RFP APPENDIX 1: Attachment A-4

BAIFA
BAY AREA INFRASTRUCTURE FINANCING AUTHORITY

BAIFA Express Lane Network

Toll Collection System

DRAFT Business Rules

SUBJECT TO REVIEW AND REVISION BY BAIFA, OTHER GOVERNMENT AGENCIES, AND LEGAL COUNSEL

September 2013

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Introduction & Purpose

This document contains the business rules by which the Bay Area Infrastructure Financing Authority (BAIFA) operates its Express Lane Program (ELP). The purpose of this document is to track and maintain BAIFA's Business Rules as a living document. When a business rule is changed, the document will be updated and a notation made in the respective business rule under the "Last Changed" column. Any general or additional notes will appear in the revision history.

Several acronyms and terms are used throughout this document. Please refer to the *BAIFA Express Lane Network Glossary of Acronyms, Terms & Definitions* for further information.

Applicable Laws & Legislation

BAIFA, through agreement with MTC, has responsibility to develop, operate, and finance the ELP that was authorized by the California Transportation Commission (CTC). Many of the laws and regulations that apply to tolling of express lanes are identical to those that apply to other tolled facilities including the state-owned toll bridges (see California Code - Division 17: TOLL BRIDGES, TOLL FERRIES, AND TOLL ROADS [30000. - 31482.] Chapter 3: Toll Bridges, Toll Roads, and Toll Ferries Generally [30800. - 30902.] Article 2: Regulations [30840. - 30847.]). This section identifies two laws that affect the Express Lane Network (ELN) Business Rules in a broad fashion. Other applicable laws and regulations are noted with the associated specific ELN Business Rules.

Federal law specifies that the average operating speed on high-occupancy vehicle (HOV) lanes should be, at a minimum, 45 miles per hour (mph) 90 percent of the time over a consecutive 180-day period. The maximum traffic volume at which this speed can be reliably maintained on Bay Area HOV lanes is commonly assumed to be 1,600 vehicles per hour (vph), referred to herein as the operating capacity of the HOV lanes. (For exact wording, see Title 23, Section 166 of the U.S. Code.)

The express lane toll system must be compliant with Title 21 of the California Code of Regulations which establishes the technical requirements for Electronic Toll Collection (ETC) readers and transponders used in the State of California. This includes transponder/reader level compatibility with other California Toll Operators Committee (CTOC) agencies. It should be noted that discussions are under way to consider adding new tolling technologies to Title 21 (e.g., sticker tags).

Per California Streets and Highways Code, the express lanes must operate at Level of Service C or better, unless otherwise agreed upon by the California Department of Transportation (Caltrans) and BAIFA that Level of Service D is permissible. (For exact wording, see Section 149.5 and 149.7 of the California Streets and Highways Code.)

Roles & Responsibilities

Entity	Role	Responsibilities
Metropolitan Transportation Commission (MTC)	Lead Agency - Supplies Staff and Resources to BAIFA	Delegate authority and responsibilities to develop, procure, install, maintain, finance, and operate the ELN to BAIFA, through a cooperative agreement.
Bay Area Infrastructure Financing Authority (BAIFA)	ELN Operator and Overall Program Management and Project Delivery	Joint powers authority formed for the purpose of planning, developing, maintaining, and funding transportation and related projects, including express lanes. • Act as Express Lane Network Program Operator • Administer TSI agreement(s) • Monitor and report on express lane performance • Manage communications, marketing, and public outreach functions of the BAIFA-operated express lanes • Provide the reconciliation, accounting, and auditing functions for the ELN • Maintain the BATA and BAIFA Regional Communications Network which serves the express lane toll system • Oversee civil work • Coordinate with other express lane operators in the region and throughout the state
Bay Area Toll Authority (BATA)	Tolling Implementation and Operations	• Regional Customer Service Center (RCSC) operations – Oversee the RCSC contract and manage the FasTrak accounts • Procure FasTrak transponders • Implement backhaul communication network
MTC Service Authority for Freeways and Expressways (MTC SAFE)	Freeway Service Patrol (FSP)	MTC SAFE works in conjunction with CHP and Caltrans to implement various motorist aid programs.
Xerox	Incumbent RCSC Contractor	Contracted by BATA to develop, deliver, and maintain the RCSC.
California Highway Patrol (CHP)	Express Lane Enforcement	• Perform on-site enforcement of express lane eligibility • Lead response functions related to incidents • Provide enhanced enforcement for installation and maintenance activities • Assist with traffic control activities

Entity	Role	Responsibilities
Caltrans	Express Lanes Traffic Operations and Owner of State Highway Facilities	• Review and approve all plans, specifications, and estimates, design and traffic operation plans, including construction and maintenance activities within state right-of-way • Monitor the operation of the freeway and initiate corrective actions when needed to ensure motorist safety • Operate the District 4 Traffic Management Center (TMC) with the ability to request override of the express lane Variable Toll Message Signs (VTMS) • Control regional Advanced Traffic Management System (ATMS) • Maintain all civil roadway elements of the express lanes • Monitor the performance of HOV lanes in accordance with statutory requirements • Operate and maintain the freeway performance measurement system (PeMS)
Toll System Integrator (TSI) (TBD)	Toll System Design, Development, Installation, Testing, Maintenance, and Operations	Contracted by BAIFA to implement, maintain, and operate the ELN Toll Collection System (TCS) and all tolling equipment.
TBD	Express Lane Roadway Operator/ Operations	• Monitor traffic sensor network on the ELN • Actively manage traffic to maintain maximum performance of the express lane corridors • Change toll rates on a real-time basis • Monitor express lane activity and traffic conditions • Respond to incidents and issues using manual controls or system overrides provided through the ATMS and/or TCS Graphical User Interface (GUI)
TBD	Backhaul Maintenance Contractor	• Monitor, maintain, and repair the communications hardware, software, and service between the roadside network and TCS Host, and between the TCS Host and other systems that interface with the TCS

Entity	Role	Responsibilities
Alameda County Transportation Commission (ACTC), Contra Costa Transportation Authority (CCTA), Solano Transportation Authority (STA), and Santa Clara Valley Transportation Authority (VTA)	Congestion Management Agencies (CMA)	• Participate jointly with MTC, CHP, and Caltrans in the planning and delivery of express lane improvements for the MTC Program within their respective counties. The CMA may act as the lead for one or more phases of delivery (environmental, design, advertise and award, or construction) for the civil component of the express lanes. Except where noted below, the leads for specific phases have yet to be determined. • For express lanes that are owned and operated by ACTC or VTA, coordinate operations with those of the MTC express lanes

Business Processes Overview

This section outlines the basic business processes that the express lane system will perform.

