of the System and performance in the field.		

Req ID	Toll Operations Center (Section TO)	Required	Value Add
	Proposer Response: The MOMS complies with requirement TO-19 in the following manner: The TCS generates reports that include work order (trouble ticket) detailed and summary status for hardware and software processes for the TCS as well as external and internal interfaces to the TCS. Authorized users to run on demand and have selection criteria such as daily, weekly, and monthly, can generate all MOM's reports. Some reports can also be scheduled to run at future times. Current existing standardized MOMS reports are as follows: M01 – Manufacturer List Report: The Manufacturer List Report provides a complete list of all Manufacturers entered in MOMS along with all available contact information; M02 – Vendor List Report: The Vendor List Report provides a list of all Vendors entered in the MOMS along with all available contact information; M03 – Equipment List Report: The Equipment List Report provides a high level list of all Equipment entered in the MOMS. The Equipment List Report is shown below; including its selection criteria which become enabled when this report gets selected on the tree view; M04 – Equipment Parts Report: The Equipment Parts Report provides a detailed level list of all Equipment Parts tracked in MOMS with all the available properties; M05 – Events Report: The Events Report provides a detailed event history of the system; M06 – System Critical Time Attributes Report: The System Critical Time Attributes Report provides the MTTR calculated values for the sub-systems in MOMS; M07 – Device Critical Time Attributes Report: The Device Critical Time Attributes Report provides MTTR and MTBF calculated values for each equipment part in MOMS; M08 – Service Critical Time Attributes Report: The Service Critical Time Attributes Report provides all entered or calculated time attributes in regard to every closed work order recorded in MOMS; M09 – Work Order List Report: The Work Order List Report provides a detailed listing of all work orders recorded in the MOMS; M10 – Work Order Activity Details Report: The work order Activity Details Report provides detailed activities for all work orders recorded in MOMS; M11 – Part Utilization Report: The Part Utilization Report provides detailed information about Parts involved in work orders recorded in the MOMS; M12 – Alarm Summary Report: The following is a sample Alarm Summary Report. This report shows the quantity of alarm occurrences by location. [redacted] **The following screen shot shows the open work order screens in the MOMS application:**		

Req ID	Toll Operations Center (Section TO)		Required	Value Add
	[redacted]			

Req ID	Toll Operations Center (Section TO)	Required	Value Add
TO-020	It is desired the Toll System Provider provide to authorized users operational, management and performance MOMS reports (on-demand, ad-hoc, daily, monthly) that include but are not limited to: • Exceptions report summarizing all unusual or significant occurrences during the period and all items that are not processing correctly or are stuck in the System • Trend analysis for repetitive failure • Equipment versions, Software versions, firmware versions and serial numbers for all equipment installed as part of the TCS • Disaster recover data transfer and synchronization • Detailed list of parts replaced as a result of maintenance actions, with an identification of warranty versus non-warranty replacement • Status of spare parts inventory • Staffing report detailing positions, staff hours worked and performance; and • Other reports available to operate and maintain the system.		X
	Proposer Response: The MOMS complies with requirement TO-20 in the following manner: Authorized users of the MOMS have the ability, based on their role, to run various types of reports that are used in the daily operation of the TCS. These packaged reports provide the user with selection criteria for locations, date ranges, equipment types and others. Ad-hoc reporting is done by using SQL Server Reporting Services (SSRS) and Report Builder . The MOMS creates the following types of reports: • Equipment failure trend report that identifies equipment that is failing to meet its MTBF or that has been the cause of multiple work orders and repaired; • Equipment inventory report provides software version, firmware version and serial number information for all equipment installed as part of the TCS; • Transaction report that identifies missing transactions based on sequential transaction ID numbers; • Equipment inventory report identifies the number of times the equipment has been installed, its warranty status and location; • Equipment inventory report identifies if the item is being used, listed as spare, out for warranty service or disposed; • On call staffing report has detailed information for technicians, their position, and contact information and hours scheduled. The technician performance report provides information regarding technician average response and repair times. This report is used to improve service and identify any factors that may be negatively impacting the overall service that is being provided under the maintenance contract. To make sure this information is never lost a disaster recovery plan shall be provided that includes: • Full and incremental tape backups performed on a daily basis; • Offsite storage of tapes; • Mirror locations were all system data is replicated to.		
TO-021	It is desired that the MOMS system monitor Software processes including but not limited to cron jobs, operating system services, application processes, database management metrics such as available memory in cache and other critical performance areas in the System.		X
	Proposer Response: The MOMS complies with requirement TO-21 in the following manner: Sanef network administrators, DBA's and technicians each use the best-of-breed commercial off-the-shelf (COTS) operating system (Windows Server 2012 R2) and database tools to monitor jobs, operating system services, application processes, database management metrics and other critical performance areas of the TCS. All Sanef staff is trained to use the necessary third party tools to ensure that the system is being maintained in the best possible manner. The scheduling of these functions such as defragmentation, reviewing logs and others is maintained in the MOMS with the work orders being created and managed from within the MOMS.		
TO-022	The Toll System Provider shall provide storage space for all Spare Parts. The Toll System Provider shall be responsible for the inventory of all Spare Parts at a Toll System Provider-provided Warehouse Facility that is within 10 miles of one of the Walk-up Centers and co-located if feasible. The Toll System Provider shall provide a Warehouse Facility to store all Spare Parts and equipment and serve as the maintenance depot. The Toll System Provider shall account for all Spare Parts and shall provide safeguards against theft, damage, or loss of the Spare Parts. The Toll System Provider shall ensure that only Spare Parts and equipment required to service the Project are stored at the Warehouse Facility and that such stored Spare Parts and equipment	X	

Req ID	Toll Operations Center (Section TO)	Required	Value Add
	shall only be used for the Project.		
	Note: The Joint Board shall have final approval of the location of the Warehouse Facility. The Toll System Provider shall obtain and maintain a lease for the necessary Warehouse Facility, subject to the Joint Board's approval. **Proposer Response:** The TCS complies with requirement TO-22 in the following manner: Sanef will as part of the contract secures a lease for a warehouse facility that meets the requirements of the RFP for the storage of spare parts. The spare parts will be kept in a secure space with the appropriate access controls and video surveillance to guard against theft or damage. The MOMS will be used to identify all of the equipment that is being kept at the facility regardless if it is for spare parts, repair service or awaiting destruction and disposal. The MOMS system will make available the spare parts equipment reports that will identify the location, status and condition of the equipment stored at the facility. The spare parts present at the facility will only be those that have been purchased for the project. We will attempt to co-locate the warehouse facility with one of the walk-up centers, but in any case will locate a warehouse facility within 10 miles of one of the walk-up centers. We will obtain a preliminary lease for the warehouse facility but will not sign a final lease until we have the Joint Board's approval for the location.		
TO-023	The Toll System Provider shall maintain an adequate Spare Parts inventory as specified in the Agreement. The Toll System Provider shall identify the existing spares for the Roadside System and propose the quantity needed to maintain the required performance. The Toll System Provider shall make available all necessary test and warranty repair resources for replacement including test repair and warranty repair, spare modules and spare components to support availability of the TCS in accordance with the Performance Requirements. The Joint Boar reserves the right to purchase any and all Hardware for the Project from the Supplier directly. The Toll System Provider shall recommend and periodically update a Spare Parts Inventory Plan identifying the quantity to be maintained in order to support the Project, its Roadside System, BOS, and CSC Revenue Service.	X	
	Proposer Response: The MOMS complies with requirement TO-23 in the following manner: The bill of materials and spare parts listed in this proposal has identified to the unit level the equipment that will be maintained as spare parts for this project. The list of equipment will be imported into the MOMS prior to the commencement of operations and the equipment replenishment thresholds set at that time. These thresholds will be used to identify when spare equipment levels have reached a point where additional quantities need to be ordered. Sanef has documented testing procedures in its maintenance manuals and in the technician training materials. This material includes information regarding the warranty and repair of the system. These will be made available to the Joint Board for their review and use in the event that the Joint Board should decide to purchase or manage inventory directly. Sanef annually reviews and updates our spare parts inventory plan, including the quantity to be maintained in order to support the Project, its Roadside System, BOS, and CSC Revenue Service. Typically the low inventory thresholds are adjusted so that as the system ages and spare parts become more difficult to source adequate lead-time is allowed to procure spares. The spare parts inventory plan addresses the entire TCS.		
TO-024	Spare Parts Inventory and Tracking: The Toll System Provider shall monitor the inventory quantity and ensure that the inventory is maintained to the levels required in the Agreement. The Toll System Provider shall keep accurate records of all Spare Parts entering and leaving inventory including but not limited to: the time and date the Spare Part was dispensed, and the location within the Project to which the Spare Part was dispatched and used. The Toll System Provider shall track of all warranty replacement through a returned materials authorization (RMA) process. If the replaced part is under warranty, the part shall be immediately replaced with a new part. If the replaced part is out of warranty, the Toll System Provider shall make every effort to repair the replaced item to a usable status and place the part back into the Spare Parts inventory. If the part is unable to be repaired, a new part shall be purchased and placed into the Spare Parts inventory. The details of the repair efforts including problem, status, inventory, and repair disposition shall be included in the MOMS inventory and repair database.	X	
	Proposer Response: The MOMS complies with requirement TO-24 in the following manner: The MOMS inventory will be used to monitor spare parts quantities so that the levels are sufficient to ensure that the TCS can be properly maintained in accordance with the service levels required of the contract. The MOMS will keep the records for all equipment ordered and received; these will be managed and monitored at the unit level using serial number information when possible. The MOMS maintains records based on location installed, date and time for all the equipment that is deployed and in use by the TCS, as well as the equipment that is kept at the		

Req ID	Toll Operations Center (Section TO)	Required	Value Add
	maintenance facility as spare parts. The MOMS tracks the warranty status of all equipment in the TCS. When equipment is in need of repair and is eligible for warranty service, we will immediately replace it with a new part, and the MOMS can track this service repair through the RMA process and then once repaired the equipment can be returned to the field or placed into inventory for future use. If the equipment is not eligible for warranty repair then the Sanef staff will evaluate if the repairs can be performed in house by our technicians or if needs to be sent to the manufacturer for repair work. Based on this assessment the item will be repaired by Sanef technicians, sent to the manufacture for repair, or destroyed. If a part that is out of warranty cannot be repaired, we will purchase a new part. We will include all details of repair efforts, including problem, status, inventory, and repair disposition shall be included in the MOMS inventory and repair database.		
TO-025	Procurement and Control of Spare Parts: Thirty (30) days prior to the first Tolling Readiness Deadline, the Toll System Provider shall purchase and have on-hand the agreed upon inventory of Spare Parts. The facility and storage area shall be secured and connected to an up-to-date security network system with alarm notification provided to the Maintenance staff. The Joint Board shall have full and unrestricted access to the Maintenance and/or storage facility. Any Spare Parts that are lost or damaged due to the negligence, intentional act, or omission of the Toll System Provider or its employees, subcontractors, agents, or invitees shall be replaced by the Toll System Provider at its sole cost. The Toll System Provider shall deliver all Spare Parts to the Warehouse Facility. After the Warranty Period the Joint Board shall reserve the right to purchase all Spare Parts directly from the Supplier and all purchases will be coordinated through a process recommended by the Joint Board at that time. After the Warranty Period, the Toll System Provider-provided Spare Parts not purchased directly by the Joint Board shall be provided at cost, shall not include any mark up, and shall be in accordance with the prices as specified in the Agreement.	X	
	Proposer Response: The MOMS complies with requirement TO-25 in the following manner: Sanef will stock the maintenance facility with spare parts and input the equipment list into the MOMS at least 30 days prior to the toll readiness deadline. The facility will be secured prior to the arrival of equipment with an alarm system, fire sprinklers, CCTV, and network connectivity to the MOMS. All security-relevant alarms will notify the maintenance staff. The Joint Board will be provided full and unrestricted access to the facility for inspection. Sanef will be responsible for the equipment delivered to the warehouse facility, including spare parts that are lost, damaged, or otherwise unavailable, as part of the contract. Sanef acknowledges that the Joint Board reserves the right to purchase spare parts directly from suppliers. If the Joint Board chooses not to purchase spare parts directly from suppliers, Sanef will make the spare parts available to the Joint Board at no markup and in accordance with the prices specified in the contract after the warranty period.		
TO-026	The Toll System Provider shall provide Spare Parts adequate to support operations of the TCS and shall provide a sample inventory list of Spare Parts for the Project for its successful operation to ensure no degradation of service to the Project or customers.	X	
	Note: The Proposer shall include in this Technical Response Form a list of all Major Spare Parts of the System that will be used to maintain the System. A sample list of the types of Major Spare Parts is listed below: **Proposer Response:** The TSP complies with TO-026. The Roadside System shall be provided with the following Major Spare Parts: **Roadside Controller and In-lane Electronics:** Roadside Controller Computer, Network Switches, Ethernet I/O Controller, Environmental Sensor (IP based) **AVI System:** Redundant Reader, Lane Kit (Incl. Antenna, RF Module), Tuning **AVDC System:** Laser Scanner, Power Cable, Ethernet Cable, Power Supply, Laser Scanner, Loop Detector (4 Ch Rackmount), Loop Controller, Power Supply (Loop Controller) **VES:** VES Server, VES Camera (Front / Rear Plate), VES Illuminator, VES Camera Power Supply, Overview Camera, Overview Camera Power Supply **CCTV:** CCTV Server, CCTV Camera, CCTV Camera Power Supply, Network Switches **BOS and CSC:** The IT Environment is virtualized and configured with redundant network & SAN switches, as well as redundancy for all Physical Hosts and SAN's. All hardware shall be provided with 24/7/4 coverage so that any failed hardware is replaced within 4-8 hours. The environment is a cluster configuration, so that if there is a hardware failure on one host, the VM's will migrate over to another available physical host. This reduces the need to have spare parts stored on site. Also, in the event of hardware failure, the systems send out alerts via email to Sanef IT Staff, who in turn contact the hardware vendor and schedule replacements to be delivered on site Same Business Day. The list of Major Spare Parts for the physical host servers, SAN and networking equipment shall include: Hard Drives for the SAN, Hard Drives for physical host servers, Power Supply for SAN, Power Supply for physical host servers, Switching hardware, Network Switch, and SAN Switch		

Req ID	Toll Operations Center (Section TO)	Required	Value Add

Operations and Maintenance Requirements

Req ID	Operations and Maintenance (Section OM)	Required	Value Add
	Warranty		
OM-001	The Roadside System Hardware and Software warranty shall be 1 year from the Revenue Service Date for each Bridge.	X	
	Note: The Roadside System warranty start and end dates will have staggered start and end dates if the Revenue Service Dates differ for each Bridge. **Proposer Response:** The TCS Complies with requirement OM-001. Sanef warranties the Roadside System Hardware and Software for one year, from the date of revenue service, for the hardware and software installed on each bridge.		
OM-002	The BOS and all associated interfaces Hardware and Software warranties shall be a minimum of 3 years from the commencement of Revenue Service for the first Toll Zone.	X	
	Note: For purposes of this requirement, the BOS shall include the account management system, transactions system, reporting system, MOMS, external systems provided and any systems required by the Toll Operations Center, and CSC and Walk-up Centers. **Proposer Response:** The TCS Complies with requirement OM-002. Sanef warranties the BOS hardware and software for 3 years from the commencement of revenue service on the first bridge to go into revenue service. For this requirement, we understand the BOS to include the account management system, transactions system, reporting system, MOMS, external systems provided and any IT systems required by the Toll Operations Center, and CSC and Walk-up Centers.		
OM-003	The Toll System Provider shall provide all labor, parts and materials to keep the System performing in accordance to the Performance Requirements.	X	
	Proposer Response: The TCS Complies with requirement OM-003. For the duration of this contract, Sanef will provide labor, parts, and other materials to keep the system operating in accordance with the Performance Requirements. We will use the maintenance scheduling system of our MOMS software to perform regular maintenance to keep the system in good working order. The following screenshot shows the Equipment Preventive Maintenance Schedule Information Board providing an overview of the recurrence time, recurrence pattern, and the task details and to whom it is assigned. [redacted]		
OM-004	The TCS Software Warranty shall cover all defects and failures.	X	
	Proposer Response: The TCS Complies with requirement OM-004. The TCS software Warranty covers all defects and failures in the TCS software. However, we presume that warranty-related software failures of ETC Contractor components (e.g., the toll tag reader) will be covered by the ETC Contractor.		
OM-005	The Toll System Provider shall modify Software and configurations as necessary to maintain and support the TCS in the normal course of business. Toll System Provider shall provide any and all version changes, parameter changes and changes that improve the Toll System Provider's ability to maintain and support the TCS at no additional cost to the Joint Board.	X	
	Proposer Response: The TCS Complies with requirement OM-005. We will update TCS software and configurations as necessary to support the TCS in the normal course of business. In particular, we will keep all security-relevant software up-to-date; we will update third-party software when new releases are available and		

	beneficial; and we will update our own software when bugs are fixed or performance improvements are possible. We will also update parameters of existing software as needed to continue or improve business operations. We will provide all these updates at no cost to the Joint Board. We presume that software that runs on the ETCS components (the toll tag reader) will be updated by the ETCS provider as needed. We will store and track software and hardware configurations with the configuration management tool of our MOMS software.		
OM-006	All warranty information shall be tracked and notification of expiration sent out to distribution list approved by the Joint Board. The warranty provisions shall be tracked for Major Spare Parts and Components excluding consumables.	X	
	Note: It is not necessary to track consumables. **Proposer Response:** The TCS complies with requirement OM-006. Our MOMs software tracks warranty information of all the software and hardware we provide, including major spare parts and components. We will discuss the best way to report notifications of warranty expiration to the Joint board when we discuss business rules (e.g., reporting impending warranty expirations in the monthly report; and real-time warranty expiration emails only to those individuals who request it). Then, we will report warranty expirations as agreed with the Joint Board.		
OM-007	The Toll System Provider shall maintain warranty records, review Software and Hardware discrepancies and make available patch management reports to demonstrate Software compliance with the warranty.	X	
	Proposer Response: The TCS complies with requirement OM-007. Our MOMS system maintains warranty records, and in addition provides a full set of Configuration Management tools, which allow us to review any possible software and/or hardware incompatibilities. We will create software patches where necessary, and if requested by the Joint Board can make Patch Management reports available to the Joint Board to demonstrate Warranty Compliance.		
OM-008	The Toll System Provider shall conduct a System Certification Audit at the start of the third full year after the Revenue Service Date of the last Bridge that will include a compliance audit of all Hardware and Software including operating systems, databases and applications that demonstrates that all Software and Hardware meets a configuration audit and test that demonstrates that the System complies with all Performance Requirements. Any variances shall be reported along with a corrective action plan.	X	
	Note: The Joint Board may conduct its own certification and audit at any time. TSP shall cooperate with and assist the Joint Board in any such audit. **Proposer Response:** The TCS complies with requirement OM-008. Two years after the final bridge comes into revenue service (i.e., the start of the third year), we will conduct our own System Certification Audit, in which we audit all our own software and hardware, including operating systems, databases, and applications, to demonstrate that the configuration is fully functional as defined in these requirements and in compliance with Performance Requirements. A special engineering team will create test plans and use a fleet of test vehicles, create new test user accounts, and take all actions necessary to exercise all the requirements. If we note variances during the audit, we will document them in a System Certification Audit report, create a corrective action plan, and report it to the Joint Board.		
OM-009	The Toll System Provider shall plan, implement and remove 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 Roadside System for the state where the lane closure will occur. The Toll System Provider shall request lane closures in writing and in accordance with the applicable state policy. Any preventative maintenance lane closures shall 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.	X	
	Note: The Proposer shall include in the Price Proposal a unit price for each of the traffic control configurations outlined in the TCS. The States' Parties will reimburse the Toll System Provider for each lane closure required during installation and during maintenance of traffic. **Proposer Response:** The TCS complies with requirement OM-009. We will plan, execute, and clear lane closures for maintenance in accordance with state traffic control plans and standards. We will request lane closures in writing in accordance with the policy of the state in which they will occur. We will make such requests 14 calendar days in advance or more for scheduled maintenance, or 12 hours in advance for emergencies. Our subcontractor Arrow electric has clearance with both the Kentucky Transportation Cabinet and the Indiana DOT to close lanes, and have the appropriate vehicles with safety lights, as well as the cones and other equipment needed to close lanes. They have extensive experience doing so, and they will follow good traffic management procedures to close lanes. If we become aware of unplanned lane closures we will notify the contact person at the Joint Board immediately by phone and/or e-mail. Unit prices for traffic control configurations are included in the price proposal.		
OM-010	The Toll System Provider shall log any lane closures including incidents reported by the Roadside System into MOMS. Any unusual circumstances shall also be noted in the incident report. If the information can be tracked and reported separately in MOMS, MOMS may be used to log incidents. A lane closure report shall identify who closed the lanes, start and end time of the closure, lane numbers closed and any comments or unusual events regarding the lane closure. If the lane	X	

	closure was conducted by the Toll System Provider, a reason for the lane closure shall be included in the report. Any lane closures that occur within the Toll Zone area, defined as 1000 feet on either side of the Toll Zone, shall be reported to the States' Parties on a monthly basis.		
	Note: This information is required so that the States' Parties or their agents can confirm the TSP accurately reconciles and identifies anomalies in traffic or revenue with these special events, and to reconcile any Customer Statements sent by the Toll System Provider for reimbursement. **Proposer Response:** The TCS complies with requirement OM-010. Our MOMS will log any lane closures, including those reported by roadside hardware. Incident reports will be created for every lane closure, and any unusual circumstances, including the cause for unexpected lane closures, will be recorded in the incident report. The reports will identify which person or parties closed the lanes, start and end times of closures, number of lanes closed, and records of unusual events, if they occur. The report will include a reason for the lane closure, whenever we are the party initiating the closure. All lane closures will be performed by our subcontractor Arrow electric, who is qualified, equipped, and certified to do so. Our monthly O&M report will include a list of lane closures that occurred in the preceding month in the toll zones.		

Performance Requirements

Req ID	Performance Requirements (Section PR)	Required	Value Add
	Roadside System		
PR-001	Roadside System shall be available 99.5% of the time.	X	
	Notes: Compliance with availability requirements will be separately calculated and applied to each Equipment Lane for a Tool Zone as provided in Exhibit N. Available lanes are those with all of their components properly functioning - available to collect revenue and sending all Traffic Transactions and images to the BOS, as more particularly defined in Exhibit N. This 99.5% availability requirement excludes approved maintenance closures. This requirement will be evaluated for compliance on a monthly basis. **Proposer Response:** [redacted]		
PR-002	The Roadside System shall be fully capable of reading and processing a minimum of 1,200 images per camera per Equipment Lane per hour.	X	
	Note: This requirement will be evaluated by the Joint Board for compliance on a monthly basis. **Proposer Response:** [redacted]		
PR-003	The Tool System Provider shall be fully capable of processing all license plate numbers including stacked letters.	X	
	Note: This requirement will be evaluated by the Joint Board for compliance on a monthly basis. **Proposer Response:** [redacted]		
PR-004			X
	[Intentionally not used].		
PR-005	The Roadside System shall process and create Traffic Transactions for a minimum of one vehicle per second per equipment lane for fifteen (15) seconds at each Tool Zone.	X	
	Note: This requirement will be evaluated by the Joint Board for compliance on a monthly basis. **Proposer Response:** [redacted]		

Req ID	Performance Requirements (Section PR)	Required	Value Add
	[redacted]		
PR-006	For each vehicle passing through a Tool Zone with properly mounted Transponders in or on the Vehicle, the TCS shall accurately detect, report, and correlate with the correct vehicle all required Transponder information (i.e., date, time, Transponder numerical id) at an overall accuracy rate of 99.95%; if more than one Transponder is properly mounted in or on the Vehicle, the TCS shall report all such Transponders identified, but the requirements specified in this Section shall only apply to one Transponder's reads.	X	
	Note: This requirement will be evaluated by the Joint Board for compliance on a monthly basis. **Proposer Response:** [redacted]		
PR-007	Each vehicle passing through a Tool Zone shall be detected and reported once and only once (no exception for lane equipment or network degradation).	X	
	Note: This requirement will be evaluated by the Joint Board for compliance on a monthly basis. **Proposer Response:** [redacted]		
PR-008	Each vehicle passing through a Tool Zone shall have at least one image that includes the vehicle make, model and license plate number captured and correlated with the correct vehicle at an accuracy rate of 99.9%. All Images of a vehicle passing through a Tool Zone shall be human readable at an accuracy rate of 99%.	X	
	Note: The Proposer shall identify in this Technical Response Form the size (in feet for the length and height), and the number of images captured and made available to the BOS. This requirement will be evaluated by the Joint Board for compliance on a monthly basis. **Proposer Response:** [redacted]		
PR-009	The Tool System Provider shall comply with the following times to respond to issues, deficiencies and problems and to repair equipment. These times are based on priority classification by event location and exclude provision of maintenance of traffic responsibilities (so long as such maintenance of traffic times are strictly within the time periods of this PR-009 section); These times apply 24 hours per day, 7 days per week: • Priority 1 –Four hours to respond • Priority 2 –72 hours to respond • Priority 3 –10 days to respond	X	

Req ID	Performance Requirements (Section PR)	Required	Value Add
	In all cases, setup of maintenance of traffic shall be no more than 1 hour upon approval, and demobilization of maintenance of traffic once repair is complete shall be no more than 1 hour.		
	The Priority Levels are defined as follows: Priority 1 is defined as – any failure that will result in loss of ability to collect or accurately collect revenue, including lane closures, safety hazard, or loss of traceability and loss of auditability in the TCS. Priority 2 is defined as – any failure of a System component that will result in a degradation of System performance or results in the loss of redundancy in a key System component, but does not qualify as a Priority 1 event. Priority 3 is defined as – minor failure of the equipment, network or Software or an indication that an event may occur that would result in a malfunction or degradation of the System. In order to ensure maintenance of traffic notification is measured in a timely manner, the Joint Board shall be copied on the notification to the maintenance of traffic provider. The Joint Board, in its sole discretion, shall determine the priority of an event (and any delay or failure by the Joint Board to identify the priority shall indicate that the event has a priority level of Priority 1). Note: This requirement will be evaluated by the Joint Board for compliance on a monthly basis. **Proposer Response:** [redacted]		
	Back office System		
PR-010	The BOS, including the IVR and Customer Website shall be available 99.9% of the time (See Exhibit N to the Agreement for details regarding calculation of BOS availability.) The BOS shall provide all functional service at a 99.9% availability excluding approved routine or approved scheduled maintenance periods of up to 80 hours per year.	X	
	Note: This requirement will be evaluated by the Joint Board for compliance on a monthly basis. **Proposer Response:** [redacted]		
PR-011	[Intentionally not used.]		

