



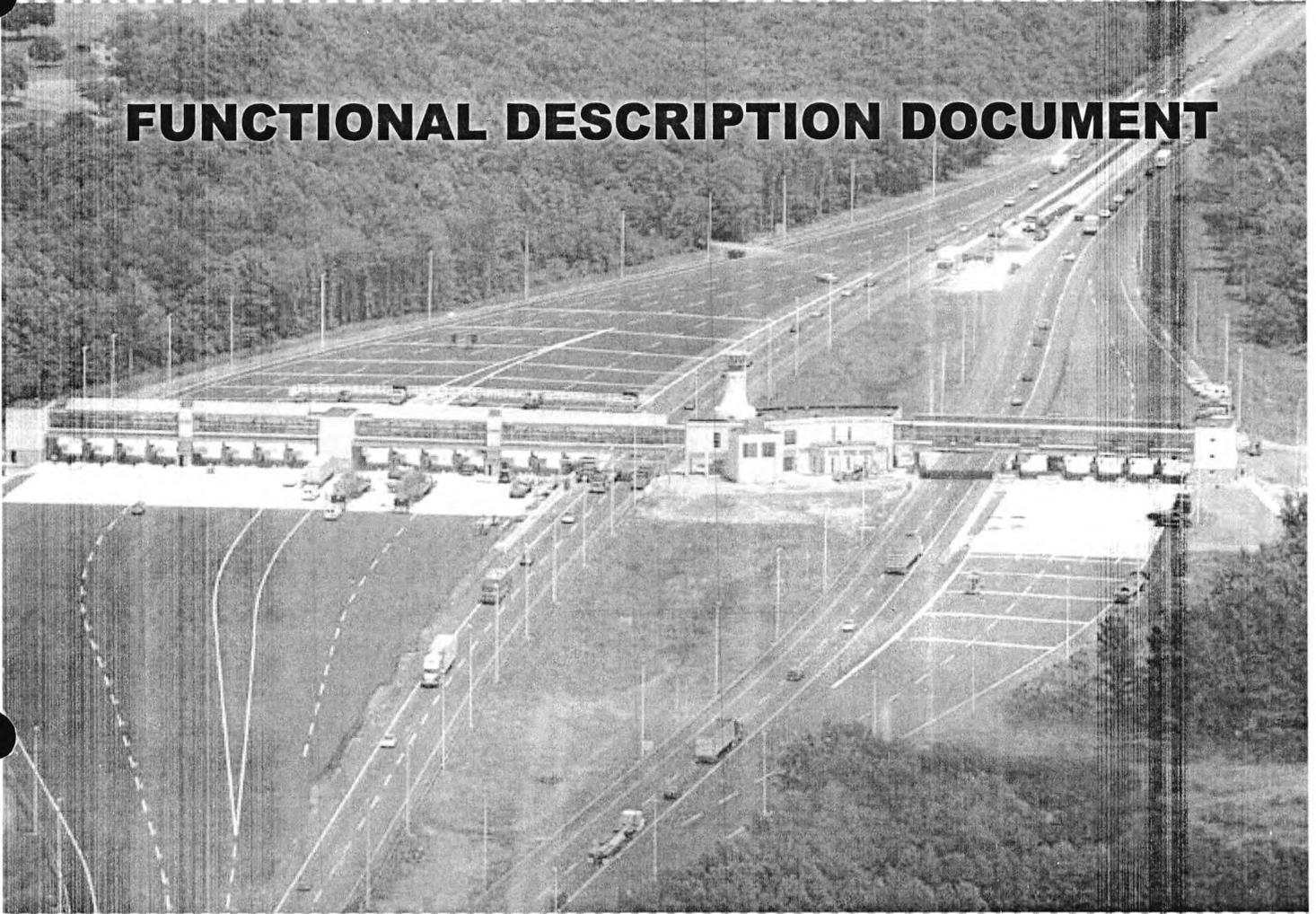
VECTOR
Functional Description Document
Rev. 4.0
May 2008



**"This is what happens when
you have the right company
doing the job."**



FUNCTIONAL DESCRIPTION DOCUMENT



The ACS Transportation Technology Center

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Introduction

Document Introduction

This document is intended to be a high level overview of VECTOR functionality. The targeted audience is the new user, potential customers, and marketing professionals. This document is frequently referred to as a Functional Description Document (FDD). The FDD identifies and describes the functionality of a system or subsystem without focusing on the design. An FDD is not a user manual; it does not describe the steps to perform a function. Typically, it focuses on the capabilities of the system, instead of how the system implements the function.

For the benefit of readers new to electronic toll collection (ETC), this chapter provides an overall introduction into ETC concepts. The VECTOR FDD contains the following information:

VECTOR overview

- High level overview of each VECTOR subsystem
- Description of how the subsystems within VECTOR interface with each another
- Description of external entities that interface with VECTOR
- Description of Inter-Customer Service Center (CSC) agreements and Reciprocity

VECTOR Subsystem Review

- Functional description of each VECTOR Subsystem

System Interface

- Functional description of internal and external interfaces to VECTOR

Appendices

- Options for establishing agency specific business rules for automating VECTOR features
- Standard Correspondence
- Standard Reports with descriptions and sample output
- List of acronyms and glossary of terms



ETC Introduction

This section will address the overall ETC concepts at a high level, and the solution that VECTOR provides.

What is ETC?

ETC uses various technologies to automate the collection of tolls as a vehicle passes through an ETC lane, without requiring the driver to manually pay cash or deposit tokens. This is made possible by the use of battery powered transponder tags that are preloaded with information that makes them unique for each customer. The tag is attached to the customer's vehicle, and is read by special ETC lane equipment as the vehicle passes through. The information obtained is processed, and passed along to host computer systems at customer service centers (CSC) that use it to bill the customer's account automatically.