- *Transaction Creation:* The lane equipment uses Violation Enforcement System (VES) cameras and Automatic Vehicle Identification System (AVI) antennas to identify individual vehicles in tolling Zones and create Lane Transactions. The Host computer matches the individual Lane Transactions at each Read Point across tolling Zones to build a single Trip Transaction to send to the RCSC for posting to customer accounts.
    - **Identify vehicles at the Read Point**
    - **Create Lane Transactions at the point of detection (i.e., at the Lane Controller)**
    - **Create Trip Transactions at the Host**
    - **Transmit ELN Trip Transactions to RCSC**
- *Maintenance and Operations*: This function includes monitoring the health of the system, setting toll rates, operating hours, and traffic monitoring. ELN operations also logs system performance and information technology (IT) issues. These functions are supported with reports, screens, and alerts.
    - **Calculate and display toll rates using Dynamic Pricing**
    - **Correct transactions**
      In the event of a traffic incident, this process allows express lane operators to correct the toll rate associated with a set of Lane Transactions. These corrections will be rolled up to correct the tolls associated with Trip Transactions. The process may occur prior to or after the system sends Trip Transactions to the RCSC.
    - **Monitor road operations**
      Both on an ongoing and a historical basis, BAIFA monitors toll rates and their effects on traffic movement in the express lanes and associated general purpose lanes. The system collects, stores, and reports on data to support this process.
    - **Monitor system performance**

Both on an ongoing and a historical basis, BAIFA monitors the performance of the TCS itself. This system collects, stores, and reports on data to support this process.

- *Auditing*: The auditing function includes reviewing controls and variances for the transaction creation and operations function. Data is collected, summarized, and analyzed to monitor for system and other variances to minimize revenue loss.
    - **Exception monitoring and control**
      The system will mark as exceptions Lane Transactions that it cannot associate with Trip Transactions and/or other exception conditions.
    - **Daily audit process**
      Daily electronic toll registrations are compared to the amounts recognized as revenue and deducted from the customers' prepaid accounts as reported by the RCSC to determine the integrity and accuracy of the electronic toll collection.
- *Accounting/Financial Reporting*: The financial reporting/accounting function includes financial reporting for BATA's revenue operations. The information processed here summarizes the revenue and traffic financial results.
    - **Revenue Day close**
      At the end of each Revenue Day, the system reports all Lane Transactions by Zone, all Trip Transactions by Corridor, and expected revenues for the Revenue Day by Zone, by Corridor, and by county and for the entire ELN. The system accounts for all transactions and consolidates the revenue into accounting periods by Revenue Day segments that roll-up into a Revenue Day. Proper cutoffs are a generally accepted accounting principles (GAAP) requirement.
    - **Confirm daily revenue**
      The purpose of this process is to allow Finance to confirm that all expected revenue for the Revenue Day is accounted for and reconciled to expected revenue sent to the RCSC. Finance also confirms that total expected ETC revenue reconciles to the total ETC postings reported by the RCSC. Finance examines all variances.
    - **Daily reporting of revenue and traffic**
      The purpose of this process is to recognize and record the daily toll revenue, both transponder and image-based, by Zone and by Corridor. The daily revenue data is used for financial reporting of all toll revenue.
    - **Monthly audit and revenue reporting process**
      Finance prepares monthly toll revenue reports for financial statements and various other reporting purposes. The system will summarize the revenue by Corridor and by county. The daily revenue data are consolidated to the monthly reports. The standard monthly production reports provide support to Finance's manual entries into the integrated financial and administrative solution (IFAS) accounting system and an overview of the monthly toll revenue integrity and trends. The monthly ELN reconciliation reports also provide an overview of internal controls, RCSC reconciliation information, and the average tolls applied for each Zone.

Business Rules

1. Using the Express Lanes

This section presents the business rules governing proper use of the express lanes by drivers. The assumption for this version of the ELN Business Rules is that the ELN will honor the same account types BATA honors.

1.1 Permitted Vehicles

BR ID	Rule	Last Changed
1.1.1	Only vehicles with two axles, including motorcycles, are permitted to use the express lanes. [Federal Surface Transportation Assistance Act of 1982 §§167, CVC §§21654]	
1.1.2	Any vehicle carrying a trailer or towing another vehicle, and vehicles with more than two axles, are not permitted to use the express lanes. [CVC §§21654]	
1.1.3	Regardless of weight and vehicle class restrictions, public and private buses are permitted to use the express lanes. Buses that do not meet MTC/BATA's definition of a "commute bus" must meet occupancy requirements and have a Switchable Transponder to receive HOV discounts. [See http://bata.mtc.ca.gov/tolls/schedule.htm]	
1.1.4	Vanpools must carry Switchable Transponders and meet occupancy requirements to receive HOV discounts.	
1.1.5	Vehicle classes that are not permitted in the express lanes will be charged a toll in accordance with the setting of their transponder (and toll violation penalties if applicable).	
1.1.6	All vehicles without transponders will be charged the SOV toll (and violation penalties if applicable).	
1.1.7	Vehicles with paper dealer plates are required to carry a valid transponder to use the express lanes. Vehicles that do not have a transponder and are without registered license plates are subject to citation by the CHP.	
1.1.8	Vehicles with obstructed, improperly mounted, illegible, or missing plates are required to carry a valid transponder to use the express lanes. Vehicles with obstructed, improperly mounted, or illegible license plates that do not carry transponders are eligible for citation by the CHP.	
1.1.9	Inherently low emission vehicles (ILEV) (currently including partial zero emissions vehicles (PZEV) and compressed natural gas (CNG) vehicles) with any number of occupants (including single occupancy) receive the three or more passengers (HOV 3+) toll on the ELN, provided they display a valid white or green DMV-issued decal and carry a Switchable Transponder set to the HOV 3+ position. [Ref. CVC §§5205.5 and 21655.9.]	