Req ID	Performance Requirements (Section PR)	Required	Value Add
PR-012	Home and away agency Transponder status files shall be loaded and distributed to the TCS within 2 hours of receipt at least 99% of the time. If the Tool System Provider has written proof that the away Transponder status file was not sent by the away agency, failure to load and distribute a Transponder file for such away agency shall not be counted as a failure in the calculation.	X	
	Note: This requirement will be evaluated by the Joint Board for compliance on a monthly basis. **Proposer Response:** [redacted]		
PR-013	The BOS shall post 99.8% of Traffic Transactions, Financial Transactions, and Event Transactions completely and accurately to the TCS. Any exceptions shall be recorded with an "exception" transaction in the system with an appropriate exception code.	X	
	Note: This requirement will be evaluated for by the Joint Board for compliance on a monthly basis. **Proposer Response:** [redacted]		
PR-014	The Tool System Provider shall review and accurately post to the appropriate account all Traffic Transactions in accordance with the approved Business Rules no later than 2 days after the vehicle passed through the Tool Zone, at an accuracy level of 99.5% or higher. Images embedded in any Correspondence shall include a color picture that clearly identifies the make, model, color and license plate of the vehicle.	X	
	Note: This requirement will be evaluated by the Joint Board for compliance on a monthly basis. **Proposer Response:** [redacted]		
PR-015	All required Financial Transactions shall be processed within one (1) business day of business day closure on the day they occurred. Financial Transactions shall include all payments (regardless of payment method). Weekend or holiday Transactions shall be processed no later than the following business day.	X	
	Note: This requirement will be evaluated by the Joint Board for compliance on a monthly basis. **Proposer Response:** [redacted]		

Req ID	Performance Requirements (Section PR)	Required	Value Add
	[redacted]		
PR-016	All required financial exceptions shall be processed within one (1) business day of business day closure on the day they occurred. Financial exceptions are adjustments, reversals or refunds.	X	
	Note: This requirement will be evaluated for compliance by the Joint Board on a monthly basis. The timeframe for a disputed transaction for E-ZPass transactions outside of Tool System Provider's control will be determined during development of the approved Business Rules. **Proposer Response:** [redacted]		
PR-017	The Tool System Provider shall enter into the System all license plate and demographic information received from a DMV within one (1) day of data receipt.	X	
	Note: This requirement will be evaluated for compliance by the Joint Board on a monthly basis. **Proposer Response:** [redacted]		
	Customer Center		
PR-018	The average call wait time shall not exceed a monthly average of 2 minutes during Startup Operations and shall not exceed a monthly average of 60 seconds during Steady State Operations as reported on the phone system reports. The average call wait time is measured based on all calls received during a monthly period.	X	
	Note: This requirement will be evaluated by the Joint Board for compliance on a monthly basis. **Proposer Response:** [redacted]		
PR-019	All calls shall be handled in a professional and courteous manner all of the time. The Tool System Provider shall monitor at least 2% of all calls, measured monthly commencing with Pre-Tool Operations. For calls monitored the TSP shall have a regular quality control process and results shall be reported in the Monthly Operations and Maintenance Report.	X	
	Note: This requirement will be evaluated for compliance by the Joint Board on a monthly basis. **Proposer Response:** [redacted]		

Req ID	Performance Requirements (Section PR)	Required	Value Add
	[redacted]		
PR-020	Best efforts shall be made to resolve escalated calls related to TCS services and policies while the customer is on the telephone without need for a call-back. Escalations that require involvement of an external agency are not included for purposes of calculating compliance with this requirement. TSP shall open a service request for all escalations that cannot be addressed while the customer is on the phone, and shall track the service request through the reporting system.	X	
	Note: This requirement will be evaluated by the Joint Board for compliance on a monthly basis. **Proposer Response:** [redacted]		
PR-021	The TSP shall not escalate more than 5% of the total calls received by the CSC outside of the CSC.	X	
	Note: This requirement will be evaluated by the Joint Board for compliance on a monthly basis. **Proposer Response:** [redacted]		
PR-022	The CSC shall resolve a minimum of 65% of calls during Startup Operations and 80% of the calls during Steady State Operations regarding ETC transactions, video transactions, Violations, products, services and policies accurately on the first contact made by the customer.	X	

Req ID	Performance Requirements (Section PR)	Required	Value Add
	Note: This requirement will be evaluated by the Joint Board for compliance on a monthly basis. The resolution of the call shall mean that the customer's questions were answered in way such that the customer does not have to call back for the same issue or information was provided in response to the customer inquiry in way such that the customer does not have to call back for the same issue. **Proposer Response:** [redacted]		
PR-023	All call monitoring shall be part of the regular QC process and reported in the Monthly Operations and Maintenance Report. The TSP shall cooperate with and assist the Joint Board in conducting random monitoring and recording the results.	X	
	Note: This requirement will be evaluated by the Joint Board for compliance with this requirement on a monthly basis. **Proposer Response:** [redacted]		
PR-024	Customer Correspondence shall be stamped as received the business day it is received. Correspondence received on non-business days shall be stamped as received on the first business day after the non-business day.	X	
	Note: This requirement will be evaluated by the Joint Board for compliance on a monthly basis. **Proposer Response:** [redacted]		
PR-025	All new customer account applications shall be processed and recorded within the System within two (2) business days of receipt of the completed application.	X	
	Note: This requirement will be evaluated by the Joint Board for compliance on a monthly basis. **Proposer Response:** [redacted]		

Req ID	Performance Requirements (Section PR)	Required	Value Add
	[redacted]		
PR-026	All payment types (check cash or credit card) shall be processed for payment by the System within one business day.	X	
	Note: This requirement will be evaluated by the Joint Board for compliance on a monthly basis. **Proposer Response:** [redacted]		
PR-027	100% of all correspondence types other than payments shall be processed and recorded in the System within three (3) business days.	X	
	Note: This requirement will be evaluated by the Joint Board for compliance on a monthly basis. **Proposer Response:** [redacted]		
PR-028	All money paid to the CSC shall be credited into the designated bank accounts provided by the Joint Board. All customer payments shall be deposited within 24 hours of when they are received; if such day is a weekend or holiday day on which the relevant bank is closed, the deposit shall be made by the next Day on which the relevant bank is open for business.	X	
	Note: This requirement will be evaluated by the Joint Board for compliance on a monthly basis. **Proposer Response:** [redacted]		
PR-029	The CSC availability shall meet the following minimum requirements. Self Service – 24 hours x 7 days per week For Startup Operations: Customer Service Representative and Walk Up Center - Monday-Friday 7 am-7pm Saturday 8am-2pm, Eastern Standard Time, excluding approved holidays. For Steady State Operations: Customer Service Representative and Walk Up Center - Monday-Friday 8 am-6pm, Eastern Standard Time, excluding approved holidays. Holidays on which the CSC may be closed include New Year's Day, Memorial Day, the 4th of July, Labor Day, Thanksgiving Day, Christmas Day and other holidays mutually agreed to by the Tool System Provider and the Joint Board. The Tool System Provider shall work with the Joint Board to jointly develop the Holiday schedule for each Contract year.	X	

Req ID	Performance Requirements (Section PR)	Required	Value Add
	Note: This requirement will be evaluated by the Joint Board for compliance on a monthly basis. **Proposer Response:** [redacted]		
PR-030	The Tool System Provider shall notify the Joint Board of all planned outages at least one week in advance. The Tool System Provider shall notify the Joint Board within 2 hours of a known unplanned outage with notice of the planned up time.	X	
	Note: This requirement will be evaluated by the Joint Board for compliance on a monthly basis. **Proposer Response:** [redacted]		
PR-031	99.99% of Transponder orders placed in person shall be filled within the same business day. All Transponder orders placed in person not filled in the same business day in which the order was placed shall be filled before the end of the next business day. 90% of Transponder orders not placed in person shall be filled before the end of the day after the day in which the order was placed. All Transponder orders not filled before the end of the day after the day in which the order was placed shall be filled before the end of the second business day after the day in which the order was placed. In person orders are those placed at a WUC or at a retail provider. An order is filled when it is either handed to the customer or mailed to the customer at the best address available to the TSP as indicated in the Business Rules.	X	
	Note: This requirement will be evaluated by the Joint Board for compliance on a monthly basis. **Proposer Response:** [redacted]		

Req ID	Performance Requirements (Section PR)	Required	Value Add
	[redacted]		
PR-032	The Tool System Provider staff shall be scheduled according to expected call arrivals in order to comply with the requirement that a minimum of 80% of calls be answered by a live representative within 30 seconds, calculated by dividing the number of calls answered by a live representative within 30 seconds by total number of calls received by the IVR.	X	
	Note: This requirement will be evaluated by the Joint Board for compliance on a monthly basis. **Proposer Response:** [redacted]		
PR-033	It is desired that the IVR answer in one ring cycle for inbound calls and customers enter the IVR tree to be presented self-service options or allowed to speak with a customer service representative during business hours.		X
	Note: If Proposer indicates it will provide this functionality, this requirement will be evaluated by the Joint Board for compliance on a monthly basis. **Proposer Response:** [redacted]		
PR-034	[Intentionally not used.]	X	
	Proposer Response:		
PR-035	[Intentionally not used.]		
PR-036	The CCTV system shall be available no less than 99% of the time.		
	Note: Availability is defined as access to the CCTV system by remote users and the ability to use and view video in near- real-time for TCS operations. Near-real-time is defined for this requirement as the video being displayed within 2 seconds of the user requesting a camera view. This requirement will be evaluated by the Joint Board for compliance on a monthly basis. **Proposer Response:** [redacted]	X	

Financial Requirements

Req ID	Financial Requirements (Section FR)	Required	Value Add
FR-01	All elements of the TCS shall be subject to audit of Financial Transactions, Traffic Transactions and Event Transactions.	X	
	Note: The Revenue Control Manager, external auditors or other entities will audit and require Transaction reconciliation of the TCS from the Roadside System through the BOS. **Proposer Response:** [redacted]		

Req ID	Financial Requirements (Section FR)	Required	Value Add
	[redacted]		
FR-02	The Toll System Provider shall provide a TCS that meets US GAAP policy and procedures and is subject to US GAAP audits and compliance on a regular basis. All elements of the TCS shall be subject to audit of Financial Transactions, Traffic Transactions, and Event Transactions.	X	
	Proposer Response: The TCS complies with requirement FR-02. As referenced in FR-01 above, the TCS meets or exceeds the US GAAP Policy and procedures. An Auditor who applies US GAAP Audits and compliance on a regular basis will have no problem auditing the TCS for financial, traffic, and event transactions. The TCS Financial module helps efficient handling of financial transactions by providing multiple ways of payments through various payment means, and at the same time provides tools to reconcile and audit transactions for a complete audit trail of each financial transaction that occurs in the system. This system uses the Financial Interface to handle all of the financial-related transactions of the entire Back Office system. The Interface functions handle the validation of the underlying Transaction Code definitions, Module Control Configuration, and Maintaining the data integrity and relationship of the Financial Definition Scheme, all of which comply with GAAP. The three following systems are used as part of Financial Processing: 1. Charge Finance System (CFS): To manage all financial related activities for the Scheme User accounts. 2. Payment Reconciliation: To handles reconciliation of payments and settlements between Back Office system and the Customer Bank accounts. Automated reconciliation processes will be handled by COTS reconciliation product (IDEA). 3. Financial Reporting System (FRS): To generate financial reports The following diagram shows the Financial Processing subsystems within the Back-Office architecture:		

Req ID	Financial Requirements (Section FR)	Required	Value Add
	[redacted] from a financial point of view are traceability, authorization levels, and security. As shown above, TCS fully meets US GAAP policy and procedures and is open to US GAAP audits and compliance on a regular and routine basis. It supplies accounting data in sufficient detail to allow full US GAAP analysis, disclosure and audit. Furthermore, the TCS maintains all accounting data in full detail and produces a daily Trial Balance and a suite of daily analysis reports. These reports can be configured to match any accounting standard as demonstrated by the proposed system as well as Government Internal Audit Standards (GIAS) as recommended by HR Treasury for Executive Non-Departmental Public Bodies (NDPBs). These standards exceed or meet GAAP reporting and audit standards required because they were standards designed for internal audit. The GIAS further provides guidelines for best		

Req ID	Financial Requirements (Section FR)	Required	Value Add
	practice in terms of ethics, code of conduct integrity of work and professional due care, that are the basis for the finance function of the Service Provider in its duties on behalf of the Customer.		
FR-03	The Toll System Provider shall coordinate with the Revenue Control Manager and Custodian. The Toll System Provider shall be a party to the Custody and Revenue Control Agreement, substantially in the Form of Exhibit O to the Agreement, once finalized prior to Revenue Service.	X	
	Note: The Joint Board anticipates that Transaction reconciliation will be performed, and top level secure financial accounts will be established and managed, substantially as outlined in Attachment C-3. The Joint Board has contracted with a Revenue Control Manager that will be responsible for the confirmation and certification of reconciled funds received from the Toll System Provider. A Custodian established pursuant to the Custody and Revenue Control Agreement will serve as the trustee's representative to distribute revenues into the States' Parties' accounts. **Proposer Response:** The TCS complies with requirement FR-03. We will coordinate with the Revenue Control Manager and Custodian, and will be a party to the Custody and Revenue Control Agreement, as indicated in the Form of Exhibit O. Sanef has no issue with Attachment C-3's outline of how the transaction reconciliation will be performed, and top level secure financial accounts established and managed. Sanef's TCS ensures that no payment is accepted by the system unless it has been assigned a unique identifier by the system. This unique identifier is used to ensure that all funds received are fully reconciled. Furthermore, the TCS is configured to interact with a dedicated reconciliation tool (Auditware IDEA).		
FR-04	The Toll System Provider shall adhere to the Flow of Funds diagram in Attachment C-3 in handling all Funds.	X	
	Proposer Response: The TCS complies with requirement FR-04. Sanef will adhere to the Flow of Funds diagram in Attachment C-3 in handling all Funds. Sanef's TCS is configurable to allow multiple bank accounts to be used, controlled and recorded. As such, the flow of funds identified in C-3 presents no technical or financial issue for Sanef.		
FR-05	The Toll System Provider shall reconcile Financial Transactions transmitted to Custodian Accounts on a daily basis. All revenues and funds shall be swept on a daily basis to the Custodian to ensure that all revenues are deposited in a secure account and reconciled prior to the distribution to the States' Parties' accounts.	X	
	Note: The Proposer shall describe in this Technical Response Form how the TCS handles movement of funds and reconciliation of Transactions in the System. **Proposer Response:** The TCS complies with requirement FR-05. The TCS assigns a unique identifier to all payments received. The TCS uses this unique identifier to track all funds through the system. All funds received are internally reconciled with deposits into accounts using the Auditware IDEA reconciliation software package each day. Output of IDEA is entered into our financial reporting and accounting system with the unique identifier when they are received. Each day, we sweep all revenues and funds received on that day to the Custodian account. We also reconcile the daily statements from the bank with our records of funds transferred to the bank. The following figure displays these activities as a left-to-right process. The inputs/outputs, movement of funds, and reconciliation of the Financial Processing in the system. All revenues and funds that come through the system – Penalty Charge Notices (PCNs), roadside toll transactions (RUC), and any payments received from accounts and financial transactions—will be swept on a daily basis to the IDEA Payment Reconciliation System to ensure that all revenues are deposited in a secure account and reconciled. The outputs of the Reconciliation process are input into the Charging Finance System, which creates the Trial Account Balance and reported in the daily financial reports distributes them internally and to the Joint Board and authorized representatives. In parallel to these processes, all funds received are swept to the Custodian account each day.		

Req ID	Financial Requirements (Section FR)	Required	Value Add
	[redacted] **Detailed Data Flow** This section presents the same information as above, but in greater detail: A more detail explanation is that Payment Reconciliations are also handled by COTS reconciliation product (IDEA) in the TCS. The details are then sent to an external accounting system on daily basis. The Financial process in the Back Office system goes through the following steps: • The Back Office processes payments and reconciles passages to RUC payments and marks them as paid. • The process enables the CSR Supervisor to manage Scheme User Account and adjust their balance where it is required. For example, they can perform payments reversals, adjustments or refunds. • The financial transactions are posted against a financial transaction code and mapped directly to the General Ledger Accounts governed by the Back Office		

Req ID	Financial Requirements (Section FR)	Required	Value Add
	Accounting system. • The Back Office system reconciles payments on a daily basis. The payment reconciliation process matches the quantity and amounts of the payments processed during the previous day with the daily reports sent by the Bank: Cash (via Retail) / Check/ Direct Debit/ etc. • The Back Office system logs any discrepancies recorded during the reconciliation • The Back Office system runs a daily summarization to generate a Trial Balance as an input to the external accounting The financial accounting and reporting system used in the production of Financial Statements of the road charging operation. Features of the system include provision of an audit trail and the production of reports common in any financial accounting system. An interface between the Charge Finance System (CFS) and the Financial Reporting System (FRS) is used for internal business accounting. The CFS data are sent to the CFS on a daily basis in a batch mode. The Back office system ensures that batch totals are applied to ensure the completeness and accuracy of the interface.		
FR-06	The Toll System Provider shall interface the TCS with a commercial accounting system provided by the Revenue Control Manager.	X	
	Note: The accounting system will be determined at a later date, currently anticipated to be available by June 1st, 2015. **Proposer Response:** [redacted]		

Req ID	Financial Requirements (Section FR)	Required	Value Add
	[redacted]		
FR-07	The Toll System Provider shall update the accounting system with current financial elements of the System (debits/credits) no less frequent than every 24 hours.	X	

Req ID	Financial Requirements (Section FR)	Required	Value Add
	Proposer Response: The TCS complies with requirement FR-07. Sanef's TCS shall update the accounting system with current financial elements of the System (debits/credits) every 24 hours as required. To aid the direct transfer of financial transactions (i.e. the Financial Journals (FJ's)) from TCS to the Authority's financial system, we will introduce a General Ledger (GL) account code mapping interface with the agreement of the Joint Board. This mapping of GL Account codes will enable the reposting of FJ's from TCS to the Authority's financial system effortlessly on a daily basis depending on the Authority's requirements on frequency of a FJ upload.		
FR-08	The TCS shall track interoperable Financial Transactions by interoperable agency.	X	
	Proposer Response: The TCS complies with requirement FR-08. The Sanef TCS is currently operating in several fully interoperable environments—the Port Mann bridge is fully interoperable with the Golden Ears Bridge (a separate tag-issuing agency), and the Dublin M50 supports payments from the five tolling service providers in Ireland. The TCS will track interoperable financial transaction by interoperable agency by reading the transponder. In E-ZPass, each transponder has a unique code that identifies the interoperable agency that issued the transponder, and these codes allow the Sanef TCS to map each transaction to the interoperable agency that issued the tag that initiated the transaction. The TCS will generate a report that will track the financial transactions and split out by interoperable agency. This report will illustrate both what is owed by each interoperable agency and what is owed to each interoperability agency.		
FR-09	The Toll System Provider shall map financial (cash management and custodial) accounts established by the Joint Board to multiple Financial Transaction codes (e.g. tolls, fees, credit payments, adjustments and reversals) and such accounts and codes shall be traceable in the TCS to demonstrate that the financial accounting system (provided by others) reconciles with the TCS.	X	
	Proposer Response: [redacted]		

Req ID	Financial Requirements (Section FR)	Required	Value Add
	[redacted]		
FR-010	The Toll System Provider shall make customer refunds within 24 hours of confirmation that a refund is owed, and shall make payments to interoperable agencies and transfer funds received for deposit into Joint Board accounts, in accordance with the approved Business Rules.	X	
	Proposer Response: [redacted]		

Req ID	Financial Requirements (Section FR)	Required	Value Add
	[redacted]		
FR-011	The Toll System Provider shall track receipt and disbursal of payments in the TCS by payment type and source, including but not limited to: by interoperable agency, by payment type (credit card, cash, check), by refunds or adjustments, and by tolls or fees such as invoice fees, administrative fees or penalties.	X	
	Proposer Response: [redacted]		

Req ID	Financial Requirements (Section FR)	Required	Value Add
	[redacted]		
FR-012	Overpayments or underpayments shall be applied to an account, and records of the overpayments and underpayments to an account shall be readily available for review in reports generated by the TCS. Unapplied balances shall be transferrable to the customer account Customer Statements where applicable. An unapplied balance report shall be available on a daily, weekly and monthly basis.	X	
	Proposer Response: The TCS complies with requirement FR-012. The Sanef TCS automatically credits Overpayments and underpayments to customers' accounts. Overpayments will be readily available, for example, with post-paid registered accounts and overpayment will be seen as a negative balance on the account. Un-applied balances will automatically be applied to customer statements. For example, on a post-paid registered account, if a balance is not collected in a certain month, this balance will roll over to the next month. In this manner a two (2) month balance may be collected the following month. This means that all unapplied balances are transferred to customer statements. This is the same process for underpayments. Reports of overpayments or underpayments can be made available from TCS for any time parameter (daily/weekly/monthly). We will discuss the frequency of reporting with the Joint Board during business rules discussions.		
FR-013	The Toll System Provider shall provide exceptions management system functionality and an exceptions operation process for payment. For example, the TCS shall have an operational procedure so that if payments without an account remittance slip are received by the lockbox, the operator is able to research and locate the account holder in the system, and apply the unallocated funds to a credit on a customer account. The TCS shall include a coding mechanism in the ERS that provides sufficient reporting to track any exceptions.	X	
	Proposer Response: [redacted]		

Req ID	Financial Requirements (Section FR)	Required	Value Add
[redacted]			
FR-014	Updates to Financial Transactions shall never modify existing Transactions. All Financial Transactions shall be appended to the original record when fees, fines, or tolls are partially or wholly discounted or escalated manually by an operator of the System. A list of all Financial Transactions (including codes) shall be provided in the System Documentation and logged with the associated Traffic Transactions in the TCS.	X	

Req ID	Financial Requirements (Section FR)	Required	Value Add
	Proposer Response: The TCS complies with requirement FR-014. From a Sanef TCS financial accounting point of view, the TCS is fully secure or "locked down." It is not possible to manipulate financial data or post journals on the system. This ensures that all reports from TCS reflect the financial aspect of the primary transactions that actually took place. When financial transactions take place, they are appended to the original record, for example when fees, fines, or tolls are partially or wholly discounted or escalated manually by an operator of the System. We will provide a list of all types of Financial Transactions (including codes) in the System Documentation and log transaction type with the associated Traffic Transactions in the TCS. The Sanef TCS is subject to a number of quality controls to ensure its security (International Standards Organization (ISO) 9001, 27101 and Payment Cards Industry (PCI) compliance, Claim Handlings Rate Financial Reconciliations which is audited. The CFS provides an automated audit trail allowing any action to be tracked and interrogated. All Account Holders' accounts will include a financial screen on which any action with a financial impact will be displayed. The identity of the person who performed the action will be recorded and displayed. All transactions processed in the CFS shall have a unique identifier associated against them for financial processing, interrogation, and reconciliation. The unique identifier will be an internally generated unique sequential number. The CFS will include a suite of financial reports that can be viewed in summary or detail. The detailed versions of the reports shall include transaction information specified by the Customer and will enable the user to drilldown to individual transactions by individual operators.		
FR-015	It is desired that the Toll System Provider provide manual processes to associate unspecified funds (i.e. a check without payment coupon or correct account information) to the proper customer account and apply these funds to the proper account.		X
	Note: The Proposer shall describe in this Technical Response Form the complete process including manual efforts required to locate the proper account and apply the funds to that account. **Proposer Response:** [redacted]		

Req ID	Financial Requirements (Section FR)	Required	Value Add
	[redacted]		

Req ID	Financial Requirements (Section FR)	Required	Value Add
	[redacted]		
FR-016	The Toll System Provider shall safeguard cash deposits and shall provide any necessary or advisable armored car services and other means to secure all cash that is in Toll System Provider's custody or control.	X	
	Proposer Response: [redacted]		
FR-017	All money paid to the CSC shall be credited into the Custodian Accounts. All customer payments shall be recorded in the TCS within 24 hours of when they are received by the Toll System Provider.	X	
	Proposer Response: [redacted]		

Req ID	Financial Requirements (Section FR)	Required	Value Add
	[redacted]		
FR-018	The Toll System Provider shall process refund requests from customers. Credit card or debit card-based toll accounts shall be refunded to the same card. Cash toll accounts shall be refunded with a check mailed to the address of record on the account.	X	
	Note: The Proposer shall outline in this Technical Response Form its existing refund process including escalation processes for unresolved refund requests and authorization levels. **Proposer Response:** [redacted]		