Lane Hardware

Typically, the lane equipment will consist of the following:

- An Automatic Vehicle Identification (AVI) reader, which uses the radio frequency signal, provided by the customer transponder tag, to uniquely identify the vehicle as it passes through the lane.
- Automatic Vehicle Classification (AVC) sensors, which determine the type of vehicle, so that the proper toll can be levied (i.e., passenger car, car with trailer, semi truck, motorcycle).
- Video Enforcement System (VES) digital cameras, which record the license plate image of vehicles that are violators (i.e., no tag, tag reported stolen, tag does not match classification of vehicle).
- Lane Controller computers, typically personal computer's (PC's) that have been modified for industrial use. The lane controller receives inputs from the AVI, AVC, and VES. It compares the tag information provided by the AVI, and the vehicle classification information provided by the AVC, against a list of customer account tags that have previously been downloaded by an upstream host computer. The lane controller uses the results of this processing to create the transaction that is used to charge the toll (or log the violation if one has been detected).

The section of roadway where the toll lanes are located is called a "plaza." Each plaza usually has a co-resident host computer that collects information from the lane controllers and processes it. The plaza computer(s) communicate with upstream computer(s) that collect all the information together at a central location.

The upstream computer of an ETC system is located in the CSC. The CSC is the focal point for customer enrollment and inquiries, tag handling and issuance, violations processing, and billing. The CSC also maintains and updates the list of valid tag accounts, and regularly downloads this information to the plaza computers.

Customer Service Center

The activities occurring at the CSC can be classified into two categories; those involving direct interactions between customers and CSC representatives, and the “behind the scenes” daily (back-end) processing. Both categories of activity rely upon the features and services provided by our Forte’ software VECTOR application (described fully in later paragraphs). The following paragraphs provide information about each category.

The first category encompasses those processes in which a walk-in customer is involved, including but not confined to:

- Enrolling as a new customer
- Changing the account plan
- Picking up a new tag or exchanging an old one
- Making payments on an existing account via cash, check, or credit card
- Asking questions / making complaints

Customers can also call the CSC to pay their bill by credit card, report their card lost or stolen, or order a new tag.

The second category of “behind the scenes” daily (back-end) processing is comprised of those activities which are vital to the Agency’s program, but do not involve direct real-time toll interactions. Included are:

- **Enrollment processing** - This includes establishing new accounts based upon mail-in, phone-in, walk-in, or electronic web applications. It also includes selection of appropriate tags and information kits to be mailed out to new customers.
- **Existing account management** - This includes the processing of mailed-in check payments to customers’ accounts.
- **Transmission of ETC account tag files to lane controllers** - For each tag in the ETC system, account information is passed regarding its status (open / valid, closed, stolen, balance low, vehicle classification, etc.).
- **Receipt of transaction files from plazas / lanes** - This reflects all ETC activity (tolls, violations, etc.).
- **Financial accounting / reconciliation** - A variety of batch jobs and reports are run to “balance the books” for the day’s transactions and to send deposits to the CSC’s bank. This also includes posting of credit card payments to the Automated Clearing House (ACH).
- **Violations processing** - Violations can be of several types, including no tag, expired tag, stolen tag, vehicle configuration does not match tag, etc. Clerks review the digitized license plate images and record the vehicle plate number. The number is used to contact the Department of Motor Vehicles (DMV) and obtain the owner’s name and address. Appropriate notifications of violations are then mailed out to the offender.
- **Customer mailings** - This includes promotional or informational mailings to existing accounts, or to targeted zip codes or geographic areas.
- **Voice Response System** - This function provides customer support via automated access through a telephone interface by existing customers to their account information.
- **Web server interface** - VECTOR provides a Web page interface to allow potential customers to obtain information about an agency and to enroll online. Existing customers can

perform queries upon their accounts. General information about the programs and links to other sites of interest are also provided via the Web page.



A customer first contacts a CSC to establish an account with an Agency that issues devices. To apply for an account, a customer can employ either the Internet, call a Voice Response System (VRS) and request an application, walk in or phone the CSC and speak to a Customer Service Representative (CSR). CSR's use the Customer Account Management Subsystem (CAMS), with the customer's account application information to establish the customer's account, setup up the billing/payment option desired by the customer, assign one or more devices to the account and establish the Agency discount plans desired by the customer

Behind the scenes, the Device Inventory Management Subsystem (DIMS) maintains the inventory of issuable devices, including those devices, which have been returned as defective or reported stolen. CSR's use the list of issuable devices to assign devices to customer accounts. Once a device is assigned to a customer's account, DIMS is employed to manage the preparation of the device(s) for mailing and delivery to the customer.

For most accounts, a prepayment is required to establish an initial account financial level to which transactions (tolls) will be debited. CSR's employ features of the Financial Processing Management Subsystem (FPMS) to collect and record such customer payments, as well as record device deposits.

With the account established, prepayment received and devices assigned, the next step is providing a device status to the various toll lanes serviced by VECTOR and associated Away Agencies to permit the customer to use their new devices to pay for tolls. The Transaction Processing Management Subsystem (TPMS) receives the physical status of each of the customer's devices and the customer's account status from CAMS. Using this information, TPMS generates a composite device status that includes both the physical device status and account financial status (for example, a customer would not be able to use their device if they had a negative balance on their account or the device had been reported as stolen). The customer's composite device status information is collated with that of other customers, including customers from other Agencies, and sent daily to each Lane/Plaza Management Subsystem (LPMS) directly serviced by VECTOR. Such information is also forwarded daily to each of the Away Agencies to permit the customer to employ his/her device(s) on the lanes serviced by those other agencies.

The LPMS forwards the composite device status message to each of the lanes (or Lane Controller Management Subsystem) it services. The LPMS also forwards the Lane Fee Rate Schedule to each lane (generated by the System Administration Management Subsystem (SAMS)), which specifies the toll amount the lane should charge for different times of the day and/or week. The LPMS is also used to monitor lane operation and status, including possible remote control of the lane (such as activating a lane or changing its mode of operation). LPMS interacts with the Financial Processing Management Subsystem (FPMS) by sending FPMS information on funds collected by toll collectors in the lanes and, in return, being provided information on expected revenue for use in auditing toll collector end-of-shift turn-ins.

With the lane activated, a Fee Rate Schedule downloaded, and the Device Status including the customer's new device(s) downloaded, everything is ready for the customer to employ the system.

When the customer drives through a lane, the lane's Lane Controller Management System (LCMS) detects the device, checks it against its stored device status, provides appropriate feedback to the customer (status display and/or lifting of a barrier), and generates the initial toll transaction using the stored Fee Rate Schedule. The LCMS also will detect if a possible violation has occurred, flag the transaction created as a violation and trigger an image capturing system as needed to capture images

of the customer's license plates (depending upon the type of violation). The LCMS will then forward the transactions and violation images (if a violation has occurred) to the LPMS.