1.2 Exempt Vehicles

BR ID	Rule	Last Changed
1.2.1	Authorized emergency vehicles are exempt from the requirement to pay a toll if, and only if, all of the following conditions are met: • The vehicle is properly displaying an exempt California license plate, and is properly identified or marked as an authorized emergency vehicle. • The vehicle is being driven while responding to an urgent or emergency call, or engaged in an urgent or emergency response. • The driver of the vehicle determines that the use of the toll facility shall likely improve the availability or response and arrival time of the authorized emergency vehicle and its delivery of essential public safety services. [Ref. CVC §23301.]	
1.2.2	Any vehicle granted toll-free travel on some or all of the ELN must be equipped with an agency approved and issued non-revenue transponder or have a license-plate based non-revenue account established. Non-revenue access to the express lanes does not guarantee toll-free travel on any other toll facility. Non-revenue access to any other toll facility does not guarantee toll-free travel on the BAIFA-operated express lanes.	

1.3 Access to the Lane

BR ID	Rule	Last Changed
1.3.1	The express lanes provide continuous access, in which access to the express lane is not restricted to designated locations. Instead, vehicles are able to enter and exit the express lane at any point designated by skip-stripe pavement markings.	
1.3.2	At designated locations, the ability to enter and exit the express lane may be restricted for safety or other operational reasons. Restricted access sections are designated by solid double stripe pavement markings to separate the express lane from the adjacent general purpose lanes. Solid double stripe pavement markings are illegal to cross and such maneuvers are enforceable by the CHP.	

1.4 Customer Pre-Enrollment

BR ID	Rule	Last Changed
1.4.1	All customers must enroll with the FasTrak RCSC for a registered account (FasTrak Account, License Plate Account, or One-Time Payment) prior to travelling the express lanes in order to avoid receiving a Violation Notice.	
1.4.2	Drivers who incur a toll and do not have a registered account eligible for posting the Trip Transaction at the time of travel will be issued a Violation Notice from the RCSC.	
1.4.3	FasTrak customers must equip their vehicle with a properly mounted transponder prior to travelling in the express lanes.	
1.4.4	Valid FasTrak Account holders travelling without a transponder but with their license plate listed on the account will be charged an Image Toll (ITOL) to their account.	

BR ID	Rule	Last Changed
1.4.5	Motorcycles are required to be equipped with a transponder; however, carrying a transponder will not prevent a motorcycle from receiving the lowest HOV discounted toll. All motorcycles equipped with Switchable Transponders should have the transponder switched to HOV 3+.	
1.4.6	The registered account must have either sufficient prepaid balance or a valid credit card on file in order to be eligible for posting the Trip Transaction.	
1.4.7	Trip Transactions that post to a License Plate Account may incur an additional service fee (configurable at the RCSC).	
1.4.8	A Trip Transaction will be associated with an eligible registered account by either transponder ID or license plate number and state.	
1.4.9	Customers driving rental cars associated with plate-based FasTrak accounts may use the express lanes. Trip Transactions will post to the rental car account. It is the responsibility of the customer to check with the rental agency and to make sure they are opted in to use the rental toll payment program. Customers in rental cars are not eligible for HOV-tolled travel on the express lanes unless the rental car is equipped with a Switchable Transponder or the customer is traveling with a personal Switchable Transponder.	
1.4.10	Vehicles with metallic windshields should use a bumper mounted transponder or be registered with a License Plate Account. Vehicles with metallic windshields cannot receive the HOV discount.	

1.5 High Occupancy Requirements

BR ID	Rule	Last Changed
1.5.1	The high occupancy requirement for the ELN is two or more passengers (HOV 2+) in each permitted vehicle unless otherwise specified for a particular Corridor. [See http://rideshare.511.org/511maps/hov_lanes.aspx]	
1.5.2	Motorcycles are considered to be meeting HOV requirements on all facilities regardless of the occupancy required. [Title 23, United States Code (U.S.C.), Highways, §§102]	
1.5.3	Two-seater vehicles with two occupants are considered to be meeting HOV requirements on all facilities regardless of the occupancy required. [California Streets and Highways Code §§30101.8]	
1.5.4	Carpool requirements for carpool lanes on BATA bridges apply to the express lanes located at approaches to bridges.	
1.5.5	To be eligible for HOV discounts, customers must have a Switchable Transponder properly installed in the vehicle and the switch must be set to the HOV eligible setting. Switchable Transponders allow customers to declare the number of occupants (1, 2, or 3+) by changing the transponder's switch position.	
1.5.6	Vehicles equipped with standard (non-switchable) transponders or with no transponder will be tolled at the SOV toll rate regardless of occupancy.	
1.5.7	Any vehicle with a Switchable Transponder set to a position indicating HOV status, but that does not have enough occupants to meet the HOV eligibility requirement, is subject to citation by CHP.	

BR ID	Rule	Last Changed
1.5.8	The high occupancy requirement for a particular Zone when it is in HOV only operations is the same as the HOV requirement for that Zone during normal express lane hours of operation.	

2. Express Lane Operations

This section includes business rules for operating the express lanes, which includes managing the performance of the ELN, incidents, lane closures, and use of the dynamic message signs on the ELN corridors.

2.1 Express Lanes Hours of Operation

BR ID	Rule	Last Changed
2.1.1	Express lane tolling hours of operation must be concurrent with hours for which a HOV restriction is in effect. [Ref. California Streets & Highway code §§ 149.7] See Figure 1: Express Lane Hours of Operation	
2.1.2	During all other non-tolling hours, including weekends, the express lanes are available for all vehicles to use toll-free as general purpose lanes and without any occupancy restrictions.	
2.1.3	No vehicle traveling in the express lanes outside the hours of operation will be charged a toll, even if the vehicle is carrying a transponder.	
2.1.4	During non-tolling hours, the system will continue to gather traffic information. Transponders may be read and license plates captured.	

2.2 Operational States

BR ID	Rule	Last Changed
2.2.1	During tolling hours, each Zone can be manually or automatically set to HOV only operations, where vehicles without the required number of occupants to qualify as HOV for the Corridor may not enter the express lanes.	
2.2.2	In HOV only operations, vehicles already in the express lanes that stay in the lane will be charged their locked-in toll rate.	
2.2.3	TBD: Rules for additional operational states and settings to be added here.	