Req ID	Financial Requirements (Section FR)	Required	Value Add
FR-019	The Toll System Provider shall provide reports used for accounting and reconciliation of financial data. The reports must address the following functions at a minimum: 1. Cash and all other payments collected at the CSC storefronts and other retail outlets under contract, 2. Account deposits, shortages and overages, 3. Adjustments, 4. Daily reconciliations, customer accounts balances, CSC and VPS activities, tolls collected and tolls posted, images received versus video images processed, 5. Recommended fund transfers, deposits and withdrawals, 6. By CSC for each shift, number of Transaction types, deposits by payment type, cash deposits, low, high and average value, 7. Aggregate account balance activity including beginning-of-day and end-of-day balances, all tolls and fees, and replenishments, and 8. Interoperable account activities for home and away Transactions for Traffic Transactions reconciliation and settlement. Additional financial related reports may be submitted for evaluation.	X	
	Proposer Response: [redacted]		

Req ID	Financial Requirements (Section FR)	Required	Value Add
	[redacted]		
FR-020	The Toll System Provider shall interface to an accounting system (provided by the Revenue Control Manager) to support reporting of the cash flow and all resources.	X	
	Note: The Toll System Provider shall submit in this Technical Response Form a summary of data that can be provided by the TCS in a system to system interface (e.g. FTP site) daily to support a financial management system. While the TCS and Accounting System will transmit data, there will be no system to system integration between the accounting system (provided by others) and the TCS, except the file transfer of reconciled data shall be automated in the System. **Proposer Response:** The TCS complies with requirement FR-020. The TCS currently interfaces with an external accounting system in several of our projects. Transfer of data is typically done in forms such as excel and csv files. These files will include data that summarizes cash flow and all resources. We will finalize the		

Req ID	Financial Requirements (Section FR)	Required	Value Add
	contents of these files in discussions with the Revenue Control Manager. A summary of the Financial interface appears above in FR-013.The following list summarizes the data that can be provided on a system-to-system interface. Many further sub-categorizations are possible that are listed in this summary. **Revenue:** Toll Revenue (by toll zone; by account type; by payment method; by payment channel; etc.), Penalty Revenue (by PCN; by payment method; by payment channel; etc.), Penalty Recovery Revenue, Other Revenue, Revenue Adjustments **Expenses**: Operating Expenses (labor by category; real estate leases; all fees by type; bank charges; utility charges; etc.), Depreciation/Amortization, Other Operating Expenses, Administration, Fixed asset expenses, Debtors (unregistered customers, unallocated cash), Debtors in Enforcement/Collections/Adjudications (unregistered customers, unallocated cash), Cash, Creditors, Accumulated funds.		
FR-021	The TCS shall provide for a methodology to batch process refund checks to the third party accounting system or Custodian who disburses revenue.	X	
	Proposer Response: The TCS complies with requirement FR-021. The Sanef TCS maintains sufficient detail to allow batching of refund checks. In fact, the system is sufficiently flexible to run one-off checks on demand or process refund checks to third parties so that the Accounting staff can batch process a number of checks in one check-run from the system.		
FR-022	The Toll System Provider shall provide an interface to the accounting system.	X	
	Note: The Proposer shall provide in this Technical Response Form a list of configurable financial accounting codes that track debits, credits and adjustments and reve to all payments received in the System, including but not limited to credit cards by type, lockbox, check, and any other payments received in the System. **Proposer Response:** [redacted]		

Req ID	Financial Requirements (Section FR)	Required	Value Add
	[redacted]		
FR-023	The Toll System Provider shall have financial codes for Traffic Transactions and Financial Transactions that will be transmitted to an external accounting system that separates administrative fees, fines and discounts from the tolls so they can be accounted for separately during reconciliation. All financial codes and associated Transactions shall meet all system availability and data retention requirements.	X	
	Proposer Response: [redacted]		
FR-024	The Toll System Provider shall provide double entry recording for all Financial Transactions in the System.	X	
	Proposer Response: [redacted]		

Req ID	Financial Requirements (Section FR)	Required	Value Add
	[redacted]		
FR-025	The Toll System Provider shall provide reports that provide the existing debits and credits no less than every 24 hours. All reports shall be automated for delivery and shall be reconciled against the data transmitted to the commercial accounting system (e.g. general ledger) provided by others.	X	
	Proposer Response: The TCS complies with requirement FR-025. The TCS Financial Module will be updated in a real time basis. It will automatically generate a suite of reports each day. It will automatically reconcile these reports against the data provided to the commercial accounting system. These reports can be downloaded from a location on the network for authorized users. They can also be sent to a list of authorized recipients automatically.		
FR-026	The TCS shall provide an audit trail for all Traffic Transactions and Financial Transactions that shows all changes made in the system with respect to the relevant Traffic Transaction and Financial Transactions, including what was changed and by whom (system or non-system user) including a reason for the change if applicable.	X	
	Proposer Response: [redacted]		
FR-027	Every payment (receivable) in the TCS shall be traceable to payment method, payment type and source of payment.	X	
	Proposer Response: The TCS complies with requirement FR-027. The TCS logs all payment activity with payment method, payment type and source of the payment. It displays the payment [redacted]		

Req ID	Financial Requirements (Section FR)	Required	Value Add
	[redacted]		

Req ID	Financial Requirements (Section FR)	Required	Value Add
	[redacted]		
FR-028	The TCS shall provide self-balancing, double entry accounting consistent with GAAP.	X	

Req ID	Financial Requirements (Section FR)	Required	Value Add
	Proposer Response: [redacted]		
FR-029	The Toll System Provider shall provide functionality to support home or away interoperable Traffic Transactions processed by the Roadside System. The TCS shall process all types of Traffic Transactions including but not limited to ETC, Unregistered Video, and registered video Traffic Transactions.	X	
	Proposer Response: [redacted]		
FR-030	The TCS shall provide adjustments and reversals to support refund processing to accounts for the disbursement of money to customers, States' Parties, interoperable agencies, and external service providers, including but not limited to the lockbox provider, collection agency and credit card payment processers.	X	
	Proposer Response: [redacted]		

Req ID	Financial Requirements (Section FR)	Required	Value Add
	[redacted]		
FR-031	The Toll System Provider shall issue refund checks for overpayments of prepaid ETC Accounts or Registered Video Accounts that are closed or inactive (after a configurable time period) to customers. The TCS shall automatically change an account status to closed or inactive when there has been no activity for a configurable (from 0 to 999 days) number of days.	X	
	Proposer Response: The TCS complies with requirement FR-031. When a customer requests that their account be closed, we will place the account into a pending close position. The pending closed account flag will remain in this state for a configurable time period (typically 30 days) to ensure all funds in the account have cleared and to ensure no other activity is on the account during the pending closed status position. After this configurable time period, if the customer has a credit balance, the TCS refunds it to them via their credit card, check, or electronic funds transfer (depending on their method of payment). At the time of refund, the account will be brought to zero balance by this refund and the account will be closed automatically by the TCS. The TCS can be set to automatically change an account status to inactive or closed when there has been a period of inactivity (configurable from 0 to 999 days). The		

Req ID	Financial Requirements (Section FR)	Required	Value Add
	TCS can also provide automatic notification to customers that their accounts will be set to inactive or closed a configurable number of days before the threshold for inactivity is reached. The TCS can report on accounts that are inactive for definable periods of time to provide management an indication of inactive accounts and accounts marching towards inactive status. This provides managerial visibility to the status of inactivity and the resulting balance of accounts remaining active. It also provides management with a clear picture of what accounts will be placed in a pending closed account status over the next weeks and months of operation. A diagram of the refund process is shown in a flow chart diagram in the response to FR-030.		
FR-032	The Toll System Provider shall describe how unclaimed property is handled within the System for in-active accounts with one (1) year or more of no activity. The inactivity period shall be configurable.	X	
	Proposer Response: The TCS complies with requirement FR-032. In general, if an account is inactive for a configurable period of time, such as 1 year, the TCS sends an automatic notification to the customer that their account is subject to becoming closed or inactive. After that, the system waits a further configurable time period, typically 30 days, before closing an account and sending out a refund. In cases where the refund is not claimed by the owner (e.g., credit cards for refund are rejected, checks are not cashed, bank transfers are refused), the accounting system holds the funds as unclaimed for a further configurable period of time. After that further configurable period of time, the system will transfer those funds to Joint Board as unclaimed property. This further configurable period of time must be less than the archival period of data. The refund process is shown in the flow chart diagram in the response to FR-030.		
FR-033	All funds received from all payment sources external to the TCS shall be provided to the Joint Board on a gross basis unless an approved external vendor does not support gross payment remittance. If an external vendor(s) does not support gross payment remittance, the Toll System Provider shall provide a separate transaction record that clearly itemizes gross revenue and all deductions therefrom made by the external vendor(s).	X	
	Note: The Proposer shall describe all such instances and the associated fees, which shall be on an actual cost basis only. **Proposer Response:** [redacted]		

Access Control and CCTV Requirements

Req ID	Access Control and CCTV Requirements (Section AC)	Required	Value Add
	Access Control Requirements		
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.	X	
	Proposer Response: The TCS complies with requirement AC-001 by including a card access system to all secured doors including all roadside cabinets for the provider equipment. The cards will be part of an integrated systems software application that will record all entry and exits to the particular door. Card access controls will be integrated to a single software program accessible through the BOS for those users with the appropriate permissions. We intend to utilize a Paxton Card access system (the Net 2 system), a system that Arrow Electric has used on other secure installations with excellent results, that will custom generate the cards to include photo ID in the card if deemed necessary. We will issue ten Cards (10) to the Joint Board for their use. [redacted]		
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.	X	
	Proposer Response: The TCS complies with requirement AC-002. We will provide, install, and configure an Avigilon pan-tilt-zoom CCTV camera that will overlook all equipment cabinets, and integrate it into our system so the output of the cameras can be viewed from the CSC by those with the appropriate authorizations. We will integrate the cameras through proprietary software Standard feature of Avigilon Control Center (ACC) (Enterprise Edition) - Utilizing the Rules Engine and interconnectivity between the ACC and ACM systems.		
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.	X	
	Proposer Response: The TCS complies with requirement AC-003. We will furnish and install a proprietary card access software and hardware system (the Paxton Card access system) that will record all entry and exits to secured doors. The system has the capacity to badge and record up to 10,000 access cards and maintain constant logs and recordings of activity. The proposed system can be calibrated to activate an alarm to the system if the door does not secure to settings from 1 second to 999,999 seconds. The proposed software is capable of being programed to provide various levels of security access to specific areas, so users only have access to the specific secure areas required for their roles.		
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.	X	
	Proposer Response: The TCS complies with requirement AC-004. Our card access system defines and manages user roles, including permanent and temporary assignments, changes in access control for entire roles or for specific users, and de-activation of cards. We intend to provide a Net 2 software and hardware system as produced and supported by Paxton Industries. All security rights within the system are “roles-based” and can be delegated by the System Administrator.		
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.	X	
	Proposer Response: The TCS complies with requirement AC-005. We will use an Access Control Manager (ACM) with cards from the Paxton Net 2 system, which we have successfully employed in other secure facilities. Key access will be supported for emergency/power outage situations, but only a very limited number of keys will be available. Key access is by door hardware supplier. All door & access activity is logged and available for on-demand reporting, including by activity type, by user accounts, and by user. We will work with the joint board during business rules talks to design a basic access control report format as required.		
	CCTV		
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	X	

Req ID	Access Control and CCTV Requirements (Section AC)	Required	Value Add
	security purposes.		
	Proposer Response: The TCS complies with requirement AC-006. We will install CCTV roadway cameras on the gantries and employ Avigilon Control Center (ACC) (Enterprise Edition) software, which will allow us to monitor the traffic, toll zones, and equipment sites for security purposes. The Proposer has significant experience having installed and operated similar CCTV roadway camera systems on other projects.		
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; and 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.	X	
	Proposer Response: The TCS complies with requirement AC-007. We will install roadway overview cameras on all toll gantries, connecting the cameras to the CSC. We will employ Avigilon Control Center (ACC) (Enterprise Edition) to manage all video feeds, a software product we are familiar with and has excellent performance. We will meet these sub requirements as follows: 1. ACC Client software will allow all CCTV camera feeds to be easily viewable and storable in the CSC 2. All roadside transactions will be date and time stamped with clocks synchronized using GPS signals, as will the camera, allowing all transactions to be correlated to the video signal for auditing. Camera software to data capture functionality can be used to capture the feed of specific cameras to employ and test this functionality. 3. CCTV identification and password authentication will provide different user and group permissions for site security cameras and for overview cameras. This functionality will be implemented via user & group permissions and login/password within ACC.		
AC-008	It is desired for the live feed of the CCTV roadway camera to be available to the Walk-up Centers.		X
	Proposer Response: The TCS complies with requirement AC-008. Avigilon Control Center (ACC) (Enterprise Edition) supports multiple options for viewing the live feed at different locations, such as Client Software or Virtual Matrix Software with a local (or remote) monitor. ACC also supports Web/Mobile viewing options. [redacted]		
AC-009	The CCTV cameras shall have Pan-Tilt-Zoom control for observation of each Toll Zone. The CCTV cameras shall be mounted in such locations that the full Toll Zone and toll equipment is visible by the CCTV camera. The 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.	X	

Req ID	Access Control and CCTV Requirements (Section AC)	Required	Value Add
	Proposer Response: The TCS complies with requirement AC-009. We will install Pan-Tilt-Zoom cameras near or on each toll gantry in a way that the full toll zone and toll equipment is visible. We will integrate Pan-Tilt-Zoom Control that can be accessed for each camera by authorized users. All digital video streams will be recorded through Avigilon Control Center (ACC) (Enterprise Edition). With our camera control software Avigilon Control Center (ACC) (Enterprise Edition) –Camera record settings are individually configurable to record constantly, or motion only, or record variable reference frames during inactivity and full frame rate on motion and/or alarm events, so we will record periods of inactivity at a lower frame rate per this requirement. Camera live views are always available 24/7 over the network, regardless of recording settings.		
AC-010	The CCTV cameras provided by the Toll System Provider shall be color digital cameras supporting a minimum resolution of 540 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.	X	
	Proposer Response: The TCS complies with requirement AC-0010. We will use Avigilon color cameras. All Avigilon cameras are 1.0MP (1280x720p) or higher. ACC is a well-proven CCTV product that is compatible with a large selection of 3rd-party (ONVIF) cameras, so there are many secondary sources available, and the CCTV system can be expanded/updated over time without modification to any other portion of the TCS. Avigilon cameras provide clear video in daytime and nighttime and other 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.	X	
	Proposer Response: The TCS complies with requirement AC-011. We will provide weatherproof cabinets for associated equipment. Cabinets, boxes, and/or housings will be NEMA rated with a 4 times stainless steel housings and carry a UL listing. Where appropriate and required, camera enclosures will have tamper resistant hardware to avoid vandalism and theft.		
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.	X	
	Proposer Response: The TCS complies with requirement AC-012. Avigilon Control Center (ACC) (Enterprise Edition) includes an administrative application that allows authorized system administrators to configure the access authorizations of the CCTV system. Unlimited client workstations can be connected to the site servers. All settings, data/metadata – events and adjustable pre/post-event motion activity are all stored with the video and are available for playback based on group/individual system/device access privileges		
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.	X	
	Proposer Response: The TCS complies with requirement AC-013. Avigilon Control Center (ACC) (Enterprise Edition) – Server/workstation & Camera Time can be configured to sync to whatever Network Time Protocol (NTP) source is desired, so they will be synchronized in this way. CCTV and DVR equipment will continue to operate in any case of Communication failure. The Network Video Recorder (NVR) Servers are peers and so will function independent of each other. We will employ redundant servers redundancy and failover to provide continuous video recording in case of failure of a single server.		
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.	X	
	Proposer Response: The TCS complies with requirement AC-014. Our cameras will be aimed by default at security relevant zones near cabinets or building doors and shall detect and record movements there. We will mount our cameras such that they can be aimed in 360 degrees of direction. Our cameras will have 180 degrees of tilt, and 10x or greater zoom. An example below:		

Req ID	Access Control and CCTV Requirements (Section AC)	Required	Value Add
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.	X	
	Proposer Response: The TCS complies with requirement AC-015. Digital video Recording is a standard features of Avigilon Control Center (ACC) (Enterprise Edition), and all video is indexed by date/time, as well as camera/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.	X	
	Proposer Response: The TCS complies with requirement AC-016. Avigilon Control Center (ACC) (Enterprise Edition) provides a wide range of recording speeds in frames/sec. ACC provides write-protection on all recordings. Storage time is configurable, and will by default be set to 60 days. Access time to any given video index in the archive is under 2 seconds.		
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.	X	
	Note: It is expected that the Toll Operations Center staff and the Joint Board will be the primary users of these videos. **Proposer Response:** The TCS complies with requirement AC-017. Avigilon Control Center (ACC) (Enterprise Edition) allows access to live and recorded video feeds on any computer connected to the TCS network, or remotely via VPNing into the network – VPN setup & remote access will be provided by the Network Administrator. Authorized users may back any recorded video with selected lane activity data for review that is available in the archive.		
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.	X	
	Proposer Response: The TCS complies with requirement AC-018. Avigilon system recordings are stored in AVE & AVK file format, which contains the H.264/MP4/M-JPEG recorded video streams, all industry-standard formats. These are used for recording/displaying live video as well as for full downloads. Video files can be copied and the copies can be modified without changing the original. Multiple cropping & format options are available for exporting Video/Stills/Data. Video data not marked for archive is automatically purged at a configurable date, which we will by default set to 60 days. Alarms and other critical events will be automatically marked for archive and thus not purged.		
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.	X	
	Proposer Response: The TCS complies with requirement AC-019. Standard features of Avigilon Control Center (ACC) (Enterprise Edition) include full data capture and report of user access (including date/time stamp and camera name); firmware version and date; and camera and DVR configuration. These reports are commercial available from Avigilon [redacted]		
AC-020	It is desired that the CCTV system utilize the latest applicable version of NTCIP 1205 - Object Definitions for Closed Circuit Television (CCTV) Camera Control.		X

Req ID	Access Control and CCTV Requirements (Section AC)	Required	Value Add
	Proposer Response: The TCS complies with requirement AC-020. Avigilon Control Center (ACC) (Enterprise Edition) using Avigilon cameras complies with the latest version of NTCIP 1205 - Object Definitions for Closed Circuit Television (CCTV) Camera Control; the version dated from 2001 and amended November 2004.		
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.	X	
	Proposer Response: The TCS complies with requirement AC-021. We will retain the services of a qualified service provider to maintain the CCTV System. This provider will perform routine inspections and test to assure that the system stays in full operation and mitigate and MTBF based on 10,000 hours of continuous operations. The same service provider will maintain on call emergency response 24 hours per day seven days per week to respond and correct any problems with the CCTV system.		
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.	X	
	Proposer Response: The TCS complies with requirement AC-022. Avigilon Control Center Enterprise software accommodates more than 10 concurrent users without any system degradation.		

TCS Workflows

Req ID	Work Flows (Section WF) All responses to items WF-001 through WF-016 shall describe both Proposer's existing work flows and required development work to meet the Technical Requirements for this Project.	Required	Value Add
WF-001	**Transaction Creation and Processes** The Toll System Provider shall provide System functionality to process Transactions that are created at the Roadside System and sent to a BOS.	X	
	Note: The Proposer shall describe in this Technical Response Form all data available in the System, and specify configurable data available in the System. 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. Proposer shall describe in this Technical Response Form the toll rating design within this workflow. If the toll rating is conducted outside of this work flow, Proposer shall state where the rating is done in the TCS. The Proposer shall describe in this section of the Technical Response Form the toll rating functions and configurability of the toll rating functions regardless of where it resides in the TCS architecture. The Proposer shall describe in this Technical Response Form all operational configurable parameters and system configurable parameters that impact operations. **Proposer Response:** [redacted]		

Req ID	Work Flows (Section WF) All responses to items WF-001 through WF-016 shall describe both Proposer's existing work flows and required development work to meet the Technical Requirements for this Project.	Required	Value Add
	[redacted]		

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[redacted]	[redacted]		

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Req ID	Work Flows (Section WF) All responses to items WF-001 through WF-016 shall describe both Proposer's existing work flows and required development work to meet the Technical Requirements for this Project.	Required	Value Add
	[redacted]		

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Req ID	Work Flows (Section WF) All responses to items WF-001 through WF-016 shall describe both Proposer's existing work flows and required development work to meet the Technical Requirements for this Project.	Required	Value Add
	[redacted]		

Req ID	Work Flows (Section WF) All responses to items WF-001 through WF-016 shall describe both Proposer's existing work flows and required development work to meet the Technical Requirements for this Project.	Required	Value Add
	[redacted]		

Req ID	Work Flows (Section WF) All responses to items WF-001 through WF-016 shall describe both Proposer's existing work flows and required development work to meet the Technical Requirements for this Project.	Required	Value Add
[redacted]	[redacted]		

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	[redacted]		

Req ID	Work Flows (Section WF) All responses to items WF-001 through WF-016 shall describe both Proposer's existing work flows and required development work to meet the Technical Requirements for this Project.	Required	Value Add
	[redacted]	ponsible ue	
	[redacted]	Step 4)	
	[redacted]	Step 4)	
	[redacted]	Step 4)	
	[redacted]	Step 4)	
	[redacted]	Step 4)	

Req ID	Work Flows (Section WF) All responses to items WF-001 through WF-016 shall describe both Proposer's existing work flows and required development work to meet the Technical Requirements for this Project.	Required	Value Add
[redacted]	[redacted]	[redacted]	

Req ID	Work Flows (Section WF) All responses to items WF-001 through WF-016 shall describe both Proposer's existing work flows and required development work to meet the Technical Requirements for this Project.	Required	Value Add
	[redacted]		
WF-002	**Transaction payment processing and settlement** The Toll System Provider shall provide system functionality and operations processes to process Transaction payments and settlements on all account types.	X	
	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. The Proposer shall describe in this Technical Response Form the transaction payment process and settlement work flow, and shall include in such description how partial payments are handled and how exceptions for unpaid or failures to process in the System are identified and resolved for a Transaction. The Proposer shall provide in this Technical Response Form a list of exceptions of payment processing and posting. Examples include a bad credit card on file or how an insufficient payment would escalate to the Violation process. The Proposer shall describe in this Technical Response Form all operational configurable parameters and system configurable parameters that impact operations.		