LPMS sends all transactions (both toll and violation) to the TPMS for processing, while violation images are sent directly to the Violation Enforcement Management Subsystem (VEMS) for violation processing.

TPMS receives the toll transactions from its associated lanes and posts them to the customer's account. Since the customer could have signed up for multiple discounts plans, the TPMS will compute the least toll to be charged to the customer and correct the toll reported by the LCMS as necessary prior to account posting. TPMS will forward violation transactions to the VEMS for violation processing.

In addition to transactions from its associated lanes, TPMS receives transactions for its customers that were completed on other agencies' lanes. These transactions are also posted to the customer's account, with appropriate forwarding of the amount due to the other Away Agency, which originated the transaction.

VEMS will link the violation transactions and images, and batch them for review by a CSR. The CSR will record the license plate number and state, and other information concerning the violation indicated on the image (for violations where the device was not read or read in error). VEMS will look up the license plate in its' database of license plates numbers, and if not found, will send a request to the Transportation Information Management System (TIMS,) an ACS system external to VECTOR. TIMS will aggregate VECTOR's requests with other Away Agencies, before sending a request to the appropriate state's Department of Motor Vehicles (DMV), in order to obtain the mailing address to which a violation notice can be sent. Armed with an address, VEMS will send violation notices to an external Mail House for delivery to the violator. VEMS also manages the various levels of noticing, including customer appeals. VEMS will also work with CAMS to establish new accounts for violators to track payments and activity. Payments for violations are processed by the FPMS and forwarded to VEMS as part of the violation management process.

The FPMS is the subsystem that handles all financial actions including receipt of customer payments (including violation payments), device deposits, billing of customer credit cards (including interaction with external Credit Card Processors), and referral of delinquent accounts to an external Collection Agency. It also provides the information to both LPMS and CAMS for auditing funds collected by lane toll collectors and CSC CSR's, respectively.

As the customer uses the system, his/her account balance drops. When the rebill threshold is reached, CAMS will forward a credit card billing request to the FPMS to appropriately bill the customer (for customers who established automatic credit card rebilling). CAMS will also generate the periodic customer statements that will detail the customer's usage of the integrated toll system. FPMS receives all funds from customers (credit card billing, check or cash) and forwards payment information to CAMS for posting to customer accounts.



1.1 VECTOR Subsystems

1.1.1 Customer Account Management Subsystem (CAMS)

VECTOR provides the capability to open and maintain various types of accounts (private customer, commercial, non-revenue, and business account). It keeps a comprehensive history of account activity (payments, tolls charged to the account, violations). Various methods of account replenishment are allowed: Cash, check, automatic credit card debit, with the credit card being the preferred method. With credit card replenishment, the account is automatically replenished when the available balance reaches a predetermined minimum amount. VECTOR also provides the capability to process Automated Clearing House (ACH) payments.

1.1.2 Device Inventory Management Subsystem (DIMS)

VECTOR provides the ability to track all devices that have been received and distributed. It allows the CSC clerk to determine when more devices should be ordered by showing what is left in inventory. It provides a correlation between device number and account / vehicle assigned to.

There can be different devices for a given account (for example, Mom / Pop / Junior for a private account; devices for multiple vehicles for a commercial account). When a device is assigned, it is encoded with classification information recorded in the VECTOR database, ensuring synchronization with the vehicle device class and user information.

Most device assignments are done via "batch device assignment," a batch job that runs overnight and assigns inventoried device numbers to each new account.

VECTOR is also capable of managing the inventory of Smart Cards.

1.1.3 Financial Processing Management Subsystem AwayAgency(FPMS)

Financial transaction processing is the set of procedures through which an Agency collects revenue from its customers and other Agency's customers, (if reciprocal agreements are in place). VECTOR allows a customer to pay by phone, mail, or in person. In order to pay by phone, a customer must provide valid credit card information to a customer service representative (CSR). VECTOR also supports both online and manual credit card validation. VECTOR links the payment method to the actual transaction, i.e., the number of the check is entered when a payment is made. Mail payments are generally made by check, and walk-in service centers allow customers to pay by cash, check, or credit card.

Cash and check customers will receive a request for payment in the mail that is sent along with their account statement. Credit card customers can permit VECTOR to automatically bill their credit card whenever the balance falls below a preset threshold. This process is referred to as credit card replenishment.

1.1.4 Transaction Processing Management Subsystem (TPMS)

Transaction processing involves the dissemination of device status (based upon customer account information) to the lanes to determine the eligibility of vehicles approaching the lane, the sorting and pre-editing of transactions for distribution to other VECTOR subsystems (i.e., violation transactions will be sent to VEMS for processing), and to perform customer device and account validation. Transaction processing supports reciprocity by receiving and processing Away Agency transactions. It also exchanges the device status, customer demographic and vehicle information. This subsystem also includes transaction posting which computes the toll fare using a number of Agency defined business rules.

1.1.5 System Administration Management Subsystem (SAMS)

VECTOR provides a variety of functions that allow a system administrator to monitor and configure the system. Employees, service centers, and plazas information can be entered into and maintained by the system. Employee roles and assignments can be defined and retained by the system as well.

1.1.6 Lane/Plaza Management Subsystem (LPMS)

VECTOR provides a variety of functions that allow for the necessary monitoring and controlling of the toll collection operations. This includes monitoring the plaza and the tracking of revenue via revenue bags.

1.1.7 Lane Controller Management Subsystem (LCMS)

The LCMS is responsible for interfacing with the lane equipment and correlating the ETC information with other in-lane inputs such as vehicle detection loops and class identification software to determine a transaction. In addition to these functions, this subsystem must interface with other devices to provide driver feedback, thus ensuring that the ETC program is easy for all customers to use.

1.1.8 Violation Enforcement Management Subsystem (VEMS)

Violation enforcement is a combination of clerical activities augmented by VECTOR applications. Violations clerks are assigned a set of violations to process. This requires a visual review of the license plate image associated with the violation, as well as, the details of the particular violation (i.e., stolen device, no device, class mismatch).