2.3 Incidents

BR ID	Rule	Last Changed
2.3.1	Toll rates for a Zone can be manually overridden by the ELN operator during an incident.	
2.3.2	Toll rate corrections can be made for a specified timeframe for a Zone. All transactions that meet the criteria for the toll rate adjustment will have their toll rate corrected and toll recalculated.	

2.4 Image Capture

BR ID	Rule	Last Changed
2.4.1	Two rear images are captured at each Read Point.	
2.4.2	All images captured for a Trip Transaction will be available at the Host to resolve customer disputes received by the RCSC.	

BR ID	Rule	Last Changed
2.4.3	All images captured will be subject to BAIFA's retention policy and will comply with the BATA PII policy. [Ref. California Streets and Highways Code Sec. 31490]	

2.5 Variable Toll Message Sign Messages

BR ID	Rule	Last Changed
2.5.1	During normal operational state, each VTMS will display a maximum of two destinations and associated toll rates – the price to travel through the current Zone and the price to the end of the current Segment. If the customer is in the final Zone of the current Segment, only that price will be displayed.	
2.5.2	During normal operational state, customers will be charged based on the prices displayed on the VTMS at or immediately prior to the first working Read Point at which they are detected (taking into account the case of offline Read Points immediately prior).	
2.5.3	During normal non-tolling hours, the VTMS will display "open to all".	
2.5.4	In HOV only operations, VTMS in that Zone or Segment and upstream of the Zone or Segment, will display "HOV only" for the Zone and for any Segment that includes that Zone.	
2.5.5	The messages displayed on the VTMS for other operational states are [TBD].	
2.5.6	In the event of a communications failure, affected VTMS will display default rates which are based on historical rates for the day of week and time of day.	
2.5.7	In the case a VTMS displays a partially or completely blank screen, that associated Read Point (for dual VTMS-Read Points, the Read Point at that sign or for standalone VTMS-Read Points, the Read Point(s) immediately after that but before the next VTMS) will not be included in the Trip Building.	
2.5.8	In the case where a VTMS displays a partially or completely blank screen for the entry point of a trip, during tolling hours, customers will be locked-in to the toll rate of the first following non-blank VTMS.	
2.5.9	Toll rates for bridges and other express lane facilities will not be included in rates displayed for BAIFA's express lanes.	
2.5.10	Toll rates for BAIFA's express lanes will be listed separately from other toll bridge and express lane transactions on customer statements.	

2.6 Traffic and Pricing Monitoring

BR ID	Rule	Last Changed
2.6.1	Express lane operators are responsible for monitoring in real-time: • Traffic conditions based on speed and volume, in the express lane and general purpose (GP) lanes • Tolling system equipment health status and real-time transactions at all Read Points (VTMS, Requirements Traceability Matrix , and Maintenance Online Management System) • Other information from Caltrans TMC, television, websites (511.org), and radio	

BR ID	Rule	Last Changed
	• Corridors visually using CCTV viewing, pan/tilt/zoom manipulation for traffic monitoring, and VTMS	
2.6.2	Express lane roadway operations will be responsible for reporting on the performance of the roadway and tolling system including: • Key Performance Indicators • Roadway statistics • Trip Transactions	
2.6.3	Express lanes roadway operations is responsible for: • Traffic incident logging and corresponding toll rate adjustments (if any) • Dynamic pricing/toll rate setting and override • Manual override of VTMS messages • Express lane mode changes, both automatic and manual	

2.7 Transponder Feedback

BR ID	Rule	Last Changed
2.7.1	The transponder will not emit a beep when it has successfully been detected by a reader.	

2.8 Enforcement

BR ID	Rule	Last Changed
2.8.1	One or more beacons installed at each Read Point will illuminate for transponders set to the HOV level required for the Corridor or higher. CHP will monitor vehicles in the express lanes to verify those vehicles declared as meeting the HOV requirement actually meet occupancy requirements.	
2.8.2	After pulling a vehicle over, CHP will use a web portal to query the TCS for transponder ID and/or vehicle license plate to confirm whether customer declaration at the previous Read Points is consistent with observed vehicle occupancy.	
2.8.3	Each CHP officer must use their own unique login credentials when signing on to the web portal.	
2.8.4	After issuing a citation, a CHP officer may use the web portal to immediately email [encrypted] transponder or license plate number query results for court documentation.	
2.8.5	CHP will also enforce lane crossing restrictions, vehicle class, speed, dealer plate, no plate, and other traffic violations in-lane. Such enforcement has no dependence on vehicle occupancy or customer enrollment.	

2.9 Lanes Closures for Toll System Maintenance

BR ID	Rule	Last Changed
2.9.1	The express lanes may be closed as necessary to perform preventive and corrective maintenance on tolling equipment in the lane and on the roadside.	
2.9.2	Maintenance and traffic control activities will follow Caltrans' lane closure guidelines, procedures, and permitting.	

2.10 Performance Monitoring Reporting

BR ID	Rule	Last Changed
2.10.1	Performance monitoring business rules will be compliant with BAIFA operational goals, interagency cooperation, and federal and state requirements.	

3. Express Lane Pricing

The business rules in this section address all the aspects of setting and applying toll rates.