Req ID	Work Flows (Section WF) All responses to items WF-001 through WF-016 shall describe both Proposer's existing work flows and required development work to meet the Technical Requirements for this Project.	Required	Value Add
	Proposer Response: [redacted]		

Req ID	Work Flows (Section WF) All responses to items WF-001 through WF-016 shall describe both Proposer's existing work flows and required development work to meet the Technical Requirements for this Project.	Required	Value Add
	[redacted]		

Req ID	Work Flows (Section WF) All responses to items WF-001 through WF-016 shall describe both Proposer's existing work flows and required development work to meet the Technical Requirements for this Project.	Required	Value Add
	[redacted]		

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	[redacted]		
WF-003	**Account management system functions (open, close, update accounts)** 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.	X	
	Note: The Proposer shall provide operations and system workflows in this Technical Response Form that describe how accounts are created, updated and maintained in the System. The Proposer shall provide in this Technical Response Form a list of all account types and their functions available in the System including but not limited to ETC Accounts, Registered Video Accounts and Unregistered Video accounts. The Proposer shall also provide in this Technical Response Form a list of configurable fields and functions that can be used by the system operator or customer in interacting with accounts. The Proposer shall describe in this Technical Response Form all operational configurable parameters and system configurable parameters that impact operations. **Proposer Response:** [redacted]		

Req ID	Work Flows (Section WF) All responses to items WF-001 through WF-016 shall describe both Proposer's existing work flows and required development work to meet the Technical Requirements for this Project.	Required	Value Add
[redacted]	[redacted]	[redacted]	[redacted]
WF-004	**Customer service representative customer interactions** 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.	X	
[redacted]	Note: The Proposer shall provide in this Technical Response Form system and operations work flows that illustrate how the customer service representatives interact with the System. This includes but is not limited to account opening, updates of demographic or payment information, escalation of unresolved issues and dealing with an irate customer. The Proposer shall provide in this Technical Response Form a list of existing work flows on how case management is handled within the TCS. Case Management shall include but not be limited to how unresolved customer contacts are escalated until resolved. The Proposer shall describe in this Technical Response Form all operational configurable parameters and system configurable parameters that impact operations. **Proposer Response:** [redacted]		

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	[redacted]		

Req ID	Work Flows (Section WF) All responses to items WF-001 through WF-016 shall describe both Proposer's existing work flows and required development work to meet the Technical Requirements for this Project.	Required	Value Add
	[redacted]		

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	[redacted]		

Req ID	Work Flows (Section WF) All responses to items WF-001 through WF-016 shall describe both Proposer's existing work flows and required development work to meet the Technical Requirements for this Project.	Required	Value Add
[redacted]	[redacted]	[redacted]	[redacted]
WF-005	**Image Review** 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.	X	
	Note: The Proposer shall provide in this Technical Response Form system and operations work flows for the review, identification and disposition of license plate numbers and state jurisdictions including establishment of thresholds for automatic OCR confidence levels, double blind reviews, presentation of the image to the reviewer, aids to complete the correct license plate and jurisdiction to the operator and any other operations quality assurance tools that can aid the operator with		

Req ID	Work Flows (Section WF) All responses to items WF-001 through WF-016 shall describe both Proposer's existing work flows and required development work to meet the Technical Requirements for this Project.	Required	Value Add
	identifying and coding the correct image for post processing. The Proposer shall describe in this Technical Response Form all operational configurable parameters and system configurable parameters that impact operations. **Proposer Response:** [redacted]		

Req ID	Work Flows (Section WF) All responses to items WF-001 through WF-016 shall describe both Proposer's existing work flows and required development work to meet the Technical Requirements for this Project.	Required	Value Add
	[redacted]		

Req ID	Work Flows (Section WF) All responses to items WF-001 through WF-016 shall describe both Proposer's existing work flows and required development work to meet the Technical Requirements for this Project.	Required	Value Add
	[redacted]		

Req ID	Work Flows (Section WF) All responses to items WF-001 through WF-016 shall describe both Proposer's existing work flows and required development work to meet the Technical Requirements for this Project.	Required	Value Add
[redacted]	[redacted]	[redacted]	
WF-006	**Invoice generation and escalation** 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.	X	

Req ID	Work Flows (Section WF) All responses to items WF-001 through WF-016 shall describe both Proposer's existing work flows and required development work to meet the Technical Requirements for this Project.	Required	Value Add
	Note: The Proposer shall provide in this Technical Response Form work flows for invoice escalation leading into the Violation processes including how invoice and Violation documents are generated, printed and mailed to customers and Violators. The Proposer shall provide with this Technical Response Form sample Customer Statements for the Project including any fees (administrative or invoice fees and Violation fines). The Proposer shall describe in this Technical Response Form all operational configurable parameters and system configurable parameters that impact operations. **Proposer Response:** [redacted]		

Req ID	Work Flows (Section WF) All responses to items WF-001 through WF-016 shall describe both Proposer's existing work flows and required development work to meet the Technical Requirements for this Project.	Required	Value Add
	[redacted]		

Req ID	Work Flows (Section WF) All responses to items WF-001 through WF-016 shall describe both Proposer's existing work flows and required development work to meet the Technical Requirements for this Project.	Required	Value Add
WF-007	**Violations processing (post-paid no payment)** 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.	X	
	Note: The Proposer shall provide in this Technical Response Form system and operational work flows for Violation creation, escalation and advancement through initial and final notices including collections, escalation to an administrative hearing process or traffic court process. The Proposer is responsible for the evidentiary package for administrative hearing process and court on the LSIORB Project. The Proposer shall describe all operational and system configurable parameters that can be modified in the system in this Technical Response Form. The Proposer shall also describe in this Technical Response Form available triggers that escalate a Violation in each stage, such as automatic timers and those levels which have manual override or require a manual escalation to the next stage in the Violation. The Proposer shall also describe in this Technical Response Form how Violations escalate for payments below or above partial payment thresholds. The Proposer shall also describe in this Technical Response Form any quality assurance measures that are taken to confirm the Customer Statement prior to being issued to the customer. **Proposer Response:** [redacted]		

Req ID	Work Flows (Section WF) All responses to items WF-001 through WF-016 shall describe both Proposer's existing work flows and required development work to meet the Technical Requirements for this Project.	Required	Value Add
[redacted]	[redacted]	[redacted]	[redacted]
WF-008	**Incoming payments at the Walk-up Center – Credit, Check, Cash** The TCS shall provide system functionality and operational processes to accept credit cards, checks, and cash at the Walk-up Centers.	X	
	Note: The Proposer shall provide in this Technical Response Form work flows for other functions offered at the Walk-up Centers with the Toll System Provider's system. The Proposer shall provide in this Technical Response Form a list of typical exceptions and how the exceptions are resolved operationally or through the system. Examples of exceptions in the context of this requirement are declined credit cards, verification of the identity of the credit card (if applicable), check validation processes or other ways to verify the payment authenticity. The Proposer shall describe in this Technical Response Form all operational configurable		

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	parameters and system configurable parameters that impact operations. **Proposer Response:** [redacted]		
WF-009	**Payment Processing (including lockbox, reversals, payment plans, refunds or mitigated deals)** 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.	X	
	Note: The Proposer shall provide in this Technical Response Form a list of existing work flows with regards to how lockbox payments are posted to the system, how the system or users of the system can issue refunds, reverse Transactions and fees and tolls on an account and how mitigated deals can be made for payment for a customer for all account types. The Proposer shall describe in this Technical Response Form all operational configurable parameters and system configurable parameters that impact operations. **Proposer Response:** [redacted]		

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[redacted]	[redacted]		

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	[redacted]		

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	[redacted]		
WF-010	**Collection agency and court interfaces** 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.	X	
	Note: The Proposer shall provide in this Technical Response Form a list of existing work flows that describe the human to system and system to system interfaces for the implementation of multiple collection agencies, and multiple court or self-imposed adjudication processes. The Proposer shall identify in this Technical Response Form the number of different collection agencies and court jurisdictions that can be interfaced with the System. The Proposer shall also describe in this Technical Response Form the nature of the interfaces with the court systems including the number of evidence package capabilities, tracking capabilities and capabilities to collect data from external systems for reporting into the TCS. The Proposer shall describe in this Technical Response Form all operational configurable parameters and system configurable parameters that impact operations. **Proposer Response:** [redacted]		

Req ID	Work Flows (Section WF) All responses to items WF-001 through WF-016 shall describe both Proposer's existing work flows and required development work to meet the Technical Requirements for this Project.	Required	Value Add
[redacted]	[redacted]		
WF-011	**Customer self-service payments including cash replenishments** 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.	X	

Req ID	Work Flows (Section WF) All responses to items WF-001 through WF-016 shall describe both Proposer's existing work flows and required development work to meet the Technical Requirements for this Project.	Required	Value Add
	Note: The Proposer shall provide a list of work flows for all self-service account functions on the Customer Website and IVR including but not limited to how to open an account, add funds to an account, add, update, and delete a payment method, and dispute tolls. The Proposer shall describe any other self-service functions available in the TCS. The Proposer shall also provide a list of all workflows for cash replenishments including the media used for the cash based solution (i.e. reloadable card, account number only, self-service kiosk or cashier). The Proposer shall describe in this Technical Response Form all operational configurable parameters and system configurable parameters that impact operations. **Proposer Response:** [redacted]		

Req ID	Work Flows (Section WF) All responses to items WF-001 through WF-016 shall describe both Proposer's existing work flows and required development work to meet the Technical Requirements for this Project.	Required	Value Add
	[redacted]		
	[redacted]		
	[redacted]		
	[redacted]		
	[redacted]		

Req ID	Work Flows (Section WF) All responses to items WF-001 through WF-016 shall describe both Proposer's existing work flows and required development work to meet the Technical Requirements for this Project.	Required	Value Add
[redacted]	[redacted]		

Req ID	Work Flows (Section WF) All responses to items WF-001 through WF-016 shall describe both Proposer's existing work flows and required development work to meet the Technical Requirements for this Project.	Required	Value Add
	[redacted]		

Req ID	Work Flows (Section WF) All responses to items WF-001 through WF-016 shall describe both Proposer's existing work flows and required development work to meet the Technical Requirements for this Project.	Required	Value Add
	[redacted]		

Req ID	Work Flows (Section WF) All responses to items WF-001 through WF-016 shall describe both Proposer's existing work flows and required development work to meet the Technical Requirements for this Project.	Required	Value Add
	[redacted]		
WF-012	**Financial Reconciliation within TCS and with external accounting system** 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.	X	
	Note: An accounting system (e.g. general ledger) will be provided by others. The Proposer shall interface with the third-party-provided accounting system and reconcile all Financial Transactions and Traffic Transactions collected and processed by the TCS. The Proposer shall provide in this Technical Response Form workflows on how its TCS reconciles financial data with an external accounting system. The Toll System Provider shall also provide in this Technical Response Form a list of all accounting codes available and typically sent to the accounting system and shall provide the ability to track debits, credits, reversals and		

Req ID	Work Flows (Section WF) All responses to items WF-001 through WF-016 shall describe both Proposer's existing work flows and required development work to meet the Technical Requirements for this Project.	Required	Value Add
	adjustments. The Proposer shall describe in this Technical Response Form the frequency of the data transferred to external systems and typical audit processes and frequency of the audits. The Proposer shall describe in this Technical Response Form all operational configurable parameters and System configurable parameters that impact operations. **Proposer Response:** [redacted]		

Req ID	Work Flows (Section WF) All responses to items WF-001 through WF-016 shall describe both Proposer's existing work flows and required development work to meet the Technical Requirements for this Project.	Required	Value Add
	[redacted]		

Req ID	Work Flows (Section WF) All responses to items WF-001 through WF-016 shall describe both Proposer's existing work flows and required development work to meet the Technical Requirements for this Project.	Required	Value Add
[redacted]	[redacted]		

Req ID	Work Flows (Section WF) All responses to items WF-001 through WF-016 shall describe both Proposer's existing work flows and required development work to meet the Technical Requirements for this Project.	Required	Value Add
	[redacted]		

Req ID	Work Flows (Section WF) All responses to items WF-001 through WF-016 shall describe both Proposer's existing work flows and required development work to meet the Technical Requirements for this Project.	Required	Value Add
[redacted]	[redacted]		

Req ID	Work Flows (Section WF) All responses to items WF-001 through WF-016 shall describe both Proposer's existing work flows and required development work to meet the Technical Requirements for this Project.	Required	Value Add
[redacted]	[redacted]		
WF-013	**TCS incident management** 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).	X	
[redacted]	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. The Proposer shall describe in this Technical Response Form all operational configurable parameters and system configurable parameters that impact operations. **Proposer Response:** [redacted]		

Req ID	Work Flows (Section WF) All responses to items WF-001 through WF-016 shall describe both Proposer's existing work flows and required development work to meet the Technical Requirements for this Project.	Required	Value Add
	[redacted]		

Req ID	Work Flows (Section WF) All responses to items WF-001 through WF-016 shall describe both Proposer's existing work flows and required development work to meet the Technical Requirements for this Project.	Required	Value Add
	This data is used to produce the reports for response times, [redacted]		

Req ID	Work Flows (Section WF) All responses to items WF-001 through WF-016 shall describe both Proposer's existing work flows and required development work to meet the Technical Requirements for this Project.	Required	Value Add
	[redacted]		
WF-014	**TCS monitoring** 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.	X	

Req ID	Work Flows (Section WF) All responses to items WF-001 through WF-016 shall describe both Proposer's existing work flows and required development work to meet the Technical Requirements for this Project.	Required	Value Add
	Note: The Proposer shall include in this Technical Response Form a list of all alarms, whether it is Hardware, Software or System and what triggers the alarm. For example, if the alarm is triggered more than 5 times in 3 minutes, the frequency for a time period shall be provided with the alarm message description. 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. The Proposer shall describe in this Technical Response Form all operational configurable parameters and system configurable parameters that impact operations. **Proposer Response:** [redacted]		

Req ID	Work Flows (Section WF) All responses to items WF-001 through WF-016 shall describe both Proposer's existing work flows and required development work to meet the Technical Requirements for this Project.						Required	Value Add
	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]		
	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]		
	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]		
	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]		
	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]		
	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]		
	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]		
	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]		
	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]		

Req ID	Work Flows (Section WF) All responses to items WF-001 through WF-016 shall describe both Proposer's existing work flows and required development work to meet the Technical Requirements for this Project.						Required	Value Add
	[redacted]							
	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]		
	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]		
	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]		
	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]		

Req ID	Work Flows (Section WF) All responses to items WF-001 through WF-016 shall describe both Proposer's existing work flows and required development work to meet the Technical Requirements for this Project.						Required	Value Add
	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]		
	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]		
	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]		
	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]		
	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]		

Req ID	Work Flows (Section WF) All responses to items WF-001 through WF-016 shall describe both Proposer's existing work flows and required development work to meet the Technical Requirements for this Project.						Required	Value Add
	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]		
	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]		
	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]		
	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]		
	[redacted]							

Req ID	Work Flows (Section WF) All responses to items WF-001 through WF-016 shall describe both Proposer's existing work flows and required development work to meet the Technical Requirements for this Project.	Required	Value Add
	[redacted]		
WF-015	**TCS inter-agency Transaction processing and settlement** The TCS shall provide system functionality and operations processes to interact with other agencies to process, settle and reconcile interoperable Transactions.	X	
	Note: The Proposer shall also describe in this Technical Response Form how the TCS is able to audit all transactions processed by other agencies to be settled on home accounts and how Traffic Transactions within the System are processed for "away customers" who hold an account with another system. The Proposer shall describe in this Technical Response Form all operational configurable parameters and System configurable parameters that impact operations. **Proposer Response:** [redacted]		

Req ID	Work Flows (Section WF) All responses to items WF-001 through WF-016 shall describe both Proposer's existing work flows and required development work to meet the Technical Requirements for this Project.	Required	Value Add
	[redacted]		

Req ID	Work Flows (Section WF) All responses to items WF-001 through WF-016 shall describe both Proposer's existing work flows and required development work to meet the Technical Requirements for this Project.	Required	Value Add
[redacted]	[redacted]		

Req ID	Work Flows (Section WF) All responses to items WF-001 through WF-016 shall describe both Proposer's existing work flows and required development work to meet the Technical Requirements for this Project.	Required	Value Add
	[redacted]		

Req ID	Work Flows (Section WF) All responses to items WF-001 through WF-016 shall describe both Proposer's existing work flows and required development work to meet the Technical Requirements for this Project.	Required	Value Add
	[redacted]		
WF-016	**TCS configuration management** The TCS shall provide system functionality and operations processes to provide configuration management of the Hardware and Software in the TCS.		
	Note: The Proposer shall describe in this Technical Response Form all work flows and its configuration management system to ensure that all systems provide traceability and a clear audit trail of the approved configuration for the operational system. The configuration shall include all operational parameters, system level parameters, Hardware and Software. The Proposer shall describe in this Technical Response Form how changes are made through its configuration control board and how the client (i.e. Joint Board) participates in this configuration control process. The Proposer shall also describe in this Technical Response Form workflows for patch management as well as release management for software patches. The Proposer shall describe in this Technical Response Form all operational configurable parameters and System configurable parameters that impact operations. [redacted]		

Req ID	Work Flows (Section WF) All responses to items WF-001 through WF-016 shall describe both Proposer's existing work flows and required development work to meet the Technical Requirements for this Project.	Required	Value Add
	[redacted]		

Req ID	Work Flows (Section WF) All responses to items WF-001 through WF-016 shall describe both Proposer's existing work flows and required development work to meet the Technical Requirements for this Project.	Required	Value Add
[redacted]	[redacted]		

Req ID	Work Flows (Section WF) All responses to items WF-001 through WF-016 shall describe both Proposer's existing work flows and required development work to meet the Technical Requirements for this Project.	Required	Value Add
	[redacted]		

Req ID	Plans and Testing (Section TP)	Required	Value Add
TP-001	**Roadside System and Network System Plan** 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 **<u>no later than 90 days after NTP.</u>** 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.	X	
	Proposer Response: The Toll System Provider will comply with requirement TP-001. No later than 90 days after NTP, we will provide the Roadside System and Network System Plan. This plan will be broken-down in two parts: one for the roadside system and one for the network system. Both parts will include: • operations and maintenance manuals, • system architecture documents and diagrams, • installation manuals and all external and internal Interface Control Documents, and • a copy of the Software licenses and Hardware cut sheets. At a minimum, the Roadside System plan will include the following contents: 1. INTRODUCTION 1.1. SCOPE 1.2. REFERENCE DOCUMENTS 1.2.1. List of applicable Documents 1.3. ABBREVIATIONS AND ACRONYMS 1.4. DEFINITIONS 2. SYSTEM DESCRIPTION 2.1. FUNCTIONAL OVERVIEW 2.1.1. Definition 2.1.2. Overall Description 2.1.3. Road Side System Breakdown 2.2. PHYSICAL ARCHITECTURE 2.2.1. Road and Gantry Layout 2.2.2. Equipment .2.3. Equipment Interconnection 2.3. COVERAGE ZONES 3. SUBSYSTEM DESCRIPTIONS 3.1. AUTOMATIC VEHICLE IDENTIFICATION SUBSYSTEM (AVI) 3.1.1. Principles 3.1.2. Design Architecture 3.1.3. Antenna installation 3.1.4. AVI Transaction Report Content 3.1.5. Failure management 3.2. AUTOMATIC VEHICLE CLASSIFICATION SUBSYSTEM (AVC) 3.2.1. Principles 3.2.2. Overhead Lasers 3.2.2.1. Vehicle Detection 3.3. VIDEO ENFORCEMENT SYSTEM (VES) 3.3.1. Principles 3.3.2. Architecture 3.3.3. Lane Layout Consideration 3.3.4. Image Acquisition Unit 3.3.5. VES Servers 3.3.6. Triggering consideration 3.4. GANTRY CONTROLLER SYSTEM (GCS) 3.4.1. Principle 3.4.2. Equipment 3.4.3. Correlation Engine 3.4.3.1. Characteristics of the Vehicle Stream 3.4.3.2. Association of AVC Detections 3.4.3.2.1. Laser Scanners 3.4.3.2.2. Inductive Loops 3.4.3.2.3. Combination 3.4.3.3. Association of LPR Detections 3.4.3.4. Association of AVI Data 3.4.3.5. Data Association at Very Low Speed 3.4.3.6. Time Synchronization 3.4.4. Interconnection between the Gantry Controller (GC) and CCS 3.4.5. Monitoring 3.4.5.1. Status and Alarm Management 3.4.5.2. Software 3.4.6. Maintenance Modes 3.4.6.1. Activity Monitoring Mode 3.4.6.2. Inhibition Mode 3.4.6.3. Global Maintenance Mode 4.3. TRANSACTION DATA FLOW 4.4. LOG FILES AND STORED DATA 4.4.1. AVC lasers 4.4.2. AVC loops system 4.4.3. VES4.4.4. AVI readers 3.5. LANE INTERFACE UNIT (LIU) 4. BASIC ROADSIDE PROCESS 4.1. VEHICLE PASSAGE SEQUENCE 4.2. GENERATION OF DATA DURING THE PASSAGE OF VEHICLE 4.3. TRANSACTION DATA FLOW 4.4. LOG FILES AND STORED DATA 4.4.1. AVC lasers 4.4.2. AVC loops system 4.4.3. VES4.4.4. AVI readers 4.4.5. VES servers 4.4.6. Gantry 5. FAULT TOLERANCE AND DEGRADED 5.1.1. Gantry Controller 5.1.2. Possible Failures and Associated System Behavior 6. SOFTWARE UPGRADE 7. DATA PROTECTION 7.1. PHYSICAL SECURITY 7.2. LOGICAL SECURITY 4.4.5. VES servers 4.4.6. Gantry 5. FAULT TOLERANCE AND DEGRADED 5.1.1. Gantry Controller		

Req ID	Plans and Testing (Section TP)	Required	Value Add
	3.2.2.2. Vehicle Classification based on Laser Signal Processing 3.2.3. Inductive Loops 3.2.4. Global Classification 3.2.5. Performances and Fault Tolerance 3.2.6. Alarm generation 3.5. LANE INTERFACE UNIT (LIU) 4. BASIC ROADSIDE PROCESS 4.1. VEHICLE PASSAGE SEQUENCE 4.2. GENERATION OF DATA DURING THE PASSAGE OF VEHICLE 5.1.2. Possible Failures and Associated System Behavior 6. SOFTWARE UPGRADE 7. DATA PROTECTION 7.1. PHYSICAL SECURITY 7.2. LOGICAL SECURITY The Network system plan will be structured similarly to the Roadside system plan given above, but include all relevant topics for the Network System**.**		
TP-002	**Back office System Plan** 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, **no later than 90 days after NTP**. 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.	X	
	Proposer Response: The Toll System Provider will comply with requirement TP-002. No later than 90 days after NTP, the TSP will provide the approved Back Office System Plan. This Plan will 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. At a minimum, the Back Office System Plan will include the following contents:: 1. INTRODUCTION 1.1. Purpose 1.2. References 1.3. Glossary of Terms 2. BACK OFFICE OVERVIEW 2.1. Logical Entities 2.2. Central Computer System (CCS) Overview 2.3. Actors & Roles 2.4. Back Office Breakdown Structure 3. SYSTEM ASSET MANAGEMENT (SAM) 3.1. Toll Point Supervision (TPS) 3.2. Maintenance Online Management System (MOMS) 3.3. Help Desk 3.4. Monitoring and Control 3.5. Backup & Restore 4. CUSTOMER SERVICE CENTER (CSC) 4.1. Toll Admin 4.2. Toll CRM 4.3. Tag Management 4.4. Public Website 4.5. Automated Correspondence 4.6. Statements 4.7. Image Review (TOLL IRW) 4.8. Financial 4.9. Transaction Management 4.10. Contact Center Integration 4.11. Lite CRM 4.12. Mobile Application 5. EXTERNAL INTERFACES (INT) 5.1. Bank 5.2. Credit Card 5.3. Vehicle Registration 5.4. Government Agency 5.5. Interoperability 5.6. Printing House 5.7. Traffic Management 5.8. Account Info 5.9. Collections 5.10. Accounting Package 5.11. Gantry/Lane 5.12. Third Party Payment 6. DATA WAREHOUSE AND REPORTING 6.1. Data Warehouse Data Flow 6.2. Change Data Capture (CDC) 6.3. Extract Transform Load,(ETL) 6.4. Dimensional Data Store 6.5. OLAP Cubes 6.6. Standard Reports 6.7. Ad-Hoc Reports 6.8. Excel Power Pivot 7. CORE ASSET SERVICES (CAS) 7.1. Account Services 7.2. Utility Services 7.3. Security and Cryptography 7.4. Data Access Service 7.5. Exception Service 7.6. CSC Pay 7.7. Key Management 7.8. Purge Archive 7.9. Work Flow 7.10. Address Verification 8. IT INFRASTRUCTURE		
TP-003	**TOC System Plan** The Toll System Provider shall provide a Joint Board-approved TOC System Plan and documentation **no later than 90 days after NTP.** 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.	X	

Req ID	Plans and Testing (Section TP)	Required	Value Add
	Proposer Response: [redacted]		

Req ID	Plans and Testing (Section TP)	Required	Value Add
	[redacted]		
	[redacted] Level 1/2/3		

Req ID	Plans and Testing (Section TP)				Required	Value Add
	[redacted]	[redacted]	[redacted]	[redacted]		
	[redacted]	[redacted]	[redacted]	[redacted]		
	[redacted]	[redacted]	[redacted]	[redacted]		
	[redacted]	[redacted]	[redacted]	[redacted]		

Req ID	Plans and Testing (Section TP)	Required	Value Add
	[redacted]		

Req ID	Plans and Testing (Section TP)	Required	Value Add
	[redacted]		

Req ID	Plans and Testing (Section TP)	Required	Value Add
	[redacted]		
TP-004	**Roadside System and Network Installation Plan** The Toll System Provider shall provide a Joint Board-approved Roadside System and Network Installation Plan **no later than 180 days after NTP.** 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).	X	
	Proposer Response: The Toll System Provider will comply with requirement TP-004. No later than 180 days after NTP, the TSP will provide the approved Roadside System and Network Installation Plan. This Plan will describe the installation approach, proposed installation schedule, configuration parameters schedule, methodology and required contract resources and Joint Board (if applicable) resources in the plan. An example of the Table of Contents of a Roadside System Plan is given below. This is the Table of contents from a Roadside System Plan issued for another of our current projects, and we would use a similar organization for the LSIORB Project 1. INTRODUCTION 1.1. Preface 1.2. Scope 1.3. REFERENCE DOCUMENTS 1.3.1. List of reference Documents 1.3.2. List of applicable Documents 1.4. Abbreviations and Acronyms 2. OVERVIEW AND NAMING RULES 3. EQUIPMENTS FIXED ON THE GANTRY SUPERSTRUCTURE 3.1. Definitions and Conventions 3.2. Antennas 3.2.1. Number 3.2.2. Mechanical Interface 3.2.2.1. 22° Antenna Mechanical Description 3.2.2.2. 30° Antenna Mechanical Description 3.2.2.3. Antenna Mechanical Reference Point Description 3.2.3. Position 3.4. Violation Enforcement System (VES) Units (Cameras) 3.4.1. Number 3.4.2. Mechanical Interface 3.4.3. Position 3.4.4. VES Lighting 3.5. Video Audit System (cameras) 3.5.1. Number 3.5.2. Position 3.5.3. Mechanical Interface 3.5.4. VAS Lighting 4. LANE INTERFACE UNIT (LIU) 4.1. Number of LIU 4.2. Characteristics of LIU 4.3. Position 4.4. Mechanical interface 5. CABLING 5.1. Generalities 5.2. Cables between Toll Equipment Area and LIU 6. LOOPS 6.1. Loops Installation Constraints 6.2. Loops Layout 6.3. Buried Conduits 7. TOLL EQUIPMENT AREA 7.1. Cabinets Pad 7.2. Generator Pad 8. UPS AND GENERATOR 59 9. ANNEX 9.1. Antennas 9.1.1. Antennas positions on the gantry 9.2. Lasers 9.2.1. Lasers positions on the gantry 9.2.2. Lasers connection on the gantry 9.3. VES Units 9.3.1. VES Units positions on the gantry 9.3.2. VES Units connection on the gantry 9.4. Video Audit System Cameras 9.4.1. VAS Cameras positions on the gantry		

Req ID	Plans and Testing (Section TP)	Required	Value Add
	3.3. Lasers 3.3.1. Number 3.3.2. Mechanical Interface 3.3.3. Position 5.3. Cables between LIU and Equipment 5.4. Cables Specifications 9.4.2. VAS Cameras connection on the gantry		
TP-005	**BOS Installation Plan** The Toll System Provider shall provide a Joint Board-approved BOS Installation Plan **no later than 180 days after NTP**. 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.	X	
	Proposer Response: The Toll System Provider will comply with requirement TP-005. No later than 180 days after NTP, the TSP will provide the approved BOS Installation Plan. This Plan will describe the installation approach, proposed installation schedule, configuration parameters schedule, methodology and required contract resources and Joint Board (if applicable) resources in the plan. An example of the Table of Contents of a Back Office System Plan is given below. This is the Table of contents from a BOS Plan issued for another of our current projects, and we would use a similar organization for the LSIORB Project: 1. GENERAL 1.1. Referenced & Applicable Documents 1.1.1. Referenced Documents 1.1.2. Applicable Documents 1.2. Tables 1.3. Abbreviations & Acronyms 1.4. Methodology, Tools & Techniques 2. INTRODUCTION 3. INSTALLATION PHASES 3.1. Introduction 3.2. Planning Phase 3.3. Hardware and Software Installation 3.3.1. Site Preparation 3.3.2. Site Installation Conformance Evaluation 3.3.3. Primary Operations Center Server Room 3.3.4. WorkStation Deployment 3.3.5. Secondary Operation Center 3.4. System Configuration 3.4.1. Domain Establishment 3.4.2. Application Software Deployment 3.4.3. Security Layer Establishment and PCI Compliance 3.4.4. Installation Tasks Specific to the Secondary Operations Center 3.5. Integration and Testing 3.5.1. Contact Centre Deployment 3.5.2. Data Retention 3.5.3. Integration of Primary and Secondary Service Centers 3.5.4. Final Network Configuration 3.5.5. Testing Phase 3.6. START-UP 4. PHASE AND ACTIVITY SEQUENCE 4.1. Phase Overview 4.2. Activities by Phase 5. INSTALLATION MANAGEMENT 5.1. Installation Management Procedures 5.1.1. Maintain Vendor Contact List 5.1.2. Update Bill of Materials Inventory 5.1.3. Maintain Device Checklist 5.1.4. Keep Communication Channels Working in the Organization Chart 5.2. Control of Work & Record Keeping 5.2.1. Purchase Order Management 5.2.2. Master Schedule Maintenance 5.2.3. Weekly Status Reports 5.2.4. Weekly Internal and Contractor Meetings 5.3. Coordination of Other Contractors 5.3.1. Establishment of Project with Key Contractors 5.3.2. Receipt & Review of Design Documents 5.3.3. Integration of Timelines into the Master Schedule 5.3.4. Validation and Quality Assurance of Work Performed by the Contractor		
TP-006	**TCS As-Built System Documentation** The Toll System Provider shall provide Joint Board-approved As-Built System Documentation for the deployed System at the Project **no later than 30 days after the successful completion of the System Acceptance Test** 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.	X	
	Proposer Response: The Toll System Provider will comply with requirement TP-006. No later than 30 days after the successful completion of the Site Acceptance Test, the TSP will provide the approved TCS As-Built System documentation in native format as well as PDF document format. The As-Built System Documentation will 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.		