Depending upon the nature of the violation, various VECTOR applications are employed. For example, if the violator is a known device holder in good standing and the violation is of a minor nature, the additional charges are added to the owner's account via an interface to account management. The charges will simply show up on the customer's next statement. If the violation is more severe (i.e., no device), then the name and address of the owner are obtained via an electronic interface to the DMV. The information is returned and entered into a different application, which results in a violation notice being sent to the offender.

Similarly, other applications are invoked depending upon the type and severity of the violation. Notifications, warnings, or other appropriate communications are generated and mailed to the

offender. A hold can even be put on the offender's vehicle registration renewal, depending upon the agreements in place with law enforcement agencies in the area in which the violations occurred.

Payments for violations that are received prior to a first notice being generated will be maintained in a violation pre-payment file. These payments can be applied to the violation either pre-notice (via license plate match) or post-notice (violator calls CSC and explains that payment was mailed prior to receipt of the notice). In either case, if the payment amount is at least equal to the toll amount due then any remaining fee balance will be written off. As with normal violation payments, the CSC does not issue a receipt or other confirmation of payment

An auto-payment process can also be set up with the ACH using the customer's bank routing and account number.

1.2 External Interfaces

Figure 1 shows how VECTOR interfaces with various external entities and systems. Each external interface is summarized below.

Customer

A customer is the person or organization who establishes an account and uses the tolls services of an Agency serviced by VECTOR. VECTOR interfaces with the customer (or their representative for organizations) either by mail, through a CSR, via the VRS, or by use of a web interface. For security reasons, all interfaces provide appropriate firewalls to ensure no customer can access directly the core VECTOR system and databases.

Home Agency

A Home Agency is an Agency whose customer accounts reside in VECTOR. VECTOR provides an interface to the Home Agency so that it can process transactions from the lanes and from Away Agencies. Home Agencies may or may not issue their own devices for use in the combined toll system.

Away (or Reciprocal) Agency

An Away (or Reciprocal) Agency is one that has a reciprocity agreement in effect with the Home Agency. Reciprocity refers to the ability of one Agency's device to be used in another Agency's ETC lanes. The toll is then debited from the user's account, and credited to the Agency whose lane was traveled (see section 1.3 below for more information). VECTOR supports reciprocity by enabling the processing of transactions between agencies via the exchange of transaction files, sent at the exchange frequency of the participating Inter-Agency Group (IAG) members. Logs are maintained, to track and document the exchange of files, and reports are generated, indicating the number of transactions that have been sent for processing. When the files are received, the transactions are posted to customer accounts and will appear on recurring customer account statements. Away Agencies may or may not, issue their own devices for use in the combined toll system.

Customer Service Representative

A CSR is an employee of a CSC who interacts with customers to process their requests. CSRs interact with VECTOR through an online GUI. CSRs are responsible for most of the activity at CSC's.



Web

VECTOR provides an interface for the online web page applications using an internet Web Browser. Customers can update and obtain information about their accounts (current balance, latest replenishments, and recent tolls) and perform various other functions. Due to the multi-tiered architecture of VECTOR, the end user never directly accesses the account database on the host. Instead, the user's inquiry is entered into the web server application, which in turn retrieves the requested information from the database server only after appropriate validation processing has occurred. This ensures the integrity of the database at all times.

Voice Response System

A customer who employees the VRS, using their touchtone telephone, receives spoken information in return for their numeric keypad selections. Customers can access the VRS via their telephones to make inquiries and perform other transactions, such as updating a credit card expiration date or requesting information. VECTOR provides an interface between the VRS software and the account information stored in the database.

Credit Card (CC) Processor

The CC Processor is utilized to transfer funds from a customer's charge card to the CSC's bank account when customers make credit card payments. The CC Processor is accessed either manually (as is the case when a customer presents his/her card to a CSR, who "swipes" the card and thus transmits the transaction data) or automatically (when batch jobs processing monthly replenishments, transmit the transactions for multiple customers). In either case, the customer's card is debited and the correct amount is added to the CSC's bank account (and to the customers toll account as appropriate).

Mailing House

The CSC utilizes the services of a commercial mailing house to prepare and send out customer notices, letters, statements, and promotions. The account information is provided to the mailing house via File Transfer Protocol (FTP) of an ASCII text file. The file is of variable length, but each individual record (associated with a user account) is of fixed length.

Department of Motor Vehicles

The interface to the DMV is actually provided by an intermediate application to which VECTOR sends inquiries. Files containing requests for information about license plates are ultimately sent to the appropriate state DMV. The information received from the DMV, populates a vehicle profile database containing the plate numbers with the names and addresses of the vehicles' owners. Such information is used primarily for violation enforcement.

Collection Agency

The CSC utilizes the services of a collection Agency to collect overdue funds. In a manner analogous to the mailing house, the account information is provided to the collection Agency via FTP using a fixed record length ASCII text file.

Automated Clearing House

Payment can also set up through the ACH debit using the customer's bank routing and account number.



1.3 Reciprocity

Reciprocity is the term used to describe the Inter-Agency agreements that allow customers from one Agency to use their device on another Agencies facilities without needing to have two accounts. The transaction will be sent to the Agency who 'owns' the customer account; that 'owner' Agency will later return revenue to the Agency on whose facilities the motorist drove. VECTOR implements reciprocity in accordance with the policies and guidelines established by the IAG Reciprocity Task Force.

1.3.1 VECTOR to Away Agency

VECTOR provides three basic types of information to reciprocal agencies: Away Agency customer transaction information, Home Agency customer account and vehicle information, and the reconciliation information for Home Agency customers who used Away Agency facilities. This information is distributed periodically in accordance with the guidelines in the IAG Inter-CSC Interface File Specifications document. One transaction type not sent to the Away Agency is violations. Violation transactions are processed by the Agency owning the facilities on which the event occurred. Participating Agencies do, however, exchange customer license plate information to enable their customers to receive a normal toll on Away Agency lanes in the event their device is not read.

1.3.2 Away Agency to VECTOR

In addition to sending information to the Away Agencies, VECTOR also receives and processes information from them. The system combines the Away Agency customer information with its own customers, and sends it to the LCMS as a combined device status. VECTOR also uses the information to process Away Agency violators and sends toll transactions to the Away Agencies for reconciliation.