3.1 Toll Rate Determination (Dynamic Pricing Algorithm)

BR ID	Rule	Last Changed
3.1.1	Toll rates are dynamically priced using a demand management algorithm. The algorithm may consider express lane and general purpose lane traffic density and/or volumes and/or vehicle speeds to assess demand and determine the corresponding toll rate.	
3.1.2	The minimum toll rate allowed on the ELN during tolling hours can be set by Corridor, Segment, or Zone.	
3.1.3	If applicable, the maximum toll rate allowed on the ELN can be set by Corridor, Segment, or Zone.	
3.1.4	The Zone toll rate displayed to the public on VTMS signs shall be automatically updated no more frequently than every [TBD] minutes.	
3.1.5	The toll rate in any given Zone will not automatically increase or decrease by more than $[TBD] during any [TBD] minute period.	
3.1.6	The express lane can be set to automatically switch into HOV only operations based on speed, volume, or the toll rate calculated by the Dynamic Pricing algorithm to indicate that only carpool-eligible vehicles are allowed to use the express lane.	
3.1.7	When the express lane is set in HOV only operations, vehicles entering the express lanes but not meeting the occupancy requirement for the Corridor are charged the HOV only toll rate for each Zone travelled that is in HOV only operations.	
3.1.8	When the express lane is set in HOV only operations, vehicles already in the express lanes that are not meeting the occupancy requirement for the Corridor will be charged the locked-in rate for the Zone/Segment.	
3.1.9	The HOV 2+ and HOV 3+ toll rates are separately configurable as a percentage of the SOV toll rate. The percentages are also separately configurable by Corridor.	
3.1.10	Trip Transactions with $0 toll applied will/will not (TBD) be sent to the RCSC for posting at $0 to the FasTrak account on which the transponder ID is listed.	
3.1.11	Trip Transactions with $0 toll applied will/will not (TBD) appear on customer statements.	
3.1.12	If communication to a VTMS is down and the sign displays a historical toll rate, Trip Transactions originating in that Zone would get the lower price between the historical and real-time toll rate.	

BR ID	Rule	Last Changed
3.1.13	If it is unknown what is displayed on a VTMS, Trip Transactions originating at the associated Read Point would get the lower price between the historical and real-time toll rate.	
3.1.14	Toll rates will be rounded to the nearest five cents.	

3.2 Express Lane Definition (For definition of new Corridors, Segments, and Zones)

BR ID	Rule	Last Changed
3.2.1	Each Corridor contains one or more Segments (which separate 'major destinations'). Each Segment contains one or more Zones (or pricing sections). Each Zone contains multiple Read Points (where vehicles are detected by transponder and/or license plate number).	
3.2.2	Each Zone is approximately 3-5 miles in length (the length assumed during conceptual design and therefore the optimal length for the system).	
3.2.3	Zones should be (but are not required to be) kept in a single county.	

4. Trip Building

This section focuses on how Lane Transactions from Read Points are associated into Trips using the Trip Building process.

4.1 Trip Building

BR ID	Rule	Last Changed
4.1.1	Lane Transactions in the same direction of travel along a Corridor will be assembled into Trip Transactions and sent to the RCSC for posting to customer accounts or to Violation Notices (for non-registered license plates).	
4.1.2	No single Lane Transaction will be included in more than one Trip Transaction.	
4.1.3	If a customer exits the express lane and decides to get back in after the allowable travel time passes, two separate trips are constructed and the guaranteed price from the initial entry is considered expired.	
4.1.4	Lane Transactions received at the Host shall be associated to the same Trip Transaction if the Lane Transactions meet at least all of the following criteria: - Transponder ID and/or license plate number identification sufficient for association - Geographically possible sequence of Read Points (for example, northbound progression) - Allowable travel time between Read Points (TBD: the allowable travel time may defined differently for each Zone)	
4.1.5	A Zone will be included in a Trip so long as the number of Lane Transactions for the vehicle is at least the minimum required for that Zone (the minimum can be defined differently for each Zone).	

BR ID	Rule	Last Changed
4.1.6	If consecutive Zones qualify for inclusion in a Trip (based on minimum number of Lane Transactions) and travel occurs within an allowable timeframe given distance and traffic speed, all Zones will be included in a single Trip.	
4.1.7	For vehicles with no transponder, the Lane Transactions will be associated to the same Trip if the license plate number(s) are determined to be for the same vehicle.	
4.1.8	If a transponder ID is detected at all Read Points during a vehicle's travel, a Trip Transaction will be formed based on the common transponder ID.	
4.1.9	If the same transponder ID is not detected at all Read Points, a Trip Transaction will be formed by mapping transponder and license plate information from all the Lane Transactions.	
4.1.10	Although the system will attempt to build and send only one Trip Transaction to the RCSC for vehicles carrying multiple transponders, it is the customer's responsibility to ensure only one transponder is in the vehicle. Vehicles with multiple transponders may be incorrectly charged for their Trips (double-charged or sent Violation Notices for lost/stolen transponders).	
4.1.11	Image-based Trip Transactions (no transponder ID associated with the Trip) are assigned a single occupancy vehicle (SOV) determination and assigned the SOV toll.	
4.1.12	Standard and SOV-declared (at all Read Points) Switchable Transponder Trips are assigned an SOV occupancy determination and assigned the SOV toll.	
4.1.13	Switchable Transponder Trip Transactions with HOV 2+ declaration at all Read Points are assigned an HOV 2+ occupancy determination.	
4.1.14	Switchable Transponder Trips with HOV 3+ declaration at all Read Points are assigned an HOV 3+ determination.	
4.1.15	Switchable Transponder Trips with different switch settings within a single Trip will be assigned (TBD). *Options:* The lowest occupancy of all reads. For example, if a single Trip includes both HOV 2+ and HOV 3+ reads, the Trip is marked as HOV 2+ for pricing. If a Trip includes at least one SOV read, the Trip is marked as SOV for pricing. Configurable by (1) the percent of Read Points detected as HOV-declared, (2) the total number of HOV-declared Lane Transactions, (3) the number of times the switch position changes in a single Trip Transaction, (4) when the switch is made, (5) the order in which the customer changed the occupancy setting.	
4.1.16	The customer is responsible for ensuring that their license plate is not obscured. Obscured license plates could affect the ability of the system to properly build a Trip Transaction and assign the appropriate toll to the customer.	

4.2 Toll Rate Assignment

BR ID	Rule	Last Changed
4.2.1	Customers will be locked-in to (guaranteed) the toll rates displayed on the VTMS directly prior to or at the first Read Point recorded.	
4.2.2	The locked-in toll rates will apply from entry into the first Zone of the Trip Transaction through the last Zone of the Segment for that trip.	
4.2.3	The locked-in toll rates will not change if the price goes up or down while the customer is still in the current Zone or Segment.	
4.2.4	The Trip Transaction toll is the sum of the locked-in toll rates for each Zone in the customer's trip.	
4.2.5	A customer will be charged once for each Zone in a Trip so long as the vehicle was detected at the minimum number of Read Points in the Zone.	
4.2.6	When a vehicle continues into another Segment, it is locked-in for the new toll rates displayed on the VTMS directly prior to or at the first Read Point in the new Segment.	
4.2.7	Vehicles identified as having an HOV occupancy determination consistent with the Corridor's HOV occupancy requirement are assigned the HOV-discounted toll. SOV Trip Transactions are assigned the SOV toll.	
4.2.8	Trip Transactions with non-revenue transponders will be assigned a $0 toll regardless of operational state or Switchable Transponder declaration.	