Req ID	Plans and Testing (Section TP)	Required	Value Add
TP-007	**Training Plan** The Toll System Provider shall provide a Joint Board-approved Training Plan **no later than 180 days after NTP**. 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. 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.	X	
	Proposer Response: The Toll System Provider will comply with requirement TP-007. No later than 180 days after NTP, the TSP will provide the approved Training Plan. The Training Plan will: • provide the list of all training courses planned to be delivered to new and existing staff on the Project; • describe the training facilities, typical training equipment, proposed training for local staff, and provide course outlines for the training program; • include the list of all user manuals; • include the list and description of all user roles and access rights for the TCS. This list will include all users of the TCS including Joint Board Designated Representatives; and • describe where the Joint Board staff will be trained throughout the Contract Term. We will invite the Joint Board and/or its representatives to observe and participate in all elements of the training. • include a list and description of all user roles and access rights for the TCS. This list includes all users of the TCS including Joint Board Designated Representatives. An example of the Table of Contents of a Training Plan is given below. This is the Table of contents from a Training Plan issued for another of our current projects, and we would use a similar organization for the LSIORB Project: 1. GENERAL 1.1. Applicable Documents 1.2. Tables 1.3. Abbreviations and Acronyms 1.4. Methodology, Tools & Techniques 2. INTRODUCTION 2.1. Training Objective 2.2. Scope of Training 2.3. Main group of staff attending to the Training 3. TRAINING OVERVIEW 3.1. Location, Facility and Technical Requirements 3.2. Trainers and Sanef Personnel 3.3. Class Size 3.4. Training language 3.5. Period of Training 3.6. Duration of Training 3.7. Train the Trainers 3.8. Recording 3.9. Attendance and Evaluation 5. TRAINING SESSIONS 5.1. Training Session 1 5.1.1. Description 5.1.2. When ? 5.1.3. Duration and Content 5.2. Training Session 2 5.2.1. Description 5.2.2. When ? 5.2.3. Duration and Content 5.3. Training Session 3 5.3.1. Description 5.3.2. When ? 5.3.3. Duration and Content 6. TRAINING SESSION 1 6.1. Toll Admin Training 6.1.1. Who should attend 6.1.2. Prerequisites 6.1.3. Duration 6.1.4. Learning Objectives 6.1.5. Topics 6.3. TollCRM Training 6.3.1. Who should attend 6.3.2. Prerequisites 6.3.3. Duration 6.3.4. Learning Objectives 6.3.5. Topics 6.3.6. TollCRM Account Management 6.3.7. TollCRM Automated Correspondence 6.4. Tag Management Training 6.4.1. Who should attend 6.4.2. Prerequisites 6.4.3. Duration 6.4.4. Learning Objectives 6.4.5. Topics 6.5. Lite CRM Training 6.5.1. Who should attend 6.5.2. Prerequisites 6.5.3. Duration 6.5.4. Learning Objectives 6.5.5. Topics		

Req ID	Plans and Testing (Section TP)	Required	Value Add
	3.10. Training Evaluation 4. TRAINING DETAILS 4.1. Training Method 4.2. Training Materials 4.3. Training by Team 4.3.1. Management Team 4.3.1.1. Description 4.3.1.2. Pre-requisites for training 4.3.2. Operation Team 4.3.2.1. Description 4.3.2.2. Pre-Requisites for training 4.3.3. Maintenance Team 4.3.3.1. Description 4.3.3.2. Pre-requisites for training 6.2. Data Warehouse Training 6.2.1. Who should attend 6.2.2. Prerequisites 6.2.3. Duration 6.2.4. Learning Objectives 6.2.5. Topics16 6.6. Contact Centre Training 6.6.1. Who should attend 6.6.2. Prerequisites 6.6.3. Duration 6.6.4. Learning Objectives 6.6.5. Topics 6.7. MOMS Training 6.7.1. Who should attend 6.7.2. Prerequisites 6.7.3. Duration 6.7.4. Learning Objectives 6.7.5. Topics 7. TRAINING SESSION 2 8. TRAINING SESSION 3		
TP-008	**TCS Project Management Plan** 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 **no later than 90 days after NTP**. 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.	X	
	[redacted]		

Req ID	Plans and Testing (Section TP)	Required	Value Add
	[redacted]		
TP-009	**Safety Plan** The Toll System Provider and each Major Subcontractor shall submit a Joint Board-approved Safety Plan **no later than 90 days after NTP**. 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.	X	
	Proposer Response: The Toll System Provider will comply with requirement TP-009. No later than 90 days after NTP, the TSP will provide the approved Safety Plan. This plan will address how Sanef will conduct its work using safe methods and will describe how safety is communicated with its employees, how safety audits are completed and any other information necessary to perform Work on the Project. An example of the Table of Contents of a Health and Safety Plan is given below. This is the Table of contents from a Health and Safety Plan issued for another of our current projects, and we would use a similar organization for the LSIORB Project: 1. INTRODUCTION 1.1. Purpose 1.2. Applicability 1.3. References 1.3.1. List of reference documents 1.3.2. List of applicable documents 1.4. Glossary of terms 2. SAFETY POLICY 3. PROJECT ROLES AND RESPONSIBILITIES 3.1. Sanef safety manager 3.2. Site manager or his appointed representative 3.3. All Sanef employees 3.4. Subcontractors 4. SUPERVISION 5. INSPECTIONS 6. REPORTING 7. TASK PREPARATION 8. GENERAL SITE RISKS AT THE ROADSIDE 9. TOLL ZONE/ POC / SOC SITE ACCESS 10. Schedule A – Example of task sheet 11. Schedule B – Example of risk register 12. Schedule C – Toll Zones access and contact information 12.1. Toll Zones access and location 12.2. Gantry access 12.3. contact information		

Req ID	Plans and Testing (Section TP)	Required	Value Add
TP-010	**System Configuration and Management Plan** The Toll System Provider shall provide a Joint Board-approved System Configuration and Management Plan **no later than 90 days after NTP**. 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.		
	Proposer Response: The Toll System Provider will comply with requirement TP-010. No later than 90 days after NTP, the TSP will provide the approved System Configuration and Management Plan. This plan will describe: • how Hardware, Software and system configuration settings will be managed from Tolling Readiness through the Operations and Maintenance Term, • how any change is identified, documented, controlled and verified during the Installation Work and the Operations and Maintenance Term, and • how any change is submitted to the Joint Board for review and approval pursuant to the Approval Process. An example of the Table of Contents of a System Configuration and Management Plan is given below. This is the table of contents from a Configuration and Maintenance plan from another of our current projects, and we would use a similar organization for the LSIORB Project: 1. GENERAL 1.1. Objectives of this document 1.2. Scope 1.3. Applicable and Reference Documents 1.3.1. List of reference documents 1.3.2. List of applicable documents 1.3.3. Forms 1.4. Terminology 2. CONFIGURATION MANAGEMENT PROCESSES 2.1. Configuration management activities 2.2. Configuration management responsibilities 2.3. Configuration management lifecycle 3. CONFIGURATION IDENTIFICATION 3.1. Configuration Baselines 3.1.1. Functional Baseline 3.1.2. Product Baseline 3.2. Configuration Items 3.2.1. Introduction 3.2.2. Document Identification 3.2.3. Hardware Item Identification 3.2.4. System Software Item Identification 3.2.5. Software Item Identification 3.2.6. COTS Software Item Identification 4. CONFIGURATION CONTROL 4.1. Overview 4.2. Configuration control authorities 4.2.1. Configuration Work Group (CWG) 4.2.2. Change Control Board (CCB) 4.3. Control of Technical Events 4.3.1. Technical Event Definition 4.3.2. Analysis and classification of a Technical Event 4.3.3. Action proposal to a Technical Event 4.3.4. Anomalies 4.3.4.1. Event Report 4.3.4.2. Severity and Priorities for anomalies up to SAT 4.3.4.3. Severity and Priorities for anomalies after SAT 4.4. Engineering Change Control 4.4.1. Tolling Work Change (TWC) 4.4.2. Engineering Change Request (ECR) 4.4.3. Engineering Change Proposal (ECP) 4.4.4. Tolling Work Change 4.4.5. Notice of Revision 4.5. Deviation / Waiver 4.6. Management of changes on site 5. CONFIGURATION STATUS ACCOUNTING 5.1. Document status register 5.2. Nomenclature 5.3. Bill of material (BOM) 5.4. Software release note 5.5. System configuration status 6. CONFIGURATION AUDITS 6.1. Functional Configuration Audit 6.2. Physical Configuration Audit 6.3. Configuration Management System Audit		
TP-011	**Maintenance and Support Plan** The Toll System Provider shall provide a Joint Board-approved Maintenance and Support Plan **no later than 180 days after NTP**. 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.	X	
	Proposer Response:		

Req ID	Plans and Testing (Section TP)	Required	Value Add
	The Toll System Provider will comply with requirement TP-011. No later than 180 days after NTP, the TSP will provide the approved Maintenance and Support Plan. This plan will describe • How Sanef will conduct preventative and corrective maintenance and support activities for the Roadside System and the BOS. • How preventative maintenance, corrective maintenance, Spare Parts and inventory management are carried out • How Sanef will manage Operations and Maintenance Work for the System. • How Sanef will meet all Performance Requirements, priority response and repair times for each item • The organization chart and notifications for incidents • The description of how MOMS is used to track incidents through resolution Sanef intends to submit one MSP for the entire system. An example of the Table of Contents of a Maintenance and Support Plan is given below. This is the Table of contents from a Maintenance and Support Plan issued for another of our current projects, and we would use a similar organization for the LSIORB Project: 1. GENERAL 1.1. Referenced & Applicable Documents 1.1.1. Referenced Documents 1.1.2. Applicable Documents 1.2. Figures 1.3. Tables 1.4. Terminology 1.5. Abbreviations & Acronyms 1.6. Methodology, Tools & Techniques 2. INTRODUCTION 3. APPROACH TO MAINTENANCE 3.1. Maintenance Management Approach 3.1.1. Preventive Maintenance 3.1.2. Corrective Maintenance 3.1.3. Maintenance Service Manual 3.2. Maintenance Management Goals 3.2.1. Response/Repair Times for Maintenance 3.2.2. System Performance Requirements 3.3. System Availability & Reported Measurement 4. MAINTENANCE STAFFING & WORK SCHEDULES 4.1. Maintenance Committee 4.2. Maintenance Team 4.3. Types of Maintenance 4.3.1. Preventive Maintenance 4.3.1.1. Roadside System 4.3.1.2. Back Office System 4.3.1.3. Changeable Message Sign 4.3.1.4. CCTV 4.3.1.5. Other Preventive Maintenance actions 4.3.2. Corrective Maintenance 4.3.2.1. Hardware Corrective Maintenance 4.3.2.1.1. Roadside System 4.3.2.1.2. Back Office System 4.3.2.1.3. Changeable Message Sign 4.3.2.1.4. CCTV 4.3.2.1.5. Other Corrective Maintenance actions 4.3.2.2. Software Corrective Maintenance 4.4. Maintenance Workflow for Hardware Steps 4.4.1. Emergency Issues 4.4.2. Major Issues 4.4.3. Minor Issues 4.5. Maintenance Workflow for Software Steps 4.5.1. Problem Identification 4.5.2. Issue Creation and Assignment 4.5.3. Issue Resolution and Deployment 4.6. Control of Maintenance Work & Record Keeping 4.6.1. Issue Management 4.6.2. Work Order Management 5. INCIDENT & ISSUE TRACKING 5.1. Help Desk Incident and Centralized Issue Tracking Overview 5.2. Database 5.3. Responsibility Assignment Matrix (RACI) 5.4. Components and Actors 5.4.1. Roadside System Issue Tracking 5.4.2. Central Monitoring Server 5.4.3. Issue Resolution Tracking 5.4.4. Tolling Operator User 5.4.5. Tolling Operator Support Team Management 5.4.6. IFA Management 5.4.7. Web Contractor 6. HELP DESK AND CENTRALIZED ISSUE TRACKING (CIT) TOOL 6.1. Help Desk Tool 6.2. CIT Tool 6.2.1. CIT Issue Creation 6.2.2. CIT Notification 6.2.3. CIT Escalation Rules 6.2.4. CIT Reporting 7. SPARE PARTS 7.1.1. Roadside System Spare Parts 7.1.2. Back Office System Spare Parts 7.1.3. Changeable Message Sign Spare Parts 7.1.4. CCTV Spare Parts 7.1.5. Contact Center Subsystem (CTS) Spare Parts 7.1.6. Spare Part Replenishment 7.1.7. Spare Storage Management 8. LANE CLOSURES		

Req ID	Plans and Testing (Section TP)	Required	Value Add
TP-012	**Transition Plan** The Toll System Provider shall provide a Joint Board approved Transition Plan **no later than 180 days after NTP**. 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.	X	
	Proposer Response: The Toll System Provider will comply with requirement TP-012. No later than 180 days after NTP, the TSP will provide the approved Transition Plan. This plan will: • Describe how the System will be transitioned from test environments to production using the testing approach described in the Technical Requirements. • Include all resources, scheduling and detailed step by step transition procedures for the overall System transition from test environments to production An example of the Table of Contents of a Transition Plan is given below. This is the Table of contents from a Transition Plan issued for another of our current projects, and we would use a similar organization for the LSIORB Project. 1. GENERAL 1.1. Referenced & Applicable Documents 1.1.1. Referenced Documents 1.1.2. Applicable Documents 1.2. Figures 1.3. Tables 1.4. Terminology 1.5. Abbreviations & Acronyms 1.6. Methodology, Tools & Techniques 2. RISKS AND CONTINGENCIES 3 STRATEGIES 4. TRANSITION SCHEDULE, TASKS AND ACTIVITIES 4.1 Logical work breakdown. 4.2 Testing and verification activities 4.3 Contingency plans and work-around(s) in the event problems arise. 4.4 Specific activities related to the existing and/or new equipment,. 4.5 Specific activities related to existing, and/or upgraded software 4.6 Systems and/or data back-up(s), conversion plans, 4.7 Hand-off(s) between parties. 4.8 Communication(s) to client 4.9 Transition review 5. TRANSITION RESOURCES 5.1 Software 5.2 Hardware 5.3 Personnel 5.4 Facilities 5.5 Other (Special) Resources 6. REPORTING AND COMMUNICATION PROCEDURES 7. TRANSITION ACCEPTANCE 8. MANAGEMENT CONTROLS 9. CONFIGURATION CONTROL 10. TRANSITION TEAM 11. POST-IMPLEMENTATION		
TP-013	**Third Party Manuals and Documentation** 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 **no later 180 days of NTP to review and download**. The Toll System Provider shall update these documents as required no less frequently than every 180 calendar days.	X	
	Proposer Response: The Toll System Provider will comply with requirement TP-013. No later than 180 days after NTP, the TSP will provide standard, commercially available, updated documentation for third-party provided Hardware, Software, and services for review and download on a Sanef-provided shared collaboration site. Sanef will maintain and/or update this set of manuals no less frequently than every 180 calendar days. Sanef will maintain this set of Manuals on a shared collaboration site.		
TP-014	**End of Contract Transition Plan** The Toll System Provider shall provide a Joint Board approved End of Contract Transition Plan **at the completion of the System Acceptance Test**. 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.	X	
	Proposer Response: The Toll System Provider will comply with requirement TP-014. At the Completion of the System Acceptance Test, the TSP will provide a Joint Board approved End of Contract Transition Plan. To achieve this, Sanef will work out a schedule for review of the End of Contract Transition plan with the Joint		

Req ID	Plans and Testing (Section TP)	Required	Value Add
	Board. This Plan will: • 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. • 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 Plan shall take into account special considerations related to the commingled facility. Sanef will update this plan no less frequently than annually after approval.		
TP-015	**Business Rules and Operational Requirements (BROR)** The Toll System Provider shall provide an initial BROR for the Project **no later than 90 days after NTP**. 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 **shall be updated 180 days prior to the Tolling Readiness Date and again 90 days after the System Acceptance Test is successfully completed.** 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.	X	
	Note: The Joint Board will make itself available to discuss the Business Rules with the TSP during the Business Rule development period. **Proposer Response:** [redacted]		

Req ID	Plans and Testing (Section TP)	Required	Value Add
	[redacted]		
TP-016	**Monthly Project Management Report and Meeting** 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. **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.** The Toll System Provider Project Manager - Installation shall attend this meeting in person.	X	
	Proposer Response: The Toll System Provider will comply with requirement TP-016. Every month of the Contract Term, the Toll System Provider will deliver a Joint Board approved Monthly Project Management Report at least 3 business days before the Project management review meeting with the Joint Board. This Report will: • describe 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; • include an updated resource loaded GANTT schedule delivered in MS project and delivered in PDF which shall reflect current staff and progress measured against the baseline schedule; • 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; • provide a written corrective action plan that describes how and when the Toll System Provider will recover to meet the baseline approved Project schedule if and when the Toll System Provider is behind schedule or upon the request of the Joint Board,; We will 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. An example of the Table of Contents of a Monthly Progress Report is given below. This is the Table of contents from a Monthly progress report issued for another of our current projects, modified slightly for the LSIORB Project. We will modify it further based on the feedback of the Joint Board: 1. MAIN EVENTS / ISSUES DURING THE PERIOD 1.1. Main Project Events / Issues 1.2. Other Project Events / Issues 1.3. Project Changes 2. OTHER ITEMS 2.1. Contract schedule 2.2. Progress 2.2.1. Roadside System 2.2.1.1. Progress Indicator 2.2.1.2. Details 2.2.2. Back Office System 2.2.2.1. Progress Indicator 2.2.3. Changeable Message Signs 2.2.3.1. Specification 2.2.3.2. Demo Integration 2.2.3.3. Open Issues 2.2.4. CCTV 2.2.4.1. Specification 2.2.4.2. Open Issues 2.3. Status of open reading registers (RDF) received from Joint Board 2.3.1. RDF Pending 2.3.2. RDF Received – To be answered by Sanef 2.4. Risk Register 2.5. Action List 3. DOCUMENT CONTROL 4. ANNEX 1 - PROJECT REGISTER 4.1. Schedule 4.2. Work Change 4.3. Detailed Progress Indicators 4.4. Procurement 4.5. Installation 4.6. Placement of Subcontracts 4.7. Action Register 4.8. Correspondence Register 4.8.1. Received from Joint Board 4.8.2. Sent to Joint Board		

Req ID	Plans and Testing (Section TP)	Required	Value Add
	2.2.2.2. Details 2.2.2.3. Demonstration 2.6. Next Steps (3 Coming Months)		
TP-017	**Quality Management Plan (QMP)** The Toll System Provider shall provide a Joint Board approved Quality Management Plan **no later than 90 days after NTP**. 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. 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.	X	
	Proposer Response: The Toll System Provider will comply with requirement TP-017. No later than 90 days after NTP, the TSP will provide the approved Quality Management Plan. This plan will: • Describe how the Toll System Provider manages the quality assurance and quality controls throughout the Contract Term; • 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; • Address handling of materials and control of records on the Project; • Describe how we will conduct audits to ensure the efficient and complete performance of the Work and other obligations of the TSP under the Contract. • 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. • Document the quality assurance program We will develop and maintain a Quality Assurance and Quality Control (QA/QC) program to ensure we always comply with all requirements and obligations in the Contract. We will address the QA/QC plan will be documented in the QMP. We will also address the Quality Assurance Program in a quality assurance section of the Monthly Project Management Report provided to the Joint Board. An example of the Table of Contents of a Quality Management Plan is given below. This is the Table of contents from a Quality Management Plan issued for another of our current projects modified slightly for the LSIORB Project: 1. INTRODUCTION 1.1. Purpose 1.2. Applicability 1.3. References 1.3.1. List of reference documents 1.3.2. List of applicable documents 1.4. Glossary Of Terms 2. QUALITY MANAGEMENT PLAN CONSIDERATIONS 2.1. Responsibilities 2.1.1. QMP Design 2.1.2. QMP Verification 2.1.3. QMP Approval 3.3.1. The Project Quality Manager's (PQM) Responsibilities 3.3.2. The Subcontractor Quality Manager's Responsibilities 3.3.3. Project Manager (PM) 3.3.4. Project Team 3.4. Quality Monitoring And Reporting 4. QUALITY ASSURANCE METHODS AND PROCEDURES 4.1. Quality Training 4.2. Subcontractors Quality Assurance 4.3. Formal Reviews 4.4. Inspections 5. QUALITY PLANNING 5.1. Control Of Project Management Process 5.2. Document Control 5.3. Control Of Sub-Contractors And Purchasing 5.3.1. Subcontractor Control and Compliance 5.3.2. Vendor & Supplier Quality Control 5.4. Control of Work Processes 5.5. Control of Configuration Management Process 5.6. Control of Non-Conforming Product 5.7. Control of Storage And Handling 6. PREVENTIVE AND CORRECTIVE ACTIONS 7. QUALITY ASSURANCE RECORDS		

Req ID	Plans and Testing (Section TP)	Required	Value Add
	2.1.4. QMP Dissemination 2.1.5. QMP Updating 2.2. Lack of Adherence Procedure 3. ORGANIZATION 3.1. Sanef Quality Organization 3.2. Quality Management System 3.3. Project Quality Organization 4.5. Quality Audits 4.5.1. Internal Audit 4.5.2. External Audit 4.5.3. Subcontractors Audit 4.6. Joint Board's satisfaction monitoring		
TP-018	**Configuration and Change Management Plan** The Toll System Provider shall provide a Joint Board approved Configuration and Change Management plan **no later than 90 days after NTP.** 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.	X	
	Proposer Response: The Toll System Provider will comply with requirement TP-018. No later than 90 days after NTP, the TSP will provide the Joint Board approved Configuration and Change Management Plan as part of the System Configuration and Management Plan. This Part of the System Configuration and Management Plan will: • 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; and • 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. An example of the Table of Contents of a Configuration and Change Management Plan is given in the Table of Contents of a System Configuration and Management Plan Chapter 4.(Cf. TP-010) 4. CONFIGURATION CONTROL 4.1. Overview 4.2. Configuration control authorities 4.2.1. Configuration Work Group (CWG) 4.2.2. Change Control Board (CCB) 4.3. Control of Technical Events 4.3.1. Technical Event Definition 4.3.2. Analysis and classification of a Technical Event 4.3.3. Action proposal to a Technical Event 4.3.4. Anomalies 4.3.4.1. Event Report 4.3.4.2. Severity and Priorities for anomalies up to SAT 4.3.4.3. Severity and Priorities for anomalies after SAT 4.4. Engineering Change Control 4.4.1. Tolling Work Change (TWC) 4.4.2. Engineering Change Request (ECR) 4.4.3. Engineering Change Proposal (ECP) 4.4.4. Tolling Work Change 4.4.5. Notice of Revision 4.5. Deviation / Waiver 4.6. Management of changes on site		
TP-019	**Master Testing and Commissioning Plan** The Toll System Provider shall provide a Joint Board-approved Master Testing and Commissioning Plan (MTCP) **no later than 90 after NTP**. 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-024 outlined below.	X	
	Proposer Response: [redacted]		

Req ID	Plans and Testing (Section TP)	Required	Value Add
	[redacted]		

Req ID	Plans and Testing (Section TP)	Required	Value Add
TP-020	**Baseline Test** 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. The Baseline Test Plan shall, at a minimum, encompass the following areas: 1. Roadside System Transaction creation, processing 2. System Monitoring and incident management (MOMS) 3. Image Review 4. IVR 5. BOS ETC and Violations account management 6. BOS, credit cards, Violations, collections and court processes 7. Payment processes and exception management 8. Toll Operations Center including all interfaces 9. Payment processing for all available payment methods 10. Customer Website 11. Disaster recovery including failover of the BOS and CSC.	X	
	Proposer Response: The Toll System Provider will comply with requirement TP-020. We will conduct this baseline Test at the Toll System Provider's test facility. The baseline test will demonstrate the end-to-end functionality of the System to the extent possible in its current state. As in the case of the Factory Acceptances Tests we have conducted for another and similar projects, we will use the real, external interfaces wherever possible, or simulated external interfaces where necessary in this test phase with the agreement of the Joint Board got at the time of the approval of the Test Plan. The Test will Include component level testing to demonstrate compliance with the Technical Requirements for the following areas: 1. Roadside System Transaction creation, processing with a sensors simulator 2. System Monitoring and incident management (MOMS) 3. Image Review 4. IVR 5. BOS ETC and Violations account management 6. BOS, credit cards, Violations, collections and court processes 7. Payment processes and exception management 8. Toll Operations Center including all interfaces 9. Payment processing for all available payment methods 10. Customer Website 11. Disaster recovery including failover of the BOS and CSC	T	
TP-021	**Pre-Production Controlled Test** 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	X	

Req ID	Plans and Testing (Section TP)	Required	Value Add
	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.		
	Proposer Response: The Toll System Provider will comply with requirement TP-021. After the configuration of the external interfaces and Business Rules for the TCS, we will conduct a System Production Readiness Test using the Baseline Test procedures. This test will use all the intended, configured interfaces for the System, with the exception of the Roadside System at the Project sites. For the Roadside System test, we will conduct it at the Toll System Provider test facility using a minimum of four configured and tuned Equipment Lanes and vehicles running at speeds from 0 MPH to 65 MPH. This test will include specific testing of the Kapsch ETC equipment in a multi-lane free-flow (AET) environment focusing on the performance of the 18000-6C tags with a fleet of vehicles equipped with E-Z Pass and 18000-6C tags to ensure performance is met.. This test will employ a variety of license plates from Kentucky, Indiana, and neighboring states to verify the performance of the ALPR sub-system. Network connectivity from the test facility to the BOS will be different, and we will be prepared to illustrate how the difference in network connectivity impacts the results of the test.		
TP-022	**System Production Readiness Test** 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. The first available Toll Zone full configuration may be used for this test. 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: 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. 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 that Transaction to the appropriate Transaction route in the BOS solution. 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. The Toll System Provider is prepared to collected 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 Network communications have been tested and are successfully operating. All required interfaces and file transfers have been tested and are successfully operating for required interfaces, including interoperable interfaces. 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 IVR and Customer Website must be operational at the time of Tolling Readiness 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. All Correspondence capabilities will be reviewed, verified and validated including the • Ability to process all types of invoicing including pay by plate, 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, and • Timeliness.	X	

Req ID	Plans and Testing (Section TP)	Required	Value Add
	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. Media data submission and reporting has been developed and agreed to by the Joint Board and the Toll System Provider for daily submission upon opening, weekly submissions in the future as agreed to by the Joint Board and monthly submissions as agreed to by the Joint Board.		