1.4 Inter-CSC Agreement

VECTOR can support multiple regional CSC's and each CSC may service multiple toll agencies. Reciprocity allows for an ETC program that operates seamlessly across multiple agencies by sharing data on accounts and financial transactions. VECTOR is one of the systems that must participate in multi-Agency reciprocity. The primary focus of reciprocity is basic toll transactions. The IAG Memorandum Of Understanding (MOU) does allow for individual agencies to establish independent agreements, such as the frequency of funds transfer.

1.4.1 CAMS

For all functions in CAMS, VECTOR is configurable to allow CSR's to see the data exclusively from Home Agency or to see the data the Home Agency and Away Agencies. To ensure that CSR's have authority to change only the appropriate account information, VECTOR further has the ability to configure a given CSR's access to a set of data as write, read-only, or no access.

1.4.1.1 Account Establishment

VECTOR does support Inter-CSC customer account establishment. A customer can establish an account at any participating CSC for use at any agency in the agreement. Payments can be taken, devices requested, and any other function, relating to the establishment of an account, may be performed at any CSC. In addition, the customer may participate in any of the supporting agencies' discount plans.

An accounts Home Agency is determined by several factors. First, account ownership is mapped based upon the geographical location of the customer. Each Agency will have geographical areas that will be defined as 'belonging' to them (by state and/or zip code). A customer that requests an account from an Agency's area will be identified as belonging to that Agency. The second factor defining account ownership is the plan(s) that the customer signs up for. If the customer resides in one Agency's geographical area, but primarily uses another Agency's plans, the latter Agency is granted ownership of the account.

1.4.1.2 Account Maintenance

VECTOR permits all of the account maintenance functions, defined in this document, to be performed by any CSR regardless of which Agency owns the customer's account. Thus, a CSR may request an additional device for a customer of Agency 1, and in the very next service call, add a new plan to a customer's account with Agency 2.

1.4.1.3 Account Financials

All of the financial functionality defined in this document is available to the CSR regardless of the customer's owning Agency. Transactions can be posted, payments received, etc. The Home Agency maintains their customer's account balances and will disburse (or collect) payments as necessary.

1.4.1.4 Account History

A CSR can access any customer's account history regardless of which participating Agency owns the account. The account history will be presented as a consolidated report with every participating Agency's transactions listed.

1.4.2 DIMS

1.4.2.1 Inventory Maintenance

Agencies typically encode their devices with an "Agency Code" to distinguish the Home Agency that issues and "owns" the transponder and account. VECTOR can separately manage inventory for each participating Agency within one CSC operation, (i.e., order, receive, track, and assign devices based on individual Agency codes).

VECTOR can also accommodate an Agency's request for a unique label for each device, (i.e., a label for vehicles characteristics for commercial vehicles).

VECTOR can handle inventory maintenance for the Washington DC Metropolitan Area Transit Authority (WMATA) smart cards.

1.4.3 TPMS

1.4.3.1 Transaction Processing

Transaction processing, which includes reciprocity, transaction posting and reconciliation all, support Inter-CSC agreements. Transactions can be received and processed for both Home and Away Agencies for posting and reconciliation purposes.

1.4.4 FPMS

1.4.4.1 Financial Transaction Processing

All of the financial transaction processing functionality defined in this document is available to the CSR regardless of the customer's Home Agency. Agencies can collect revenue from participating agencies if reciprocity is installed.

1.4.4.2 CSR Financial Reconciliation

VECTOR does support Inter-CSC CSR financial reconciliation. VECTOR provides functionality that supports reconciliation for the CSR's financial activities for any participating Agency.

1.4.5 VEMS

1.4.5.1 Toll Evasion (TE)

TE information is not shared between CSCs. Each CSC will process toll evaders independently at their respective facilities. For example, a toll evasion on a facility managed by the Home Agency CSC would have no effect on the processing of a toll evasion by an Away Agency CSC and vice-versa. The two CSCs would, however, share information such as customer license plate numbers, names, and addresses for customers with invalid devices.

1.4.5.2 Class Mismatch (CLMM)

Depending upon the type, as defined by each Agency, CLMM processing could result in the following outcomes:

- Possible adjustment of the toll (increase or decrease)
- Mismatch notification to the customer (including possible penalties)

CLMM transactions are not indicated as such in the IAG Transaction File. CLMM transactions by customers of another CSC, which are adjusted before sending the transaction to that CSC, will not require further processing. CLMM adjustments that occur after sending the transaction to another CSC will require adjustment via the IAG Transaction Correction File. Further, the CSC can elect to adjust CLMM transactions prior to review (method one) or after review (method two).

CLMM information is not shared among CSCs, and each CSC will process CLMM notices, suspensions, or revocations only for their own customers at their own facilities.

1.4.5.3 Speeding

At this time, the IAG has agreed only that the Away Agency will include in the transaction record, an indication that the vehicle was speeding. The following two issues are under discussion as of the date that this document was last updated.

Speed sanctions will involve suspension or revocation of a device or an account by the Home Agency. The resulting invalid device status will be propagated to all agencies. The policies and procedures for speed violations vary among CSCs.

The Home Agency agrees to process all speed violations regardless of facility. If this is agreed upon, agencies need not track speeders from other agencies. Additionally, an appeals process may need to be defined. If this is not agreed upon, then agencies may want to track and send notices to speeders from other agencies. This will require information regarding name, address and additional devices.

1.4.5.4 Lane Exceptions

Certain lanes can be demarcated for use by a restricted set of vehicles. Customers who use these lanes will be sent notices and can be assessed fines. The policies and procedures for lane exceptions are not necessarily the same among CSCs.

1.4.6 SAMS

There is no Inter-CSC Agreement associated with SAMS.

1.4.7 LPMS

There is no Inter-CSC Agreement associated with LPMS.

1.4.8 LCMS

There is no Inter-CSC Agreement associated with LCMS.

1.5 Reports and Correspondence

Experience in designing and developing reports has demonstrated that a flexible system of reporting across varied subsystems and geared to customize Agency requirements, is the preferred approach to report design. This strategy is the most cost-effective and involves the least amount of risk, since this reporting system is already implemented and in production.

The reports are dependent upon a summarization process that VECTOR runs, therefore, the data in the reports can be up to a day old. An Agency can choose to periodically schedule generation of these reports. Some of the reports are also available online and can be generated on demand. These reports are optional and will be implemented as specified by the Agency.