4.3 Trip Transaction Communication to the RCSC

BR ID	Rule	Last Changed
4.3.1	No more than a single Trip Transaction shall be sent to the RCSC for every unique ELN Trip.	
4.3.2	Each transaction file sent to the RCSC will contain only ETC (tagged transactions) or Image Based Transactions (IBTs) from a single Revenue Day.	
4.3.3	For Trip Transactions with a valid transponder, the Host will send to the RCSC the valid transponder number.	
4.3.4	For Trip Transactions without a valid transponder number (a negative balance, lost, or stolen transponder, or no transponder at all), the Host shall send to the RCSC the transponder number (if available), two images, and an overall confidence level for the Trip Transaction.	
4.3.5	For a Trip Transaction encompassing multiple Zones without a valid transponder number, the Host will send to the RCSC the image that is the most manually readable from the first Zone of the Trip and the image that is the most manually readable from the last Zone of the Trip.	
4.3.6	For a Trip Transaction covering only one Zone without a valid transponder number, the Host will send to the RCSC the two images that are the most manually readable from the Zone.	
4.3.7	The license plate number identified by the toll system equipment for each of the images sent to the RCSC must match the license plate associated with the Trip Transaction after Trip Building. If either of the highest confidence images from the first or last Zone has a different optical character recognition (OCR) result, another image from that Zone that matches the Trip Transaction license plate number will be sent to the RCSC.	

5. RCSC System Processing

The ELN will use the BATA RCSC for processing all Trip Transactions, both those posting to customer accounts and those processing as violations (see Figures 2 and 3). This document includes a subset of the existing BATA RCSC Business Rules where applicable. ELN processing of Trip Transactions and IBTs will be processed according to BATA RCSC Business Rules unless otherwise specified in this document.

5.1 Customer Accounts

Account types and business rules surrounding those accounts types are already established at the RCSC.

BR ID	Rule	Last Changed
5.1.1	BATA bridges and express lanes will support the same account types (i.e., express lanes will not issue invoices).	
5.1.2	Authorized (BAIFA-approved) customers may use non-revenue transponders on the ELN.	
5.1.3	The RCSC will send a final status update for Trip Transactions that post to an account, are paid (i.e., violations), or are rejected at the RCSC. The RCSC will communicate these final statuses using reason codes and posting amounts.	

5.2 Trip Transaction Processing

BR ID	Rule	Last Changed
5.2.1	The RCSC will filter Trip Transactions so that the same transponder ID or License Plate Account is not charged twice for the same Zone within the same Trip Transaction (based on date/time).	

5.3 Customer Statements

BR ID	Rule	Last Changed
5.3.1	Travel on separate express lane Corridors will result in separate Trip Transactions posting to customer accounts and appearing as separate transactions on customer statements.	
5.3.2	Bridge approach ELN Trip Transactions will appear as a separate transaction from the bridge toll and other express lanes Trip Transactions on customer statements.	
5.3.3	Customer statements should include Trip start point, end point, start time, total Trip toll, and added fees (where applicable).	
5.3.4	Customer statements will identify BAIFA as a distinct agency and will be consolidated with other transactions the post to FasTrak accounts.	
5.3.5	Customer statements will identify the Corridor(s) and direction associated with each Trip Transaction line item.	

5.4 RCSC Fare Corrections and Exception Processing

BR ID	Rule	Last Changed
5.4.1	The toll assessed for any Trip Transaction can be changed or reversed through a correction file from the ELN Host.	
5.4.2	Manual toll reversals and adjustments can be applied by an RCSC customer service representative (CSR) upon request from the customer and	

BR ID	Rule	Last Changed
	determination by the CSR of less than desirable level of service for the subject Trip, based on BAIFA ELN Business Rules.	
5.4.3	An RCSC CSR can manually apply a toll reversal without case-by-case escalation to, and approval by, the agency so long as the dispute meets criteria specified in the dispute matrix provided by BAIFA to the RCSC.	

5.5 Violation Processing

The express lane violation processing is based on existing violation processing for BATA toll bridges. This section clarifies important similarities and differences, but does not define all business rules for existing BATA violation processing.

BR ID	Rule	Last Changed
5.5.1	Images for Trip Transactions with no valid transponder will be sent to manual image review if they are not received with sufficient OCR confidence (configurable threshold) to bypass manual review.	
5.5.2	There is no 'grace period' prior to issuance of a Violation Notice. Hence, if no valid customer account exists for the license plate number and/or transponder ID associated with an express lane Trip Transaction at the time the RCSC receives and processes it, the Trip Transaction will go to violation processing.	
5.5.3	Post-registration (of either a FasTrak or License Plate Account) will not prevent receipt of a Violation Notice for the Trip.	
5.5.4	Violation Notices are sent to the registered owner's name and address on file with the California Department of Motor Vehicles (or other US state with an agreement in place).	
5.5.5	All Trip Transactions posted at the RCSC on the same Revenue Day will be sent one Violation Notice.	
5.5.6	No bridge violations will appear on the same Violation Notice as any express lanes Trip Transaction.	
5.5.8	Each Violation Notice will include a $XX [TBD] penalty for each Trip Transaction, in addition to the assigned toll.	
5.5.9	For each Trip Transaction unpaid XX [TBD] days after the Violation Notice, a delinquent penalty of $XX [TBD] will be applied—for a total fee amount of $XX [TBD] per Trip Transaction.	
5.5.10	A DMV registration hold may be placed on a California license plate with Violation Notices unpaid beyond the delinquent notice due date. The registered owner of the vehicle will be required to pay all outstanding tolls, penalties, and fees in order to renew the vehicle registration. Escalation to DMV hold includes an additional $X [TBD] fee per unpaid Trip Transaction. A collection agency may also be used for delinquent violation notices.	