	Proposer Response: The Toll System Provider will comply with requirement TP-022. We have conducted similar preliminary site tests named "SAT 1," for example on the Port Mann project. We will conduct the System Production Readiness Test for the Roadside System at the first Toll Zone that is available in its full configuration, after it has been tested internally and we have tuned the antennas and other equipment for high performance. We will conduct the System Production Readiness Test using the Pre-Production Controlled Test procedures, but without use of any simulators and with all final components required for revenue service and using the Project Toll Zone(s) and vehicles and customer accounts at the LSIORB Project Toll Zones in Kentucky or Indiana. The System Production Readiness test will demonstrate that 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, and provide customer service operations.
	
	More specifically, the System Production Readiness Test will demonstrate that:
	• 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;
	• Eleven hundred (1100) Transactions of varying types encompassing all Transaction types have occurred through either Transponder identification or license plate identification from the Roadside System equipment, have successfully been processed through the Roadside System, and then have successfully been moved to the appropriate Transaction route (processed) in the BOS solution, including the OCR process and where necessary the manual review process, and posted to either a known account or a new, unregistered account, for which the system will proceed to identify the appropriate vehicle owner through DMV lookup or other means;
	• We are prepared to collected data per the agreed upon methodology upon Revenue Service, including calculating KPIs in the SLA and reporting to the Joint Board;
	• Network communications are successfully operating;
	• All the TCS interfaces are successfully operating;
	• The Customer Service Center (CSC), IVR and Customer Website are operational, capable of providing all required customer service center functions, and comply with Business Rules and PCI DSS rules and regulations;
	• All cash handling operations comply with all rules and regulations as well as all other payment processing procedures;
	• All Correspondence capabilities have been checked and validated including the:
	  ○ Ability to process all types of invoicing including pay by plate, Violations, collections and final collection process through court documentation preparation and procedures;
	  ○ Ability to process Customer Website Correspondence; and
	  ○ Ability to process different types of Transactions by IVR, process payments, process Violations and validate the IVR system;
	• All TCS reporting and monitoring modules 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 checked; and
	• Reporting formats and contents have been developed and agreed by the Joint Board.
	• The system processes roadside transactions, account transactions, and other functions in a timely way.
	
	The System Production Readiness Test will demonstrate also t Sanef has developed Media data submission and reporting and that the Joint board has agreed these for daily submission. After the facilities open, we will plan for weekly submissions and monthly submissions as agreed to by the Joint Board.		

Req ID	Plans and Testing (Section TP)	Required	Value Add
TP-023	**Operations Tests** 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 Tests shall verify the following elements on a weekly basis be submitted no more than 2 business days after the conduct of the test. The Operations Test requirements shall be addressed in the MTCP but should include the following at a minimum: 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. 2. Test IVR to make payments, and exercise the IVR tree to ensure information is available to the customer per the specified Business Rules. 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. 4. Validate payment processing for credit cards, checks, retail cents, and lockbox posting. 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. 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. 7. Confirm all interoperable accounts and Transactions are posting in accordance with E-ZPass rules and funds are reconciled within the TCS. 8. Monitor and record all incidents, and report all priority 1 incidents to the Joint Board with resolution plan including a root cause analysis.	X	
	Proposer Response: The Toll System Provider will comply with requirement TP-023. We have conducted similar tests with controlled and live traffic, for example on the Dublin M50 project. Sanef will conduct four Operations Tests: i) The BOS, CSC, TOC operations test, ii) The Temporary Downtown Traffic Configuration, iii) The East End Bridge, and iv) The Final Downtown Traffic Configuration. The duration of these Operations Tests will be a minimum of 120 days after the commencement of Revenue Service for each Bridge including the BOS. Each Operations Test will 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 Operations Tests will validate and confirm the following elements on a weekly basis: 1. That in at least 10 production accounts selected by the States' Parties, Transactions are created, posted and processed according to requirements. Transactions will include a comparable number of both ETC and Image Transactions. 2. That the IVR makes payments and exercises the IVR tree to ensure information is available to the customer per the specified Business Rules. 3. That the Customer Website is available to validate invoice information and makes payments, and that it is operating in accordance with the Business Rules and requirements. 4. That payment processing for credit cards, checks, retail cents, and lockbox posting is fully functional and operating correctly. 5. That violation escalations, invoice information presented on the accounts, and escalation to collections and court are all functional and operating correctly. We may manually adjust the escalation configurable periods used for collections and court, but we will use the escalated configurable periods for Customer Statements using the configured production System times. 6. That 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. 7. That all interoperable accounts and Transactions are posting in accordance with E-ZPass rules and funds are reconciled within the TCS. 8. That all incidents are monitored and recorded, and that all priority 1 incidents are reported to the Joint Board with a resolution plan including a root cause analysis. We will submit the Test Report no more than 2 business days after the completion of the test.		

Req ID	Plans and Testing (Section TP)	Required	Value Add
TP-024	**System Acceptance Test (SAT)** 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 0020-0024 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. In order for SAT to be requested and agreed upon by the Joint Board, SAT will be performed after all outstanding trouble tickets have been resolved; all prior operational component testing is complete as outlined in Technical Requirements TP-020, TP-021, TP-022, TP-022, and TP-023 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.		
	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.		

Req ID	Plans and Testing (Section TP)	Required	Value Add
	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.		

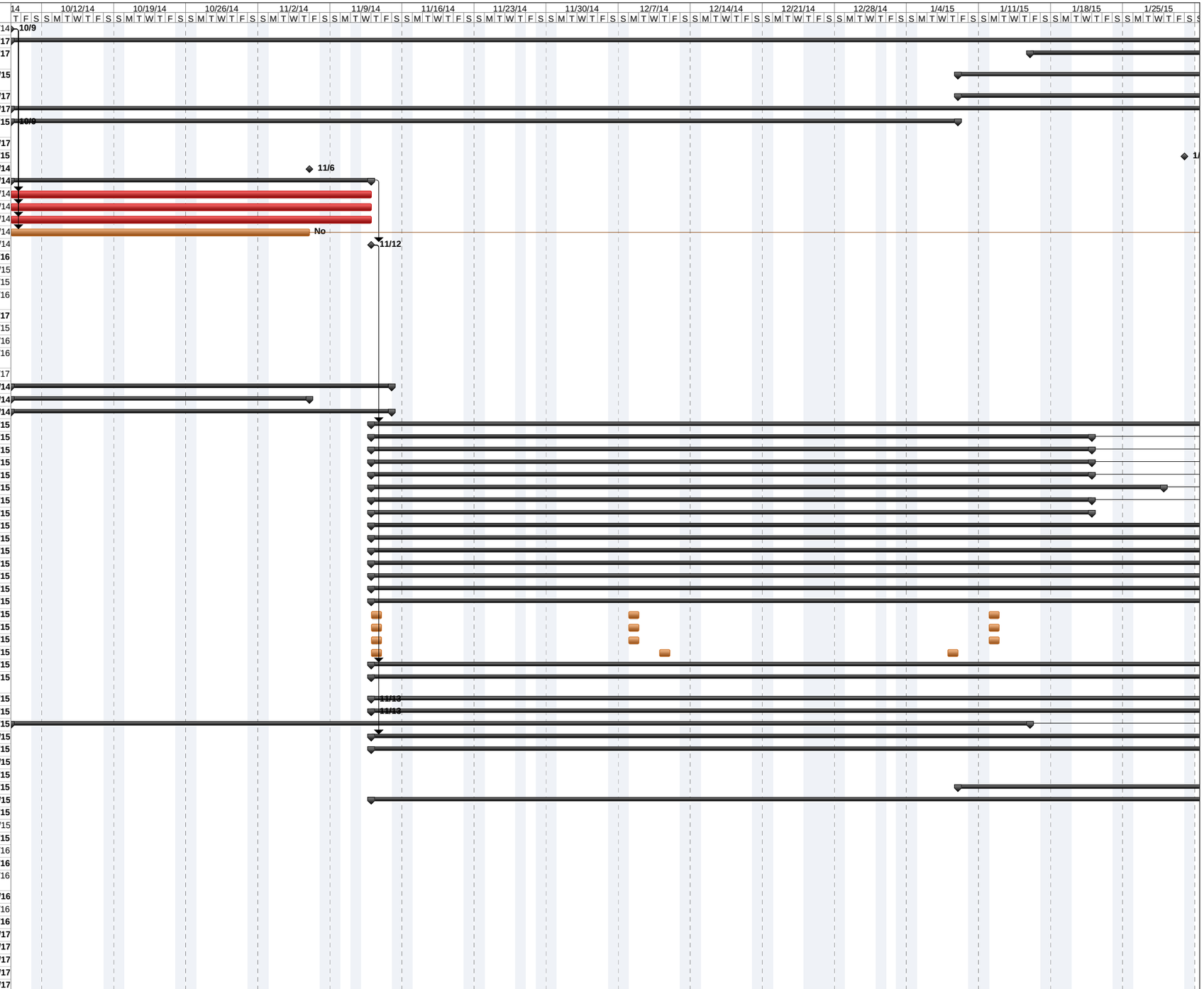
	Proposer Response: The Toll System Provider will comply with requirement TP-024. We have conducted similar System Acceptance Tests, for example on the Port Mann Project. We understand that the purpose of the System Acceptance Test will be to validate that the Roadside System equipment identifies the 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. We further understand that the 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. We will initiate the SAT after:
	• all outstanding trouble tickets have been resolved; all prior testing is complete i.e. the Baseline Test, Pre-Production Controlled Test, System Production Readiness Test, and Operations Tests
	• an established and agreed-upon methodology has 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.
	System Acceptance Test will verify that:
	• Each component of the TCS is available and performing to the required Performance Requirements.
	• All processes and work flows are operating including but not limited to WF-001 through WF-016.
	• The TCS complies with all Business Rules.
	• System network and system architecture requirements have been successfully implemented, completed, tested, validated and performing and are available for use by the Joint Board's TCS.
	• The response to potential network and communications failure.
	• The disaster recovery systems and the Disaster Recovery System Plan operate correctly.
	• 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, 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, 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 the timeliness and responsiveness of operation and maintenance staff.
	• All Correspondence capabilities have been checked and validated including the
	  ○ Ability to process all types of invoicing including pay by plate, Violations, collections and final collection process through court documentation preparation and procedures
	  ○ Ability to process Customer Website Correspondence
	  ○ Ability to process different types of Transactions by IVR, process payments, process Violations and validate the IVR system		

Req ID	Plans and Testing (Section TP)	Required	Value Add
	• All SLAs of CSC operations meet all 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), and 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. The System Acceptance Test will also verify that: 1. HR policies and HR procedures of all staff on the TCS team are followed in accordance with the Joint Board approved Toll System Provider policy. 2. All transfers of files and interfaces to all outside systems have been tested, validated, and are functioning according to requirements; and that the system processes file transfer in near-real-time and verify transfer of data with outside interfaces 3. Financial transfers of funds are occurring in a timely manner 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. All interoperable accounts are handled and processed in a timely manner and 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		
TP-025	**Document Reviews** 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 third cycle but additional review cycles may be required if the Joint Board's comments are not addressed in the first three 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.	X	
	Proposer Response: The Toll System Provider will comply with requirement TP-025. Sanef will plan for two (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. We understand that the Joint Board does not intend to use more than two document reviews, but may require more if it feels that comments are not addressed to its satisfaction. We will provide all documents in PDF and native versions including MS Office, AutoCAD, Visio or other similar products.		
TP-026	**Maintenance of Traffic Plan** 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 require 12 hours written notice. 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.	X	
	Proposer Response: The Toll System Provider will comply with requirement TP-026. Accordingly, Sanef will assume responsibility for the planning and implementation and removal of lane closures for toll equipment preventative or emergency maintenance and for that purpose will utilize the most current state traffic control plans and standards applicable to the Toll Zone. All requests for lane closure will be addressed in writing in accordance with the applicable state policy: • For preventative maintenance lane closures at least 14 calendar days in advance • For emergency lane closures at least 12 hours in advance		
TP-027	**Incident Management Coordination** 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	X	

Req ID	Plans and Testing (Section TP)	Required	Value Add
	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.		
	Proposer Response: The Toll System Provider will comply with requirement TP-027. Sanef will establish, maintain and support a dedicated phone line and maintain the phone system used for coordination with the traffic management centers of INDOT and KYTC. This phone number will be a toll free number and will be established at least 9 months prior to Tolling Readiness Date. No system-to-system integration or interface will be implemented with the TMC. We will configure Phone, email and one-way really simple syndication (RSS) feeds for the TMC operations.		
TP-028	**CSC Operations Plan (separate from BOS)** 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 **no later than 180 days after NTP.** 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.	X	
	Proposer Response: The Toll System Provider will comply with requirement TP-028. No later than 180 days after NTP, Sanef will provide a Joint Board approved CSC Operations Plan This plan will include: • 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 • HR Policy and HR Benefits plan		
TP-029	**Walk-up Center Build out Plan** The Toll System Provider shall provide a Walk-up Center Plan **no later than 90 days after NTP.** 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.	X	
	Proposer Response: The Toll System Provider will comply with requirement TP-029. No later than 90 days after NTP, Sanef will provide a Walk-up Center Plan. This plan will identify: • the overall scope and construction and operational opening schedule for the Walk-up Centers • lease information, layout functions and deployment approach, and required marketing information needed from the Joint Board.		
TP-030	**Monthly Operations and Maintenance Report** Monthly O&M Performance Report that accurately describes the actual System performance as measured against the Performance Requirements section **shall be submitted in writing to the Joint Board each month no later than the 7th calendar day of the month.** 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&M Performance Report shall also include the inventory levels and performance of all equipment in the TCS. The first Monthly O &M Performance Report shall be delivered 30 days after commencement of the Pre-Toll Operations.	X	
	Proposer Response: The Toll System Provider will comply with requirement TP-030. No later than the 7th calendar day of the month, every month after the facilities open (i.e., sometime between the first and seventh day of every month, inclusive), Sanef will submit a Monthly O&M Performance Report. This report will • Describe the actual System performance as measured against the Performance Requirements section, and • Identify a corrective action plan for all deviations from the approved Performance Requirements agreements. The first Monthly O&M Performance Report will be delivered thirty (30) days after commencement of the Pre-Toll Operations. Thereafter, we will deliver an O&M report between the first and seventh of every month. An example of the Table of Contents of a Monthly O &M Performance Report is given below. This is the Table		

Req ID	Plans and Testing (Section TP)	Required	Value Add
	of contents from an O&M report issued for another of our current projects: 1. INTRODUCTION 1.1. Purpose 1.2. References 1.2.1. List of reference documents 1.2.2. List of applicable documents 1.3. Glossary of abbreviations, acronyms and terms 1.4. Methodology, tools, and techniques 2. TCS PERFOMANCE SUMMARY 3. SYSTEM CHANGES 3.1. Roadside System 3.2. Back Office System 4. TCS PERFORMANCE 4.1. TCS Performance Requirements Evaluation Protocols 4.1.1. Protocols 4.1.2. Calendar 4.2. Single Lane Toll System Unavailability 4.3. Unavailability of Toll System affecting more than one Lane 4.4. Seven days Roadside System operation without communications to Back Office 4.5. Correctly identifying an Tag/Transponder and its lane location 4.6. Detection Accuracy 4.7. Classification Accuracy 4.8. Accuracy of Vehicle Speed Measures 4.9. Success rate of capturing a human readable license plate image 4.10. Success rate in obtaining optical character recognition plate extraction 4.11. Image capture rate 4.12. Availability of each element of back office subsystem 4.13. On-line data storage for unresolved transactions 4.14. Time to update information 4.15. IVR Automatic responses 4.16. Interactive website 4.17. Secure customer access through website for account maintenance purposes 4.18. Success rate of the Roadside System records being correctly transmitted 5. TCS MAINTENANCE REQUIREMENT 5.1. Emergency maintenance 5.1.1. Requirements 5.1.2. Monthly Events 5.2. Corrective Maintenance 5.2.1. Requirements 5.2.2. Monthly Events 5.3. Preventive Maintenance 5.4. Spares Inventory		
TP-031	**Access to TSP Facilities** 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 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.	X	
	Proposer Response: The Toll System Provider will comply with requirement TP-031. Sanef will grant Joint Board's Designated Representatives access to its facilities and personnel at all times and will provide an office for 2 people at the CSC for the Joint Board's use at any time. This office will 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-032	**Disaster Recovery System Plan** 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 **no later than 180 days after NTP**. 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.	X	
	Proposer Response: The Toll System Provider will comply with requirement TP-032. No later than 180 days after NTP, the TSP will provide the Joint Board approved Disaster Recovery System Plan. This plan will: • Include a description of each system along with a description of how each system in the TCS will be recovered; • Describe all resources required to recover each system to operations; and • Describe any single failure points in the System and the Sanef plan to recover the System. An example of the Table of Contents of a Disaster Recovery System Plan is given in the Proposer Response of the requirement SA-040.		

ID	Task Name	Duration	Start	Finish
1	Execution of Contract	0 days	Thu 10/9/14	Thu 10/9/14
2	**Project Delivery Payment Milestones**	**679 days**	**Thu 10/9/14**	**Wed 6/28/17**
3	**Total Cumulative Summary Roadside, Network, Generator, & CMS**	**614 days**	**Thu 1/15/15**	**Wed 6/28/17**
29	**Total Back Office System & Disaster Recovery Cumulative Summary**	**158 days**	**Thu 1/8/15**	**Tue 8/25/15**
41	Total TOC Planning and TOC Pre-Toll Operations and System Monitoring Cumulative	**618 days**	**Thu 1/8/15**	**Tue 6/27/17**
52	Total Project Management and Planning Document Cumulative Summary	**678 days**	**Thu 10/9/14**	**Tue 6/27/17**
59	**Total Customer Service Center Pre-Tolls Operations**	**60 days**	**Thu 10/9/14**	**Thu 1/8/15**
62	Total End to End System Test Cumulative Summary	**588 days**	**Mon 2/23/15**	**Tue 6/27/17**
68	**Total Data Mart Cumulative Summary**	**0 days**	**Fri 1/30/15**	**Fri 1/30/15**
71	**Total Bonds and Insurance Cumulative Summary**	**0 days**	**Thu 11/6/14**	**Thu 11/6/14**
85	**Pre-Project NTP Submittals**	**23 days**	**Thu 10/9/14**	**Wed 11/12/14**
86	Finalize Key Personnel Assignments	23 days	Thu 10/9/14	Wed 11/12/14
87	Deliver Form of Guaranty	23 days	Thu 10/9/14	Wed 11/12/14
88	Complete Escrow Agreement	23 days	Thu 10/9/14	Wed 11/12/14
89	Provide Insurance and Bond Documents	20 days	Thu 10/9/14	Thu 11/6/14
90	Notice To Proceed	0 days	Wed 11/12/14	Wed 11/12/14
91	**Key Project Readiness Milestones**	**365 days**	**Fri 4/24/15**	**Fri 10/7/16**
92	Pre-Toll Operations Readiness Deadline	0 days	Thu 11/12/15	Thu 11/12/15
93	Mobilization Readiness Deadline	0 days	Fri 4/24/15	Fri 4/24/15
94	Conduct Pre-Toll Operations	240 edays	Wed 2/10/16	Fri 10/7/16
95	**Revenue Service Milestones**	**419 days**	**Thu 12/31/15**	**Thu 8/31/17**
96	Downtown Bridge Temporary Traffic Config Deadline	0 days	Thu 12/31/15	Thu 12/31/15
97	Downtown Bridges Final Traffic Config Deadline	0 days	Tue 8/30/16	Tue 8/30/16
98	East End Bridge Tolling Readiness Deadline	0 days	Wed 8/31/16	Wed 8/31/16
99	Startup Operations (12 months total)	365 edays	Wed 8/31/16	Thu 8/31/17
100	**Project Management**	**25 days**	**Thu 10/9/14**	**Fri 11/14/14**
101	**Mobilize**	**20 days**	**Thu 10/9/14**	**Thu 11/6/14**
104	**Complete and Submit Project Schedule**	**25 days**	**Thu 10/9/14**	**Fri 11/14/14**
108	**Project Planning Documentation**	**208 days**	**Thu 11/13/14**	**Mon 9/14/15**
109	**Complete Project Management Plan**	**45 days**	**Thu 11/13/14**	**Wed 1/21/15**
114	**Complete Project Safety Plan**	**45 days**	**Thu 11/13/14**	**Wed 1/21/15**
119	**Complete Sys Config & Mgt Plan**	**45 days**	**Thu 11/13/14**	**Wed 1/21/15**
124	**Complete Quality Mgt Plan**	**45 days**	**Thu 11/13/14**	**Wed 1/21/15**
129	**Complete Config & Change Mgt Plan**	**50 days**	**Thu 11/13/14**	**Wed 1/28/15**
134	**Complete Master Test & Commissioning Plan**	**45 days**	**Thu 11/13/14**	**Wed 1/21/15**
139	**Complete Walk-up Center Build Out Plan**	**45 days**	**Thu 11/13/14**	**Wed 1/21/15**
144	**Complete Roadside & Network Installation Plan**	**65 days**	**Thu 11/13/14**	**Thu 2/19/15**
149	**Complete BOS Installation Plan**	**95 days**	**Thu 11/13/14**	**Thu 4/2/15**
154	**Complete Training Plan**	**95 days**	**Thu 11/13/14**	**Thu 4/2/15**
159	**Complete Maint & Support Plan**	**95 days**	**Thu 11/13/14**	**Thu 4/2/15**
164	**Complete Transition Plan**	**95 days**	**Thu 11/13/14**	**Thu 4/2/15**
169	**Update 3rd Party Manuals & Documentation**	**95 days**	**Thu 11/13/14**	**Thu 4/2/15**
174	**Complete CSC Operations Plan**	**80 days**	**Thu 11/13/14**	**Thu 3/12/15**
179	**Prepare & Submit Monthly Progress Report**	**208 days**	**Thu 11/13/14**	**Mon 9/14/15**
192	**Prepare & Submit Project Management Report**	**208 days**	**Thu 11/13/14**	**Mon 9/14/15**
205	**Update & Submit Project Schedule**	**208 days**	**Thu 11/13/14**	**Mon 9/14/15**
218	**Conduct Monthly Progress Meeting**	**206 days**	**Thu 11/13/14**	**Thu 9/10/15**
231	**Complete System Design and Development**	**111 days**	**Thu 11/13/14**	**Fri 4/24/15**
232	**Complete Systems Plans & Design Documentation**	**55 days**	**Thu 11/13/14**	**Wed 2/4/15**
252	**Complete Baseline Test**	**111 days**	**Thu 11/13/14**	**Fri 4/24/15**
268	**Complete Pre-production Controlled Test**	**67 days**	**Thu 11/13/14**	**Mon 2/23/15**
278	**Procurement**	**65 days**	**Thu 10/9/14**	**Thu 1/15/15**
293	**Deploy CSC/BOS/TOC Facilities**	**249 days**	**Thu 11/13/14**	**Thu 11/12/15**
294	**Facilities Prep**	**100 days**	**Thu 11/13/14**	**Thu 4/9/15**
299	**Build-out CSC Facilities**	**149 days**	**Fri 4/10/15**	**Thu 11/12/15**
308	**Staffing**	**85 days**	**Mon 4/27/15**	**Wed 8/26/15**
312	**Install BOS**	**30 days**	**Fri 1/9/15**	**Mon 2/23/15**
320	**Train BOS/CSC/TOC Personnel**	**195 days**	**Thu 11/13/14**	**Tue 8/25/15**
325	**Complete Systems Production Readiness Test**	**75 days**	**Tue 2/24/15**	**Wed 6/10/15**
335	Tolling Infrastructure Turnover Downtown Bridge 1	0 days	Mon 11/9/15	Mon 11/9/15
336	**Complete Roadside & Network Installation Downtown Bridge 1 (Temporary)**	**35 days**	**Mon 11/9/15**	**Thu 12/31/15**
349	Tolling Infrastructure Turnover Downtown Bridge 2	0 days	Wed 6/1/16	Wed 6/1/16
350	**Complete Roadside & Network Installation Downtown Bridge 2**	**35 days**	**Wed 6/1/16**	**Wed 7/20/16**
360	Board Notification of 120 Days to DB Substantial Completion	0 days	Thu 6/16/16	Thu 6/16/16
361	**Reconfigure Temporary Traffic Configuration**	**44 days**	**Wed 6/29/16**	**Tue 8/30/16**
369	Tolling Infrastructure Turnover East End Bridge	0 days	Fri 5/13/16	Fri 5/13/16
370	**Complete Roadside & Network Installation East End Bridge**	**76 days**	**Mon 5/16/16**	**Wed 8/31/16**
383	**Post Installation Testing**	**513 days**	**Thu 6/11/15**	**Tue 6/27/17**
384	**Operations Test**	**429 days**	**Thu 6/11/15**	**Tue 2/28/17**
405	**Systems Acceptance Test**	**513 days**	**Thu 6/11/15**	**Tue 6/27/17**
416	**Project Final Submittals**	**47 days**	**Wed 6/28/17**	**Tue 9/5/17**
417	**Submit Project Documentation (As-Builts)**	**47 days**	**Wed 6/28/17**	**Tue 9/5/17**