VECTOR supports various automatic noticing (letters). Notices are used for customer statements, notices of violation, verification of PIN/Password change, account retries, verification, proof of residence, insufficient funds notification, credit card expiration, etc. See Appendix B for a list of notices generated by VECTOR.

VECTOR provides a variety of reports for monitoring system status and performances. The types of reports are transaction related, reciprocity-related, finance-related, violations-related, CSC-related, and plaza/host-related. See Appendix B for a list of notices generated by VECTOR.



2. Customer Account Management Subsystem

2.1 Overview

The CAMS encompasses the following functions and processes:

- **Account Establishment** Creating accounts; associating Agency plans; capturing customer demographic information; setting payment method; associating vehicles; generating device requests; and determining the initial payment required.
- **Account Maintenance** Retrieving customer account information; editing account information; recording and tracking customer complaints; credit card expiration date notices; evaluating and adjusting account replenishment amounts; and noticing customers concerning the need to renew periodic plans.
- **Account Financials** Calculating payment amounts; determining and updating account status; handling special toll payments; generating reversals, disbursements and adjustments to accounts; and account replenishment.
- **Account History** Retrieval and viewing of historical account financial payments and disbursement; toll usage; changes in non-financial data; status and history of devices; and a consolidated account history.

2.2 Account Establishment

For issuing ETC devices, VECTOR requires that an ETC account is setup. The accounts can be created via various methods, and can be of various types depending upon the nature of the entity that owns the account.

2.2.1 Account Types

VECTOR supports four basic types of accounts:

- Private
- Business
- Commercial
- Non-revenue

The type of account will determine which set of business rules will apply and what options are available. Table 1 presents a summary of the accounts. Account types can be configurable to a specific type of vehicle.

The **Private account** is for an individual customer who will typically accrue one or two tolls a day. A customer having a private account, leases the device from the Agency rather than purchasing it. The agency may require the customer to make a deposit on the leased device, in order to encourage the customer to return his/her device when leaving the program, for example, in order to get his/her deposit back. Customers must pre-pay private accounts. Pre-paid accounts work much like a banking debit card -- the customer places money in the account and draws down that balance each time he uses a toll facility. The expectation is that the average private account will have one to two devices and one to two vehicles registered against it. This is customizable by Agency.

Business accounts are designed for use by businesses (i.e., taxi fleets, florist delivery fleets). These accounts usually have high toll volumes, a large number of devices, and a large number of vehicles. The devices for a business account are purchased outright. A business account can have an unlimited number of devices and unlimited number of vehicles. The tolls for this account are pre-paid.

Commercial accounts are similar to business accounts in most ways. They generally, have high toll volumes, a large number of devices, and a large number of vehicles. The devices for a commercial account are purchased, not leased. A commercial account can have an unlimited number of devices and vehicles. Commercial accounts are post-paid. However, commercial accounts can be set up with the pre-payment option.

The last type of basic account is the **non-revenue account**. These accounts are typically used by the agents of a toll authority or a government agency, and are accorded free usage of the ETC facilities. The free usage of the facility applies to the Home Agency only. These accounts are not charged any deposits for the devices. If the account holder plans to use facilities that do not honor the non-revenue status of the account (i.e., another Agency), the holder will be required to add a pre-paid payment deposit against a tag to cover the expected usage.

A special type of account that VECTOR supports is a **companion account**. This is used in cases where a customer wishes to participate in another agency's plan, using a single device. Reciprocity allows a customer to use the ETC facilities at any participating agency's facilities, but does not grant

the benefit of the away agency's discount plans. A companion account can be any of the four account types; private, business, commercial, or non-revenue. By creating a companion account, the customer has, in fact, two accounts and has two Home Agencies. That customer will receive two account numbers, two account statements, participate in plans from the two agencies, and have two balances. The only difference is that both accounts are linked to the same physical device.

Table 1 Account Types

Type	Toll Volume	Number of Devices	Number of Vehicles	Tolls Paid	Device Acquisition	Example Customer
Private	Low	Low	Low	Pre	Lease	Joe Motorist
Business	High	High	High	Pre	Purchase	Yellow Cab
Commercial	High	High	High	Post or pre	Purchase	Trucking Co.
Non-Revenue	Varies	Varies	Varies	Pre (Only if the vehicle will use other facilities)	Lease	Agency vehicles

2.2.2 SubAccounts

VECTOR supports multiple SubAccounts that are related to a single account. Every account has at least one SubAccount, but may have many more. VECTOR associates vehicles, devices, and plans with SubAccounts, not accounts. A single SubAccount can contain multiple vehicles, devices, and plans. SubAccounts can also contain additional name and address information for individuals on the main account.

The ability to support multiple SubAccounts provides great flexibility to the VECTOR customer. A private user can have a single account (with a single SubAccount) that lists two vehicles, a single device, and three plans. A business customer can have a single account with multiple SubAccounts (branches) and each of the SubAccounts can have its own contact information (name & address) with multiple vehicles and devices on it. Each SubAccount could also have different plans to support its individual needs. All correspondence will be maintained at the account level. For example, a single account-wide statement would be created instead of individual SubAccount statements. See Table 2 for an example of an account with multiple SubAccounts.

Table 2 SubAccount Example

Account XYZ for Smith Family of 4		
SubAccount 0	SubAccount 1	SubAccount 2
Address: Anywhere USA	Address: Anywhere USA	Address: Anywhere College USA
Vehicles: Family Van (Minivan) Wife's Car (Accord)	Vehicle: Husband's Car (Mercedes)	Vehicle: Son's Car (Civic)
Plans: Standard for both vehicles	Plan: Commuter	Plan: Bridge Specific Plan

2.2.3 Agency Plan Types

VECTOR supports seven main plan types:

- Standard
- Commuter
- Annual
- Residential
- Business
- Commercial
- Non-Revenue

Because the main purpose of VECTOR is to collect toll money, a key question is how much money a given customer should pay upon using a certain toll facility. This calculation of the toll amount varies widely and is driven by several factors:

- (a) The customer's Home Agency
- (b) The customer's identity
- (c) The customer's driving patterns

Frequent user and other discounts (based on special eligibility criteria) are implemented in VECTOR via plans that are added to a customer's account. There are several types of plans that are available to an Agency, that provide flexibility in their implementations. A customer may have more than one plan on his/her account. Table 3 lists the standard plans that are available by account type.