BR ID	Rule	Last Changed
5.5.11	If a customer post-registers the license plate with a new or existing valid account and back-dates the plate effective date to the Trip Transaction date or earlier, the toll amount only will be applied to the account and all penalties will be waived.	
5.5.12	If the license plate number associated with a Violation Notice is successfully matched to a FasTrak account, then the toll amount only will be applied to the customer's account and all penalties waived.	
5.5.13	If a valid account held by the RCSC does not have sufficient funds for the posting of an image-based Trip Transaction, the Trip Transaction will be sent to violation processing, and penalties may be charged.	

5.6 Image Processing

BR ID	Rule	Last Changed
5.6.1	An overall confidence level of 98% or the confidence level to be determined based on an acceptable error (e.g. 5 errors in 1000), shall be required at the RCSC for an ELN image to be processed without image review, i.e. any image with an overall confidence level of 98% or higher shall not be subject to "manual" image review.	
5.6.2	If a license plate requiring image review cannot be identified using the two images provided and according to image review rules, the Trip Transaction is rejected and does not attempt to post to an account or generate a Violation Notice.	
5.6.3	Once the license plate number is identified (with or without manual review), the RCSC will attempt to match the plate to a valid account. If this cannot be done, the Trip Transaction is sent to violation processing.	
5.6.4	[TBD – Rule on how the RCSC selects images on the Violation Notice.]	

6. Customer Contact & Support

BR ID	Rule	Last Changed
6.1.1	General customer service inquiries and account related questions (registration, management, and express lanes Trip Transactions) will be directed to the RCSC.	
6.1.2	BAIFA will provide the RCSC with a matrix of policies and procedures for handling disputes and dispute escalations to the agency.	

7. Financial & Accounting Operations

Standard reporting mechanisms and associated business rules for reconciling transactions, payments, and bank deposits are more thoroughly documented in the RCSC. Business rules within this section identify mechanisms that specifically relate to express lanes.

7.1 Revenue Recognition and Processing

BR ID	Rule	Last Changed
7.1.1	All transactions shall be accounted for and assigned a unique transaction identifier.	

BR ID	Rule	Last Changed
7.1.2	Each Revenue Day is equal to a calendar day.	
7.1.3	Trip Transactions will be assigned to Revenue Days according to the entry time associated with that Trip.	
7.1.4	File exchange reports will show the data and time file transferred to the RCSC, files acknowledged by the RCSC, and response files sent back to the RCSC. This includes both ETC and IBT files.	
7.1.5	Posted revenue will be reported by posted date and business date and by account types including ETOL, ITOL, CTOC, LTOL, ONETOL, and VTOL.	
7.1.6	Host will compare expected ETOL revenue with ETOL revenue posted at the RCSC by Revenue Day and identify all variances.	
7.1.7	Host will compare expected IBT revenue with ITOL, VTOL, LTOL and ONETOL revenue posted at the RCSC to calculate IBT revenue.	
7.1.8	CTOC revenue shall be reported the same as Trip Transactions posted to an account held by the RCSC.	
7.1.9	Non-revenue transactions shall be reported separately.	
7.1.10	Revenue from every Zone must be associated with one or more counties.	

7.2 Adjustments and Corrections

BR ID	Rule	Last Changed
7.2.1	Adjustments and other exception processing may only be performed by authorized personnel.	
7.2.2	Authorized personnel will be able to access a range of transactions to adjust or reverse by one or more Zones and by transaction date and time.	
7.2.3	When making an adjustment, users must enter a comment regarding the reason for the adjustment.	
7.2.4	BAIFA will recognize these adjustments based on transaction date.	
7.2.5	When the system records buffered transponder transactions during a time when the lane has continued to take images, these transactions will not be released for processing.	
7.2.6	Revenue from late transactions will be processed by the system.	

7.3 Revenue Day Audit Review

BR ID	Rule	Last Changed
7.3.1	Auditor will review: • Variance reports and trends after the Revenue Day • Exception transactions, adjustments or reversals, and variances with the RCSC • Daily settlement amount • Monthly reports	

Appendix A

Figure 1 – Express Lane Hours of Operation (as of August 9, 2013)

Corridor	Day of Week	Operating Hours
I-880 (Alameda)	Monday - Friday	5:00AM-9:00AM; 3:00PM -7:00PM
I-680 (Contra Costa)	Monday - Friday	5:00AM-9:00AM; 3:00PM -7:00PM
SR-84 (Alameda)	Monday - Friday	5:00AM-10:00AM; 3:00PM -7:00PM
SR-92 (Alameda)	Monday - Friday	5:00AM-10:00AM; 3:00PM -7:00PM
I-80 (Solano)	Monday - Friday	5:00AM-10:00AM; 3:00PM -7:00PM

Note: High occupancy requirements for each Corridor may be found at http://rideshare.511.org/511maps/hov_lanes.aspx.