Project: LSIORB TCS Draft_v3
Date: Sat 7/26/14

Task		Summary		External Milestone		Inactive Milestone		Duration-only		Start-only		Critical Split	
Split		Project Summary		Inactive Task		Inactive Summary		Manual Summary Rollup		Finish-only		Progress	
Milestone		External Tasks		Inactive Task		Manual Task		Manual Summary		Critical		Deadline	

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29	**Total Back Office System & Disaster Recovery Cumulative Summary**	**158 days**	**Thu 1/8/15**	**Tue 8/25/15**
41	Total TOC Planning and TOC Pre-Toll Operations and System Monitoring Cumulative	**618 days**	**Thu 1/8/15**	**Tue 6/27/17**
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59	**Total Customer Service Center Pre-Tolls Operations**	**60 days**	**Thu 10/9/14**	**Thu 1/8/15**
62	Total End to End System Test Cumulative Summary	**588 days**	**Mon 2/23/15**	**Tue 6/27/17**
68	**Total Data Mart Cumulative Summary**	**0 days**	**Fri 1/30/15**	**Fri 1/30/15**
71	**Total Bonds and Insurance Cumulative Summary**	**0 days**	**Thu 11/6/14**	**Thu 11/6/14**
85	**Pre-Project NTP Submittals**	**23 days**	**Thu 10/9/14**	**Wed 11/12/14**
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119	**Complete Sys Config & Mgt Plan**	**45 days**	**Thu 11/13/14**	**Wed 1/21/15**
124	**Complete Quality Mgt Plan**	**45 days**	**Thu 11/13/14**	**Wed 1/21/15**
129	**Complete Config & Change Mgt Plan**	**50 days**	**Thu 11/13/14**	**Wed 1/28/15**
134	**Complete Master Test & Commissioning Plan**	**45 days**	**Thu 11/13/14**	**Wed 1/21/15**
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144	**Complete Roadside & Network Installation Plan**	**65 days**	**Thu 11/13/14**	**Thu 2/19/15**
149	**Complete BOS Installation Plan**	**95 days**	**Thu 11/13/14**	**Thu 4/2/15**
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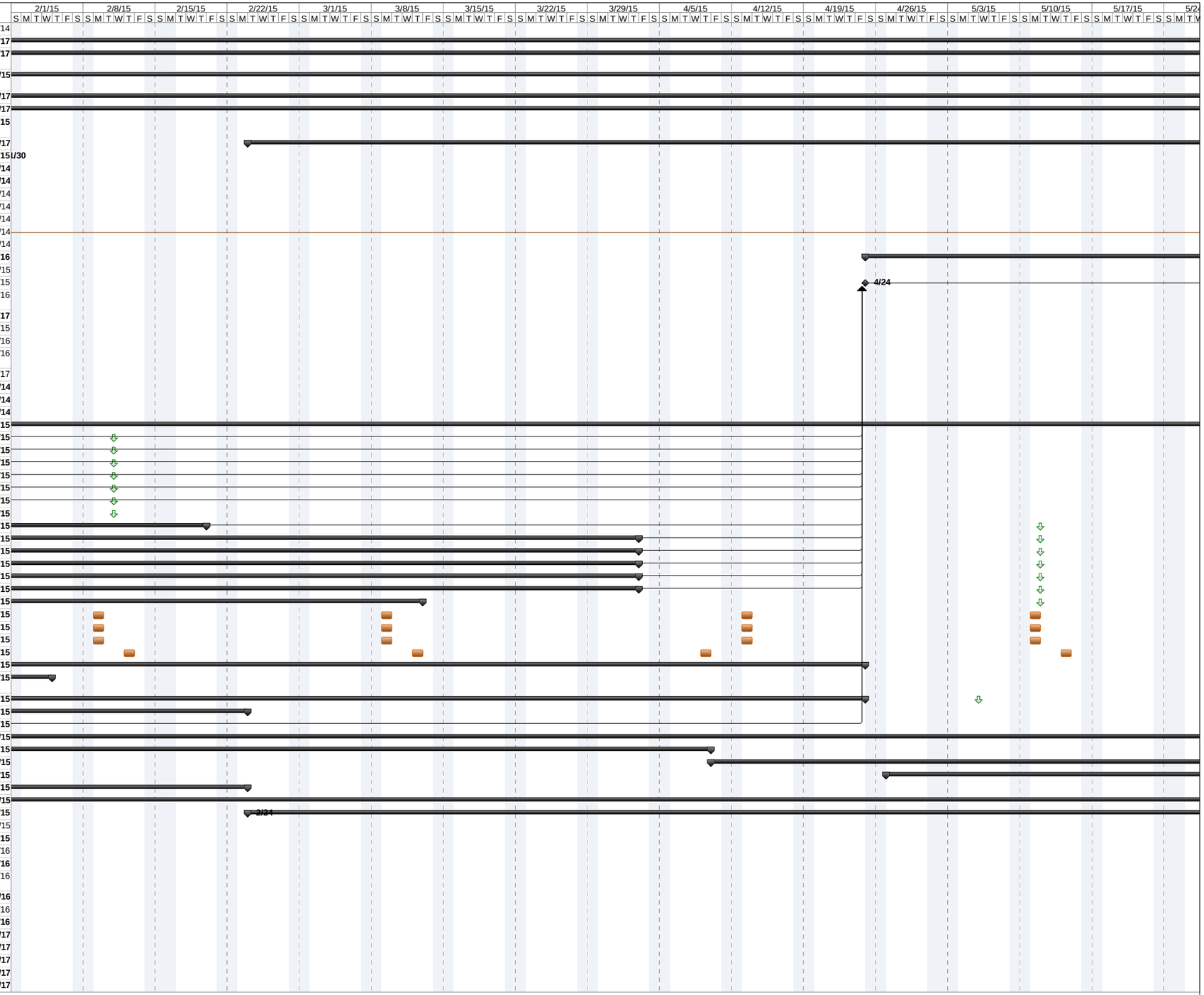

Project: LSIORB TCS Draft_v3
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Task		Summary		External Milestone		Inactive Milestone		Duration-only		Start-only		Critical Split	
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Milestone		External Tasks		Inactive Task		Manual Task		Manual Summary		Critical		Deadline	

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268	**Complete Pre-production Controlled Test**	**67 days**	**Thu 11/13/14**	**Mon 2/23/15**
278	**Procurement**	**65 days**	**Thu 10/9/14**	**Thu 1/15/15**
293	**Deploy CSC/BOS/TOC Facilities**	**249 days**	**Thu 11/13/14**	**Thu 11/12/15**
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299	**Build-out CSC Facilities**	**149 days**	**Fri 4/10/15**	**Thu 11/12/15**
308	**Staffing**	**85 days**	**Mon 4/27/15**	**Wed 8/26/15**
312	**Install BOS**	**30 days**	**Fri 1/9/15**	**Mon 2/23/15**
320	**Train BOS/CSC/TOC Personnel**	**195 days**	**Thu 11/13/14**	**Tue 8/25/15**
325	**Complete Systems Production Readiness Test**	**75 days**	**Tue 2/24/15**	**Wed 6/10/15**
335	Tolling Infrastructure Turnover Downtown Bridge 1	0 days	Mon 11/9/15	Mon 11/9/15
336	**Complete Roadside & Network Installation Downtown Bridge 1 (Temporary)**	**35 days**	**Mon 11/9/15**	**Thu 12/31/15**
349	Tolling Infrastructure Turnover Downtown Bridge 2	0 days	Wed 6/1/16	Wed 6/1/16
350	**Complete Roadside & Network Installation Downtown Bridge 2**	**35 days**	**Wed 6/1/16**	**Wed 7/20/16**
360	Board Notification of 120 Days to DB Substantial Completion	0 days	Thu 6/16/16	Thu 6/16/16
361	**Reconfigure Temporary Traffic Configuration**	**44 days**	**Wed 6/29/16**	**Tue 8/30/16**
369	Tolling Infrastructure Turnover East End Bridge	0 days	Fri 5/13/16	Fri 5/13/16
370	**Complete Roadside & Network Installation East End Bridge**	**76 days**	**Mon 5/16/16**	**Wed 8/31/16**
383	**Post Installation Testing**	**513 days**	**Thu 6/11/15**	**Tue 6/27/17**
384	**Operations Test**	**429 days**	**Thu 6/11/15**	**Tue 2/28/17**
405	**Systems Acceptance Test**	**513 days**	**Thu 6/11/15**	**Tue 6/27/17**
416	**Project Final Submittals**	**47 days**	**Wed 6/28/17**	**Tue 9/5/17**
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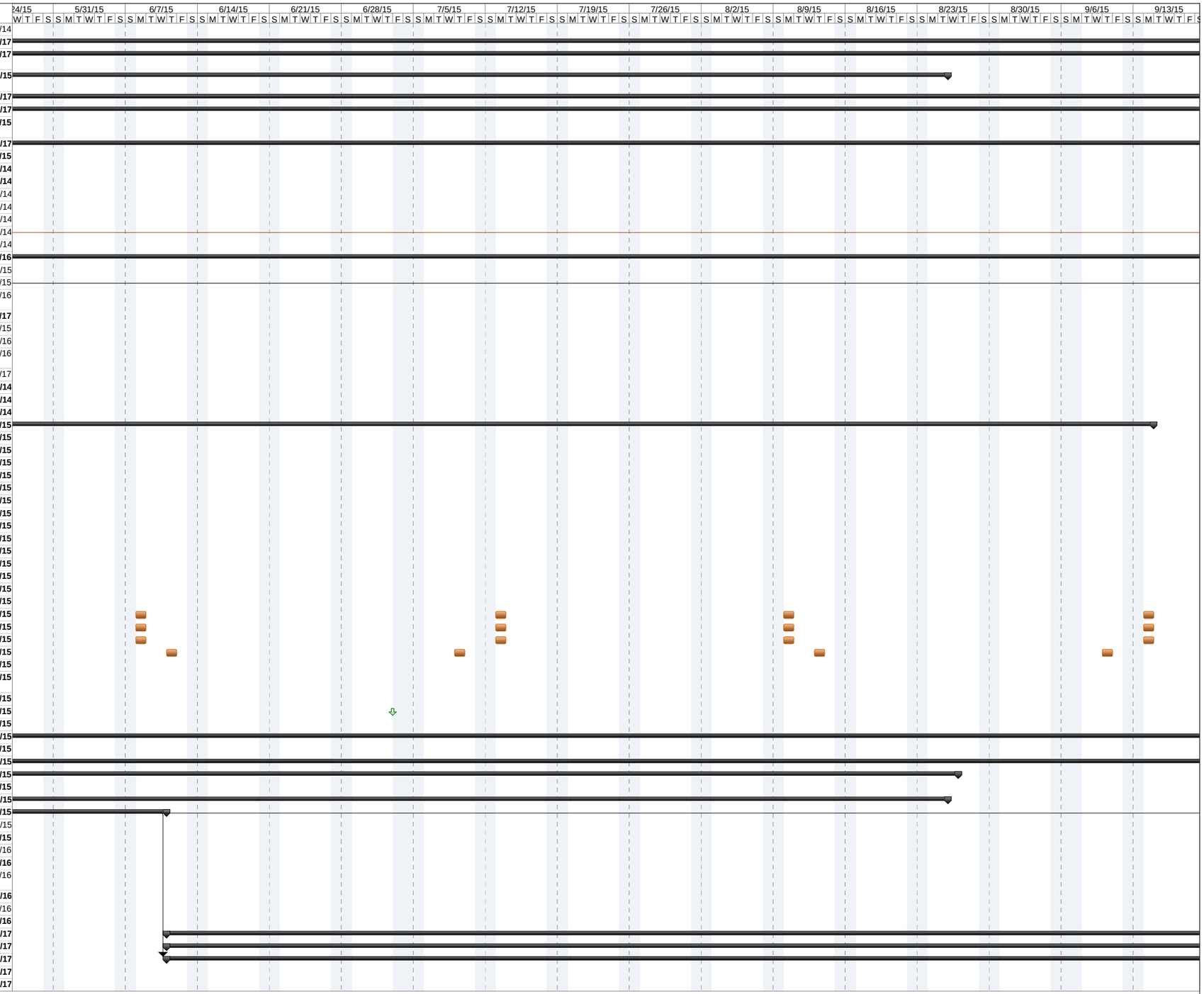

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3	**Total Cumulative Summary Roadside, Network, Generator, & CMS**	**614 days**	**Thu 1/15/15**	**Wed 6/28/17**
29	**Total Back Office System & Disaster Recovery Cumulative Summary**	**158 days**	**Thu 1/8/15**	**Tue 8/25/15**
41	Total TOC Planning and TOC Pre-Toll Operations and System Monitoring Cumulative	**618 days**	**Thu 1/8/15**	**Tue 6/27/17**
52	Total Project Management and Planning Document Cumulative Summary	**678 days**	**Thu 10/9/14**	**Tue 6/27/17**
59	**Total Customer Service Center Pre-Tolls Operations**	**60 days**	**Thu 10/9/14**	**Thu 1/8/15**
62	Total End to End System Test Cumulative Summary	**588 days**	**Mon 2/23/15**	**Tue 6/27/17**
68	**Total Data Mart Cumulative Summary**	**0 days**	**Fri 1/30/15**	**Fri 1/30/15**
71	**Total Bonds and Insurance Cumulative Summary**	**0 days**	**Thu 11/6/14**	**Thu 11/6/14**
85	**Pre-Project NTP Submittals**	**23 days**	**Thu 10/9/14**	**Wed 11/12/14**
86	Finalize Key Personnel Assignments	23 days	Thu 10/9/14	Wed 11/12/14
87	Deliver Form of Guaranty	23 days	Thu 10/9/14	Wed 11/12/14
88	Complete Escrow Agreement	23 days	Thu 10/9/14	Wed 11/12/14
89	Provide Insurance and Bond Documents	20 days	Thu 10/9/14	Thu 11/6/14
90	Notice To Proceed	0 days	Wed 11/12/14	Wed 11/12/14
91	**Key Project Readiness Milestones**	**365 days**	**Fri 4/24/15**	**Fri 10/7/16**
92	Pre-Toll Operations Readiness Deadline	0 days	Thu 11/12/15	Thu 11/12/15
93	Mobilization Readiness Deadline	0 days	Fri 4/24/15	Fri 4/24/15
94	Conduct Pre-Toll Operations	240 edays	Wed 2/10/16	Fri 10/7/16
95	**Revenue Service Milestones**	**419 days**	**Thu 12/31/15**	**Thu 8/31/17**
96	Downtown Bridge Temporary Traffic Config Deadline	0 days	Thu 12/31/15	Thu 12/31/15
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99	Startup Operations (12 months total)	365 edays	Wed 8/31/16	Thu 8/31/17
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104	**Complete and Submit Project Schedule**	**25 days**	**Thu 10/9/14**	**Fri 11/14/14**
108	**Project Planning Documentation**	**208 days**	**Thu 11/13/14**	**Mon 9/14/15**
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119	**Complete Sys Config & Mgt Plan**	**45 days**	**Thu 11/13/14**	**Wed 1/21/15**
124	**Complete Quality Mgt Plan**	**45 days**	**Thu 11/13/14**	**Wed 1/21/15**
129	**Complete Config & Change Mgt Plan**	**50 days**	**Thu 11/13/14**	**Wed 1/28/15**
134	**Complete Master Test & Commissioning Plan**	**45 days**	**Thu 11/13/14**	**Wed 1/21/15**
139	**Complete Walk-up Center Build Out Plan**	**45 days**	**Thu 11/13/14**	**Wed 1/21/15**
144	**Complete Roadside & Network Installation Plan**	**65 days**	**Thu 11/13/14**	**Thu 2/19/15**
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154	**Complete Training Plan**	**95 days**	**Thu 11/13/14**	**Thu 4/2/15**
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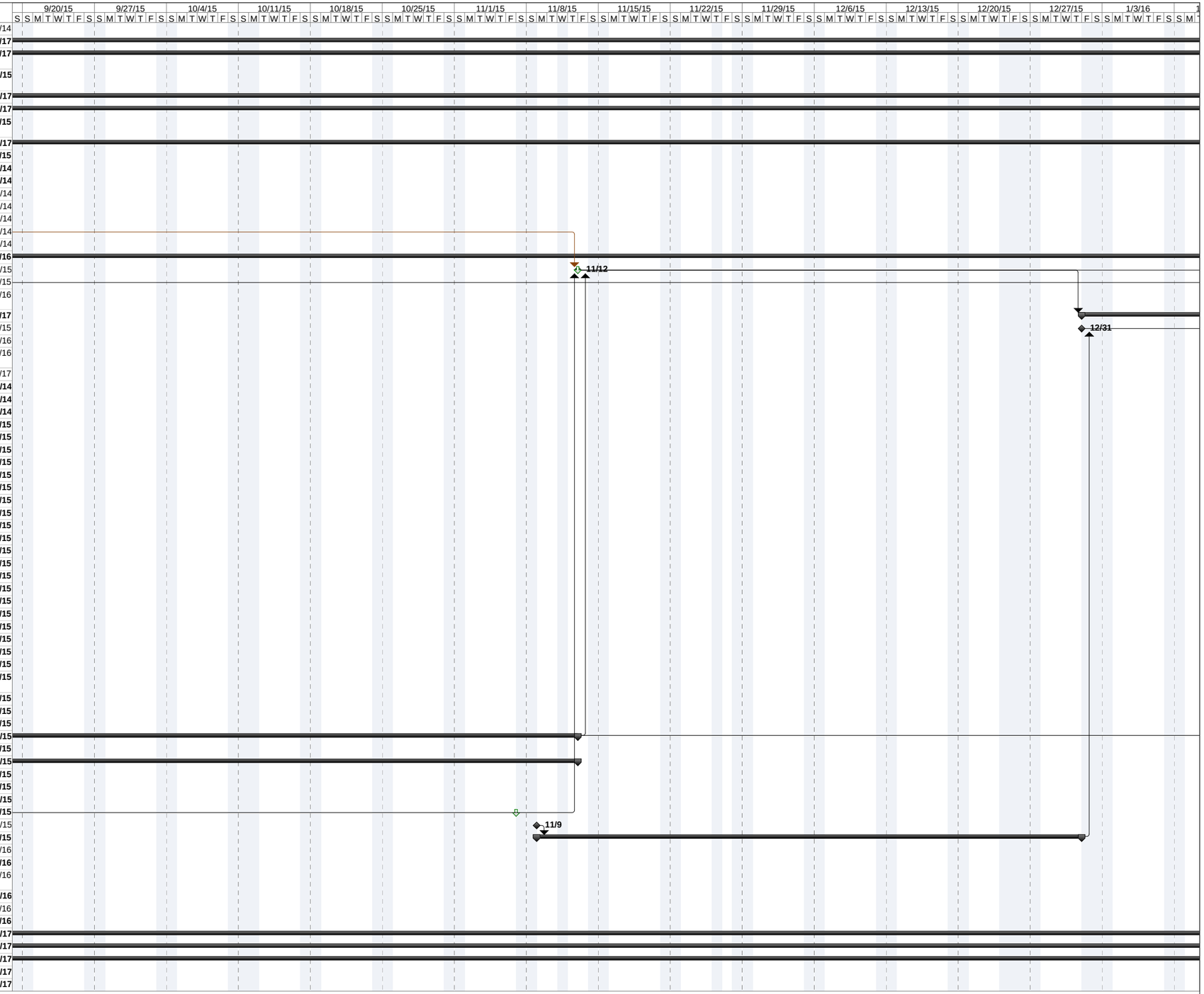

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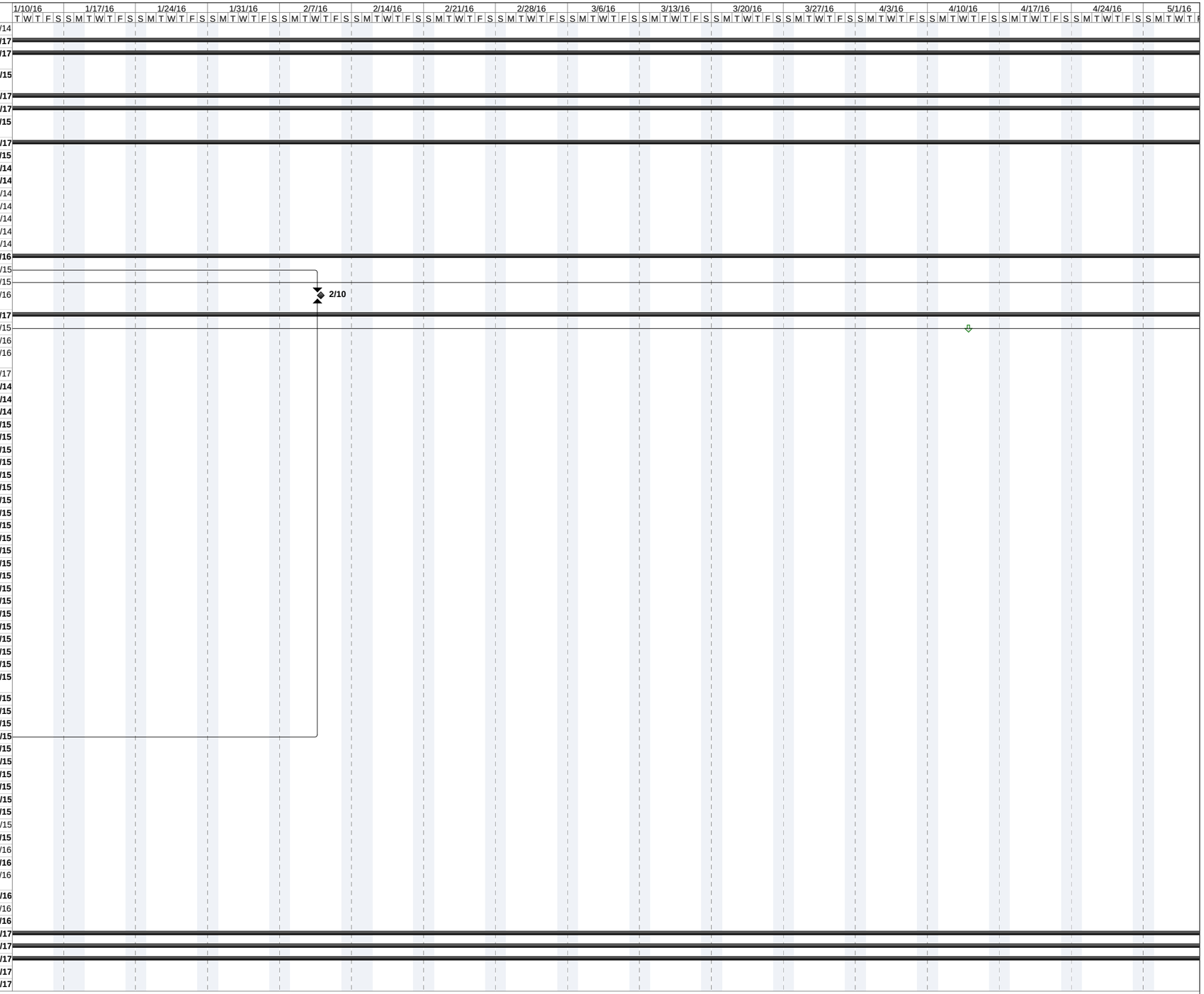