The **standard plan** is available to private and non-revenue accounts. It provides the advantages of ETC without any requirements on usage. The Agency may impose the same toll rate structure on the standard plan holder as it does for cash toll customers, or it may use a reduced toll rate structure to provide more incentive to become an ETC Customer. When ETC customers travel on Away Agency lanes, if no other plan has not been established, VECTOR defaults the customer to a standard plan.

The **commuter plan** is open to both private and non-revenue account holders. This plan offers a reduced toll rate structure based upon a minimum usage, which is Agency specific. There are two types of commuter plans.

- The first version of the plan is for a minimum number of trips in a fixed time period (ex. 20 trips within one month). A trip is defined as driving through a toll facility. If the customer makes more than (or equal to) the required number of trips in the time period, all trips made are at a reduced rate. If they do not meet the minimum threshold for

number of trips made (an incentive device used for commuters), they are charged as if they made the minimum number (at the reduced rate).

- The second version of the plan offers a reduced toll rate for a certain time period or a certain number of trips, whichever comes first. The Agency defines both the time period and number of trips that can be made. The Agency can implement more than one of these plan types with different time periods/trips made. This type of plan is only available to type 2 vehicles (passenger cars).

The commuter plans starts on first usage.

Annual plans are open to private and non-revenue accounts. This type of plan allows a customer who travels on a certain part of a closed loop toll road, to make unlimited trips in a specific time period, for a single, up-front cost (this is Agency defined). By default, the time period is one calendar year with a pro-rated cost for late enrollment. The Agency can adjust the time period to meet its business needs. The part of the toll road that the customer can use may be defined between certain toll facilities or for a certain distance (regardless of where on the toll road they travel). Any travel beyond the defined boundaries will be assessed at the standard rate as defined by the Agency. This type of plan is limited to passenger vehicles only.

The **residential plan** is only open to private and non-revenue account holders. This type of plan is offered to customers who meet some defined residency requirement, and who may be offered a reduced toll rate structure on certain Agency facilities. The residency requirement, toll rate structure (if offered), and the facilities can be defined by the Agency. Non-ETC customers may be offered a special type of this plan. VECTOR can track these customers and provide them with some form of identifier for their vehicle (i.e. windshield sticker) that indicates that they should receive the discounted rate structure when they go through the cash lanes on the Agency's facilities. This version of the residential plan is referred to as the sticker plan. Residential plans are limited to passenger vehicles only.

The **business plan** is open to business and commercial accounts. This plan does not offer any discounts for using the ETC facilities, only the convenience of the cashless toll transaction. A business account is set up on a pre-pay basis. A commercial account is generally established as post-paid, however, it may be set up on a pre-pay basis.

The **commercial plan** is open only to commercial account holders. It provides the convenience of post-paid as opposed to pre-paid tolls. The Agency imposes the toll rate structure and handles all financial transactions (payments, invoicing, reconciliation, etc.) regarding this account.

The **non-revenue plan** is only available to non-revenue account holders. It allows certain customers to use facilities without being assessed a toll. There are three levels of this plan. They are

- facility specific which only grants non-revenue status to customers on a specific Agency facility (or facilities)
- Agency which grants non-revenue status on all facilities owned by a single Agency
- Inter-Agency which grants the status on all facilities owned by the participating Agencies.

For facilities where account holders are not granted non-revenue status, they are treated as a private account holder. In other words, to travel on other facilities, they must have a balance on their account and/or participate in a revenue plan.

Table 3 Agency Plan Availability

Agency Plan	Private Account	Business Account	Commercial Account	Non-Revenue Account
Standard	Yes	No	No	Yes
Commuter	Yes	Yes (for 2-axle)	No	Yes
Annual	Yes	No	No	Yes
Residential	Yes	No	No	Yes
Business	No	Yes	Yes	No
Commercial	No	No	Yes	No
Non-Revenue	No	No	No	Yes

2.2.4 Vehicles

Customers are encouraged to register their vehicles in VECTOR. This will permit license plate-based posting without incurring a violation fine in cases where the device fails to be read and the image review system captures the customer license plate. In contrast, customers whose vehicles are not registered who encounter a tag read error will be assessed a fine once a DMV lookup is completed to obtain a mailing address. VECTOR supports the IAG vehicle type definitions as defined in the Inter-CSC Interface File Specifications. In addition, VECTOR can implement an Agency-defined vehicle class structure that maps to the IAG classifications.

For business accounts, the class/type of the vehicle specified is used to generate a potential list of device requests. An account can have multiple vehicles registered to it. Each vehicle is not required to have its own device, but different devices must be used for different vehicle classes. For example, if a customer owns two passenger cars and a motorcycle they can share one device between the cars, but must have a separate one for the motorcycle because it is a different vehicle class.

2.2.5 Account Establishment Methods

There are three basic ways of establishing an ETC account. The customer can:

- Complete a paper application
- Complete a web-based application
- Apply over the telephone

CSC processing of both the paper and phone-based application methods require the VECTOR client application (i.e., the part of VECTOR software running directly on the PC of the CSR). VECTOR allows agencies the flexibility to choose a subset of these account establishment methods for their customers.

2.2.5.1 Paper Applications

ETC customers, who use a paper application to establish an account, usually have to submit a completed application form. The customer can mail in such an application, or have their account created at a walk-in facility by a CSR. Account applications can also be faxed in, but these are treated as mailed applications for the purposes of reporting. After receiving a paper application, the CSC can scan the application into their system and retrieve the information when needed.

VECTOR permits the recording of name and address information of those individuals requesting application forms. This information is sent to the mail house for application mailing. Applications can also be printed through the web interface if implemented.

2.2.5.2 Web Application

A customer may also apply for an account through an Internet browser. This requires VECTOR to be configured with an optional Web/Voice Response system. With this service, the customer can browse to the Agency's home page and complete an application on-line. The customer must use a credit card to apply in this manner. Alternatively, a customer may print the application form from their browser and submit as a paper application previously discussed.

Payment can also set up through ACH debit using the customers bank routing and account number.