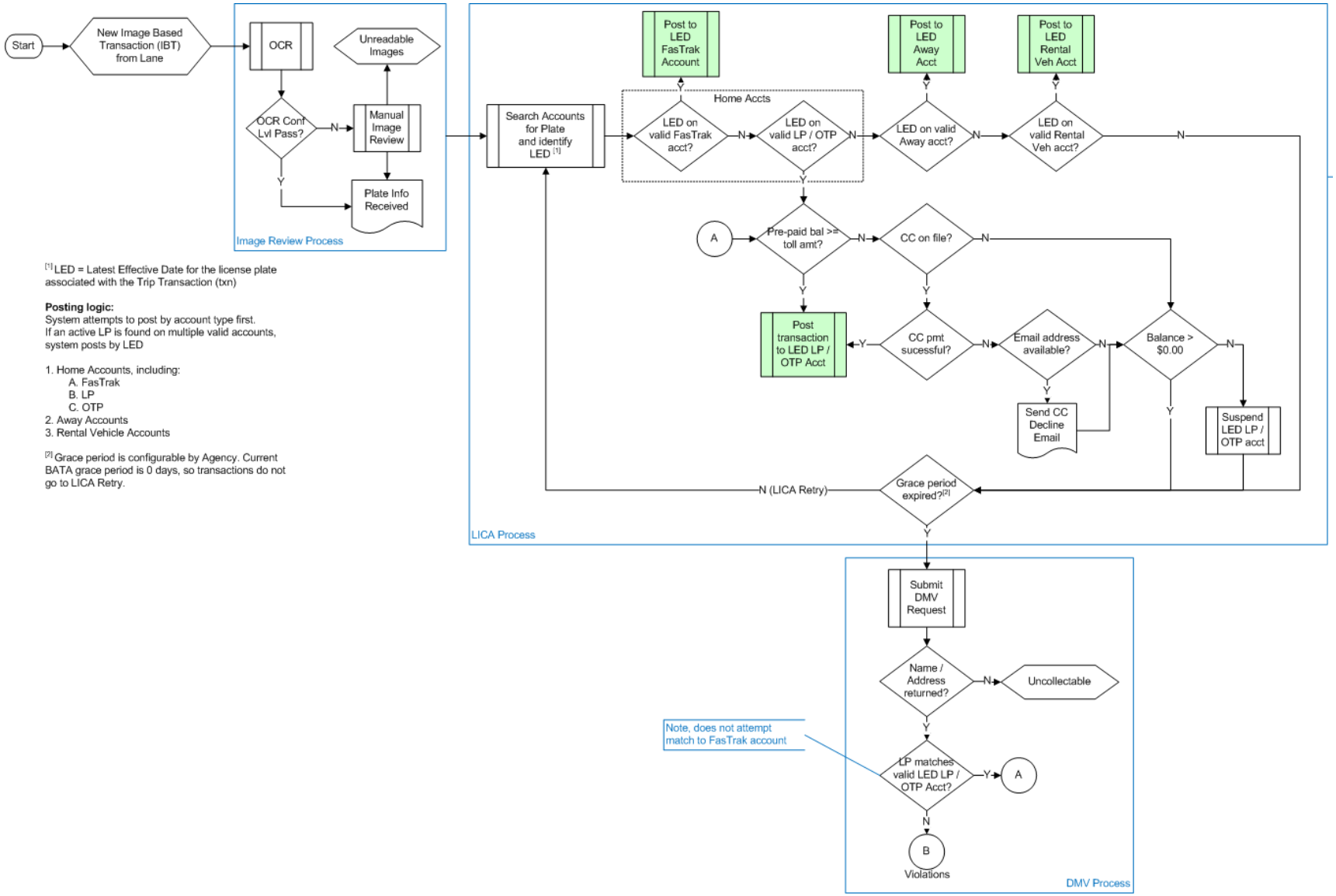

Figure 2 – RCSC Image Based Transaction Processing

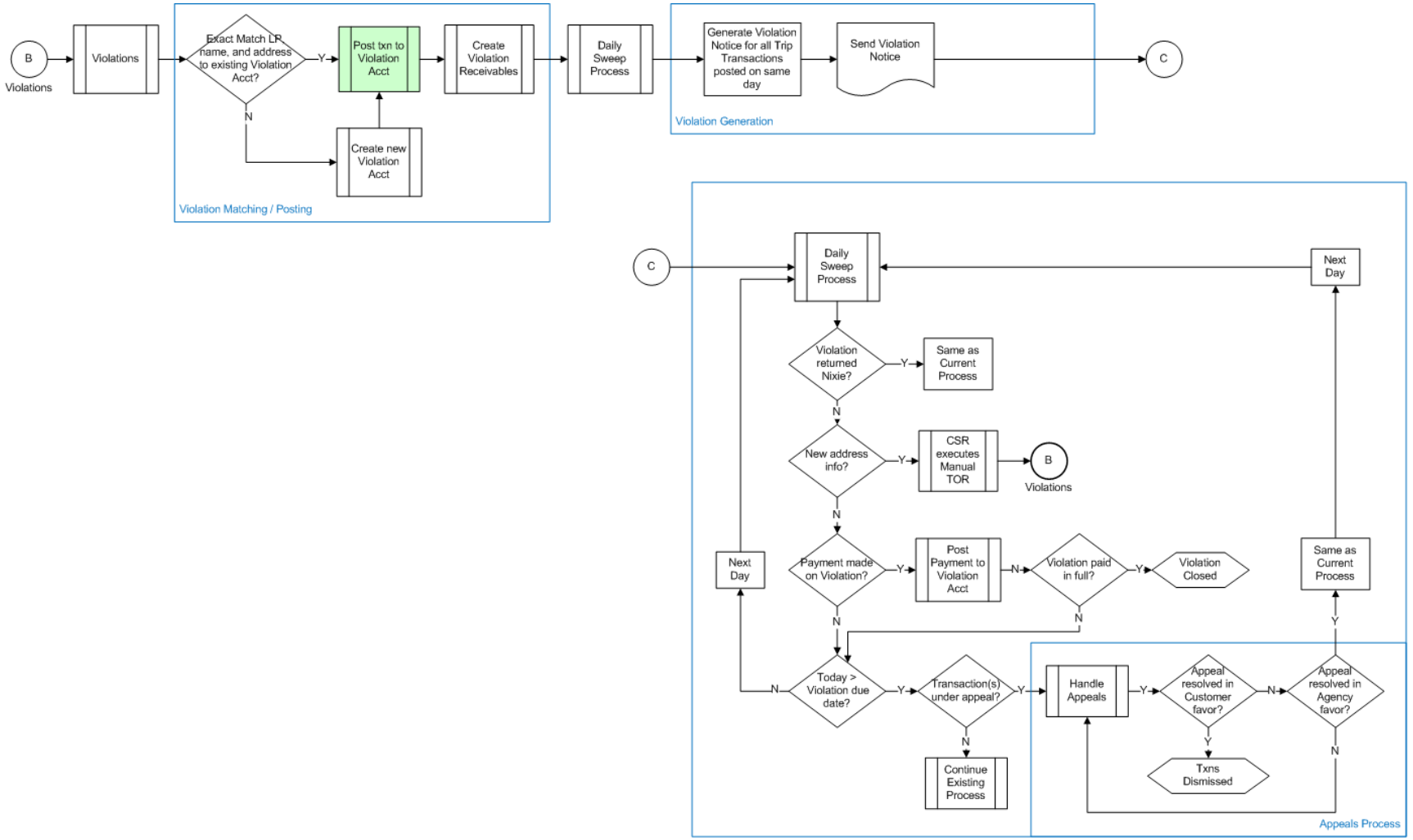

Figure 3 – RCSC Violation Transaction Processing