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268	**Complete Pre-production Controlled Test**	**67 days**	**Thu 11/13/14**	**Mon 2/23/15**
278	**Procurement**	**65 days**	**Thu 10/9/14**	**Thu 1/15/15**
293	**Deploy CSC/BOS/TOC Facilities**	**249 days**	**Thu 11/13/14**	**Thu 11/12/15**
294	**Facilities Prep**	**100 days**	**Thu 11/13/14**	**Thu 4/9/15**
299	**Build-out CSC Facilities**	**149 days**	**Fri 4/10/15**	**Thu 11/12/15**
308	**Staffing**	**85 days**	**Mon 4/27/15**	**Wed 8/26/15**
312	**Install BOS**	**30 days**	**Fri 1/9/15**	**Mon 2/23/15**
320	**Train BOS/CSC/TOC Personnel**	**195 days**	**Thu 11/13/14**	**Tue 8/25/15**
325	**Complete Systems Production Readiness Test**	**75 days**	**Tue 2/24/15**	**Wed 6/10/15**
335	Tolling Infrastructure Turnover Downtown Bridge 1	0 days	Mon 11/9/15	Mon 11/9/15
336	**Complete Roadside & Network Installation Downtown Bridge 1 (Temporary)**	**35 days**	**Mon 11/9/15**	**Thu 12/31/15**
349	Tolling Infrastructure Turnover Downtown Bridge 2	0 days	Wed 6/1/16	Wed 6/1/16
350	**Complete Roadside & Network Installation Downtown Bridge 2**	**35 days**	**Wed 6/1/16**	**Wed 7/20/16**
360	Board Notification of 120 Days to DB Substantial Completion	0 days	Thu 6/16/16	Thu 6/16/16
361	**Reconfigure Temporary Traffic Configuration**	**44 days**	**Wed 6/29/16**	**Tue 8/30/16**
369	Tolling Infrastructure Turnover East End Bridge	0 days	Fri 5/13/16	Fri 5/13/16
370	**Complete Roadside & Network Installation East End Bridge**	**76 days**	**Mon 5/16/16**	**Wed 8/31/16**
383	**Post Installation Testing**	**513 days**	**Thu 6/11/15**	**Tue 6/27/17**
384	**Operations Test**	**429 days**	**Thu 6/11/15**	**Tue 2/28/17**
405	**Systems Acceptance Test**	**513 days**	**Thu 6/11/15**	**Tue 6/27/17**
416	**Project Final Submittals**	**47 days**	**Wed 6/28/17**	**Tue 9/5/17**
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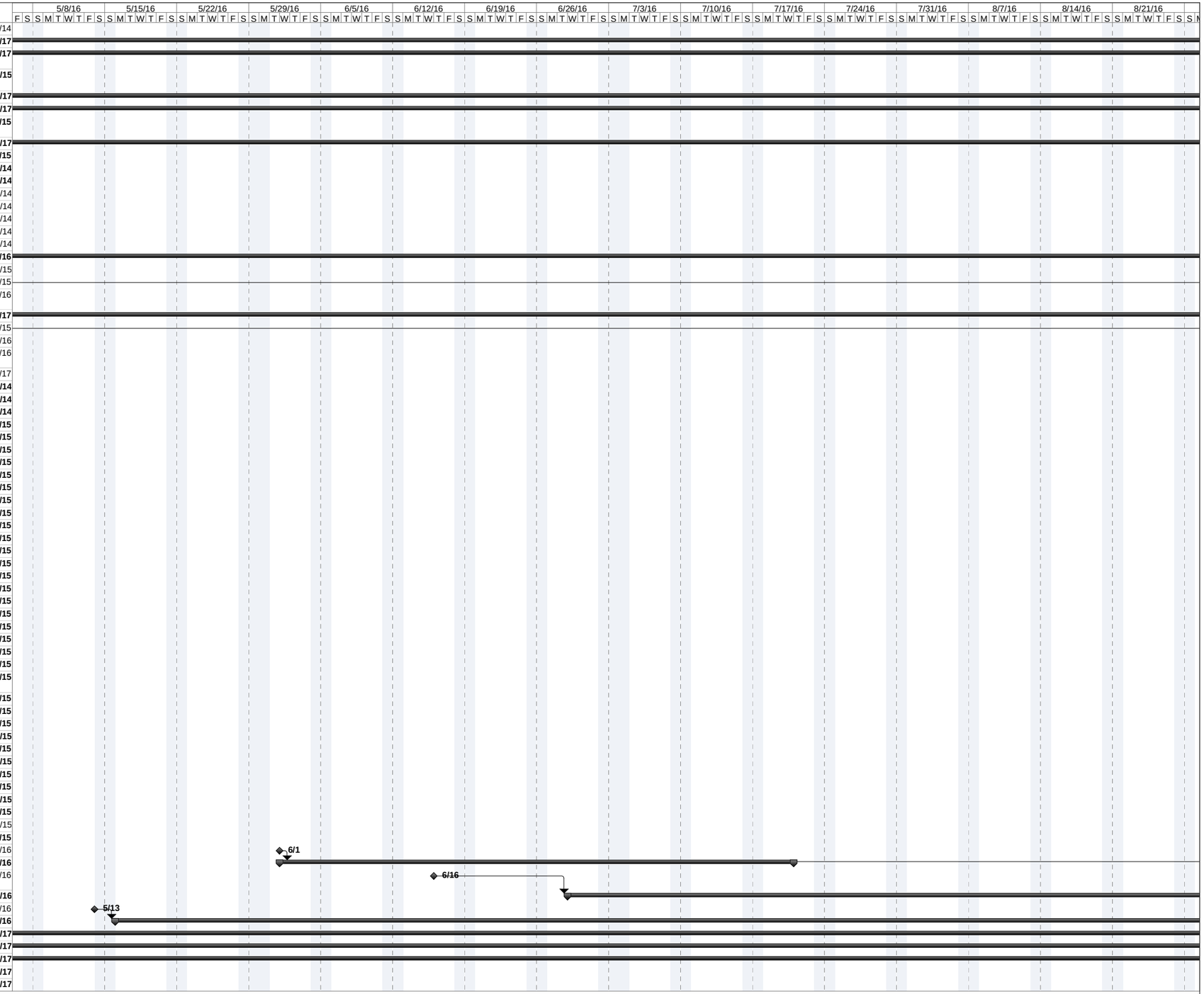

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3	**Total Cumulative Summary Roadside, Network, Generator, & CMS**	**614 days**	**Thu 1/15/15**	**Wed 6/28/17**
29	**Total Back Office System & Disaster Recovery Cumulative Summary**	**158 days**	**Thu 1/8/15**	**Tue 8/25/15**
41	Total TOC Planning and TOC Pre-Toll Operations and System Monitoring Cumulative	**618 days**	**Thu 1/8/15**	**Tue 6/27/17**
52	Total Project Management and Planning Document Cumulative Summary	**678 days**	**Thu 10/9/14**	**Tue 6/27/17**
59	**Total Customer Service Center Pre-Tolls Operations**	**60 days**	**Thu 10/9/14**	**Thu 1/8/15**
62	Total End to End System Test Cumulative Summary	**588 days**	**Mon 2/23/15**	**Tue 6/27/17**
68	**Total Data Mart Cumulative Summary**	**0 days**	**Fri 1/30/15**	**Fri 1/30/15**
71	**Total Bonds and Insurance Cumulative Summary**	**0 days**	**Thu 11/6/14**	**Thu 11/6/14**
85	**Pre-Project NTP Submittals**	**23 days**	**Thu 10/9/14**	**Wed 11/12/14**
86	Finalize Key Personnel Assignments	23 days	Thu 10/9/14	Wed 11/12/14
87	Deliver Form of Guaranty	23 days	Thu 10/9/14	Wed 11/12/14
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89	Provide Insurance and Bond Documents	20 days	Thu 10/9/14	Thu 11/6/14
90	Notice To Proceed	0 days	Wed 11/12/14	Wed 11/12/14
91	**Key Project Readiness Milestones**	**365 days**	**Fri 4/24/15**	**Fri 10/7/16**
92	Pre-Toll Operations Readiness Deadline	0 days	Thu 11/12/15	Thu 11/12/15
93	Mobilization Readiness Deadline	0 days	Fri 4/24/15	Fri 4/24/15
94	Conduct Pre-Toll Operations	240 edays	Wed 2/10/16	Fri 10/7/16
95	**Revenue Service Milestones**	**419 days**	**Thu 12/31/15**	**Thu 8/31/17**
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98	East End Bridge Tolling Readiness Deadline	0 days	Wed 8/31/16	Wed 8/31/16
99	Startup Operations (12 months total)	365 edays	Wed 8/31/16	Thu 8/31/17
100	**Project Management**	**25 days**	**Thu 10/9/14**	**Fri 11/14/14**
101	**Mobilize**	**20 days**	**Thu 10/9/14**	**Thu 11/6/14**
104	**Complete and Submit Project Schedule**	**25 days**	**Thu 10/9/14**	**Fri 11/14/14**
108	**Project Planning Documentation**	**208 days**	**Thu 11/13/14**	**Mon 9/14/15**
109	**Complete Project Management Plan**	**45 days**	**Thu 11/13/14**	**Wed 1/21/15**
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119	**Complete Sys Config & Mgt Plan**	**45 days**	**Thu 11/13/14**	**Wed 1/21/15**
124	**Complete Quality Mgt Plan**	**45 days**	**Thu 11/13/14**	**Wed 1/21/15**
129	**Complete Config & Change Mgt Plan**	**50 days**	**Thu 11/13/14**	**Wed 1/28/15**
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154	**Complete Training Plan**	**95 days**	**Thu 11/13/14**	**Thu 4/2/15**
159	**Complete Maint & Support Plan**	**95 days**	**Thu 11/13/14**	**Thu 4/2/15**
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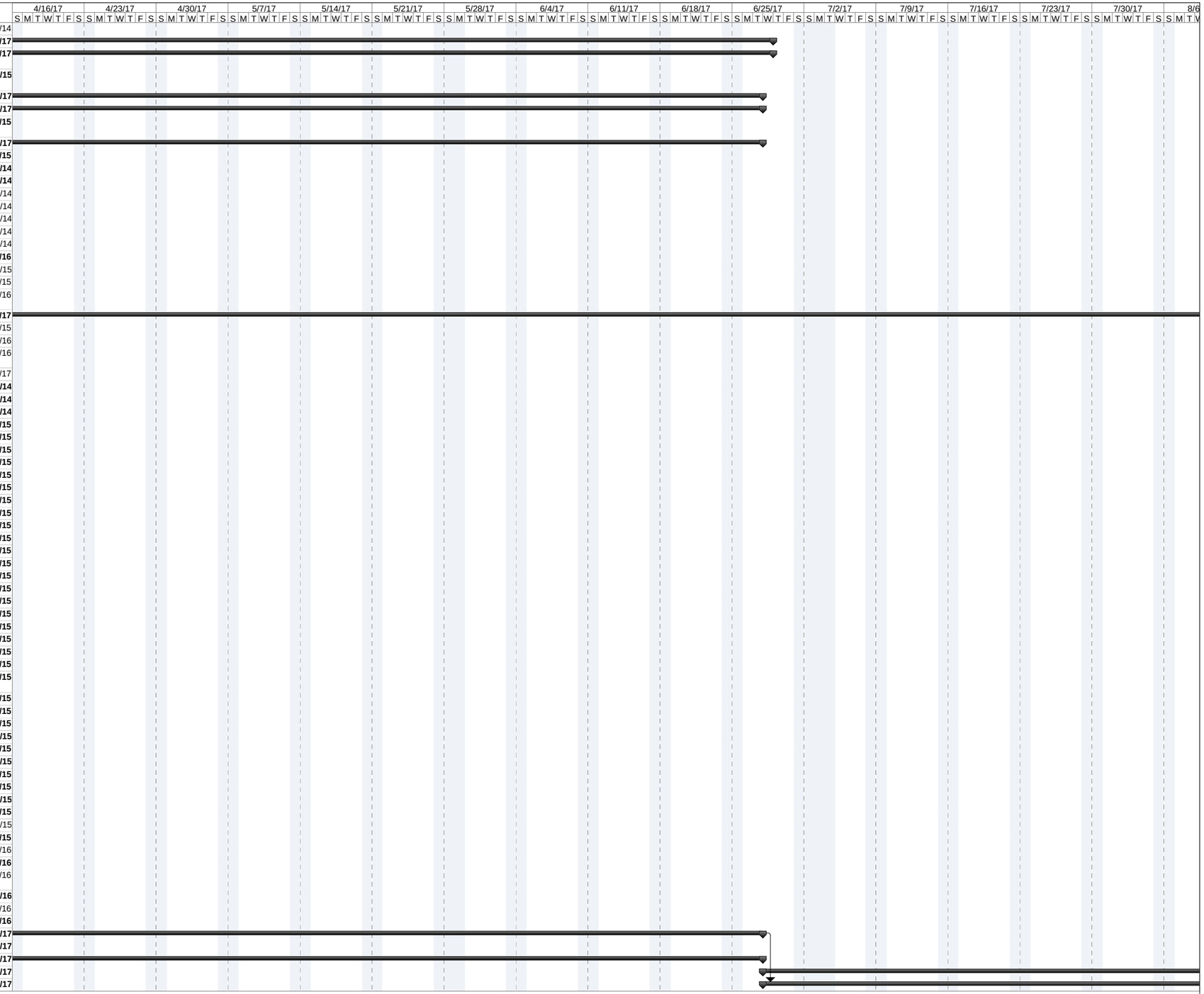
320	**Train BOS/CSC/TOC Personnel**	**195 days**	**Thu 11/13/14**	**Tue 8/25/15**
325	**Complete Systems Production Readiness Test**	**75 days**	**Tue 2/24/15**	**Wed 6/10/15**
335	Tolling Infrastructure Turnover Downtown Bridge 1	0 days	Mon 11/9/15	Mon 11/9/15
336	**Complete Roadside & Network Installation Downtown Bridge 1 (Temporary)**	**35 days**	**Mon 11/9/15**	**Thu 12/31/15**
349	Tolling Infrastructure Turnover Downtown Bridge 2	0 days	Wed 6/1/16	Wed 6/1/16
350	**Complete Roadside & Network Installation Downtown Bridge 2**	**35 days**	**Wed 6/1/16**	**Wed 7/20/16**
360	Board Notification of 120 Days to DB Substantial Completion	0 days	Thu 6/16/16	Thu 6/16/16
361	**Reconfigure Temporary Traffic Configuration**	**44 days**	**Wed 6/29/16**	**Tue 8/30/16**
369	Tolling Infrastructure Turnover East End Bridge	0 days	Fri 5/13/16	Fri 5/13/16
370	**Complete Roadside & Network Installation East End Bridge**	**76 days**	**Mon 5/16/16**	**Wed 8/31/16**
383	**Post Installation Testing**	**513 days**	**Thu 6/11/15**	**Tue 6/27/17**
384	**Operations Test**	**429 days**	**Thu 6/11/15**	**Tue 2/28/17**
405	**Systems Acceptance Test**	**513 days**	**Thu 6/11/15**	**Tue 6/27/17**
416	**Project Final Submittals**	**47 days**	**Wed 6/28/17**	**Tue 9/5/17**
417	**Submit Project Documentation (As-Builts)**	**47 days**	**Wed 6/28/17**	**Tue 9/5/17**



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Task | Split | Milestone | Summary | Project Summary | External Tasks | External Milestone | Inactive Task | Inactive Task | Inactive Milestone | Inactive Summary | Manual Task | Duration-only | Manual Summary Rollup | Manual Summary | Start-only | Finish-only | Critical | Critical Split | Progress | Deadline

ID	Task Name	Duration	Start	Finish
1	Execution of Contract	0 days	Thu 10/9/14	Thu 10/9/14
2	**Project Delivery Payment Milestones**	**679 days**	**Thu 10/9/14**	**Wed 6/28/17**
3	**Total Cumulative Summary Roadside, Network, Generator, & CMS**	**614 days**	**Thu 1/15/15**	**Wed 6/28/17**
29	**Total Back Office System & Disaster Recovery Cumulative Summary**	**158 days**	**Thu 1/8/15**	**Tue 8/25/15**
41	Total TOC Planning and TOC Pre-Toll Operations and System Monitoring Cumulative	**618 days**	**Thu 1/8/15**	**Tue 6/27/17**
52	Total Project Management and Planning Document Cumulative Summary	**678 days**	**Thu 10/9/14**	**Tue 6/27/17**
59	**Total Customer Service Center Pre-Tolls Operations**	**60 days**	**Thu 10/9/14**	**Thu 1/8/15**
62	Total End to End System Test Cumulative Summary	**588 days**	**Mon 2/23/15**	**Tue 6/27/17**
68	**Total Data Mart Cumulative Summary**	**0 days**	**Fri 1/30/15**	**Fri 1/30/15**
71	**Total Bonds and Insurance Cumulative Summary**	**0 days**	**Thu 11/6/14**	**Thu 11/6/14**
85	**Pre-Project NTP Submittals**	**23 days**	**Thu 10/9/14**	**Wed 11/12/14**
86	Finalize Key Personnel Assignments	23 days	Thu 10/9/14	Wed 11/12/14
87	Deliver Form of Guaranty	23 days	Thu 10/9/14	Wed 11/12/14
88	Complete Escrow Agreement	23 days	Thu 10/9/14	Wed 11/12/14
89	Provide Insurance and Bond Documents	20 days	Thu 10/9/14	Thu 11/6/14
90	Notice To Proceed	0 days	Wed 11/12/14	Wed 11/12/14
91	**Key Project Readiness Milestones**	**365 days**	**Fri 4/24/15**	**Fri 10/7/16**
92	Pre-Toll Operations Readiness Deadline	0 days	Thu 11/12/15	Thu 11/12/15
93	Mobilization Readiness Deadline	0 days	Fri 4/24/15	Fri 4/24/15
94	Conduct Pre-Toll Operations	240 edays	Wed 2/10/16	Fri 10/7/16
95	**Revenue Service Milestones**	**419 days**	**Thu 12/31/15**	**Thu 8/31/17**
96	Downtown Bridge Temporary Traffic Config Deadline	0 days	Thu 12/31/15	Thu 12/31/15
97	Downtown Bridges Final Traffic Config Deadline	0 days	Tue 8/30/16	Tue 8/30/16
98	East End Bridge Tolling Readiness Deadline	0 days	Wed 8/31/16	Wed 8/31/16
99	Startup Operations (12 months total)	365 edays	Wed 8/31/16	Thu 8/31/17
100	**Project Management**	**25 days**	**Thu 10/9/14**	**Fri 11/14/14**
101	**Mobilize**	**20 days**	**Thu 10/9/14**	**Thu 11/6/14**
104	**Complete and Submit Project Schedule**	**25 days**	**Thu 10/9/14**	**Fri 11/14/14**
108	**Project Planning Documentation**	**208 days**	**Thu 11/13/14**	**Mon 9/14/15**
109	**Complete Project Management Plan**	**45 days**	**Thu 11/13/14**	**Wed 1/21/15**
114	**Complete Project Safety Plan**	**45 days**	**Thu 11/13/14**	**Wed 1/21/15**
119	**Complete Sys Config & Mgt Plan**	**45 days**	**Thu 11/13/14**	**Wed 1/21/15**
124	**Complete Quality Mgt Plan**	**45 days**	**Thu 11/13/14**	**Wed 1/21/15**
129	**Complete Config & Change Mgt Plan**	**50 days**	**Thu 11/13/14**	**Wed 1/28/15**
134	**Complete Master Test & Commissioning Plan**	**45 days**	**Thu 11/13/14**	**Wed 1/21/15**
139	**Complete Walk-up Center Build Out Plan**	**45 days**	**Thu 11/13/14**	**Wed 1/21/15**
144	**Complete Roadside & Network Installation Plan**	**65 days**	**Thu 11/13/14**	**Thu 2/19/15**
149	**Complete BOS Installation Plan**	**95 days**	**Thu 11/13/14**	**Thu 4/2/15**
154	**Complete Training Plan**	**95 days**	**Thu 11/13/14**	**Thu 4/2/15**
159	**Complete Maint & Support Plan**	**95 days**	**Thu 11/13/14**	**Thu 4/2/15**
164	**Complete Transition Plan**	**95 days**	**Thu 11/13/14**	**Thu 4/2/15**
169	**Update 3rd Party Manuals & Documentation**	**95 days**	**Thu 11/13/14**	**Thu 4/2/15**
174	**Complete CSC Operations Plan**	**80 days**	**Thu 11/13/14**	**Thu 3/12/15**
179	**Prepare & Submit Monthly Progress Report**	**208 days**	**Thu 11/13/14**	**Mon 9/14/15**
192	**Prepare & Submit Project Management Report**	**208 days**	**Thu 11/13/14**	**Mon 9/14/15**
205	**Update & Submit Project Schedule**	**208 days**	**Thu 11/13/14**	**Mon 9/14/15**
218	**Conduct Monthly Progress Meeting**	**206 days**	**Thu 11/13/14**	**Thu 9/10/15**
231	**Complete System Design and Development**	**111 days**	**Thu 11/13/14**	**Fri 4/24/15**
232	**Complete Systems Plans & Design Documentation**	**55 days**	**Thu 11/13/14**	**Wed 2/4/15**
252	**Complete Baseline Test**	**111 days**	**Thu 11/13/14**	**Fri 4/24/15**
268	**Complete Pre-production Controlled Test**	**67 days**	**Thu 11/13/14**	**Mon 2/23/15**
278	**Procurement**	**65 days**	**Thu 10/9/14**	**Thu 1/15/15**
293	**Deploy CSC/BOS/TOC Facilities**	**249 days**	**Thu 11/13/14**	**Thu 11/12/15**
294	**Facilities Prep**	**100 days**	**Thu 11/13/14**	**Thu 4/9/15**
299	**Build-out CSC Facilities**	**149 days**	**Fri 4/10/15**	**Thu 11/12/15**
308	**Staffing**	**85 days**	**Mon 4/27/15**	**Wed 8/26/15**
312	**Install BOS**	**30 days**	**Fri 1/9/15**	**Mon 2/23/15**
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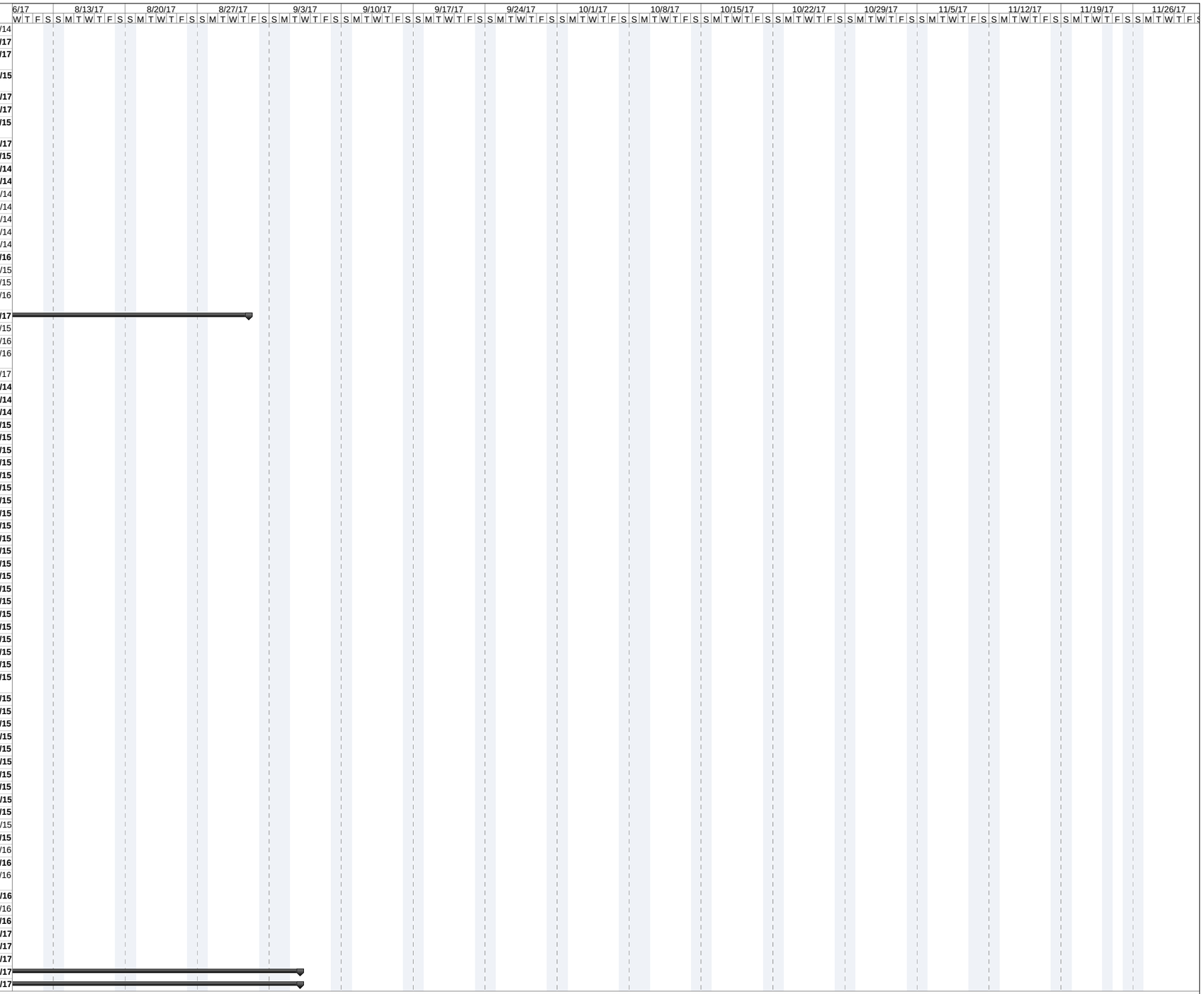

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Task		Summary		External Milestone		Inactive Milestone		Duration-only		Start-only		Critical Split	
Split		Project Summary		Inactive Task		Inactive Summary		Manual Summary Rollup		Finish-only		Progress	
Milestone		External Tasks		Inactive Task		Manual Task		Manual Summary		Critical		Deadline	