2.2.5.3 Phone Application

The third method of applying for an ETC account is to call the CSC and speak to a CSR. Customers applying over the telephone must use a credit card as well. The CSR will take the customer information over the phone and enter it into VECTOR. Some agencies choose not to allow phone applications, instead directing customers to paper or web applications. This is not a limitation of the VECTOR system, but rather an operational policy elected by the agency to manage costs.

Payment can also set up through the ACH debit using the customers bank routing and account number.

2.2.6 Demographic Information Capture

VECTOR provides the capability to capture and track demographic information associated with an account. Table 4 shows the information that VECTOR is capable of tracking and whether or not it is required.

Table 4 Demographic Information

Information	Mandatory	Notes/Description
Account Type	Yes	The type of account (see Section 2.2.1 Account Types)
Agency/Authority/Facility	Yes	The agency/authority/facility to which the account belongs
Account Number	Yes	System Generated
Driver's License Information (Number, State, Country) Configurable. Can be made mandatory to enforce residency requirements for plan eligibility.	No	Customer's driver's license information
Name (Last, First, Middle Initial, Title)	Yes	Customer's name
Billing Address (Street, City, State, Zip Code, Country)	No	This is where the statements are sent (business and commercial only)
Correspondence Address (Street, City, State, Zip Code, Country)	Yes	This is where the notices and letters (private, business and commercial) are sent

Information	Mandatory	Notes/Description
Shipping Address (Street, City, State, Zip Code, Country)	No	This is where the devices are sent (business and commercial only)
Email Address	No	An email address used for electronic mailing of statements
Phone Numbers (Day, Night, Fax, Cell, Work, Home)	No	Telephone contact information
Statement Delivery Method (Mail, Fax, None, E-mail)	Yes	How the customer statement will be delivered
Statement Delivery Frequency (Monthly, Bi-Monthly, Annually, Never, On-Demand)	Yes	How often the customer statement will be generated
Company Name	*	The name of the company who owns the account
Surety	*	Something like a bond that guarantees payment of account
DBA Name	*	Point of Contact for a business
Tax Exempt (Yes/No)	*	Is the account tax exempt
Second Contact Name (Last, First, Middle Initial, Title)	No	Optional second point of contact for the account

* Mandatory for Business and Commercial accounts. Not mandatory for Private or Non-Revenue accounts.

2.2.7 SubAccount Creation

VECTOR tracks and maintains customer information at the SubAccount level as well as at the account level. Table 5 lists the SubAccount information that is tracked, and whether the information is mandatory or not. SubAccount functionality may be useful for businesses or commercial accounts to track and maintain separate information for different lines of business.

Table 5 SubAccount Information

Information	Mandatory	Notes/Description
Account Number	Yes	Used to link SubAccount to account. System generated
SubAccount Number	Yes	System generated
SubAccount Name (Last, First, Middle Initial, Title)	No	The customer's name associated with the SubAccount
Status	Yes	System generated. Active for SubAccount creation. Other statuses for SubAccount maintenance (see Section C.2).
Requested Devices	Yes	The number of devices requested by the customer for this SubAccount
Assigned Devices	Yes	System generated. The number of devices already associated with this SubAccount
Number of Vehicles	Yes	The number of vehicles associated with this SubAccount
Billing Address (Street, City, State, Zip Code, Country)	No	This is where the statements are sent (business and commercial only). If not entered, will default to account billing address

Information	Mandatory	Notes/Description
Correspondence Address (Street, City, State, Zip Code, Country)	No	If not entered, will default to account correspondence address
Shipping Address (Street, City, State, Zip Code, Country)	No	This is where the devices are sent (business and commercial only). If not entered, will default to account shipping address

2.2.8 Replenishment Information Entry

Only pre-paid accounts in VECTOR have associated replenishment information (see Table 6). This consists of the replenishment method, amount and threshold. The replenishment amount is the actual amount of money that will be deposited to the customer's account when a replenishment event occurs. By default the replenishment amount is equal to the initial payment minus device deposits. The minimum replenishment threshold for an account is configurable by the Agency. VECTOR periodically recalculates the customer replenishment amount based on usage. The customer may replenish the account over the required amount.

If the method of replenishment is credit card, VECTOR will retain the necessary information required to charge the card. When the customer's balance drops below the replenishment threshold, VECTOR will automatically debit the customer's credit card and credit that same amount to the customer's ETC account.

For cash and check customers, the replenishment method is manual. On the bottom of the statement is a payment submittal slip that includes their rebill amount. The customer then submits his/her payment along with the submittal slip to the CSC (by mail or walk in) and the account balance is updated appropriately. The customer also has the option of converting to a credit card method of Replenishment.

Credit card customer replenishment is an automatic process and is referred to as credit card rebill. Replenishment of an account is not allowed via the web or VRS. The process is defined in the FPMS in Chapter 5 of this document.

Payment can also be set up through the ACH debit using the customer's bank routing and account number.

Table 6 Replenishment Information

Information	Mandatory	Notes/Description
Account Number	Yes	Used to link the replenishment information to an account. System generated
Method of Replenishment	Yes	Cash, Check, Credit Card, or ACH
Credit Card Information (Type, Number, Expiration Date)	Yes (if Credit Card Replenishment Method)	Information necessary to charge against a credit card
Replenishment Amount	Yes	The amount that will be credited to the account during replenishment
Replenishment Threshold	Yes	The account balance that will trigger a replenishment action

2.2.9 Vehicle Information Entry

VECTOR provides for the capability to track the customer's vehicle information with the account. This can be used to associate a license plate image with a customer, in the event that the device is not read properly. It also helps to ensure that the customer is provided the proper device type based upon the vehicle used. Table 7 illustrates the information that is captured and which entries are mandatory.

Table 7 Vehicle Information

Information	Mandatory	Notes/Description
SubAccount Number	Yes	Used to link the vehicle information to a SubAccount. System generated.
Vehicle Make	Yes	The manufacturer of the vehicle (Ford, Dodge, etc)
Vehicle Model	Yes	The model of the vehicle (Taurus, Caravan, etc)
Vehicle Year	Yes	The year the vehicle was manufactured
Vehicle Color	Yes	The color of the vehicle
Number of Vehicle Axles	Yes	The number of axles the vehicle has
Dual Axle (Yes/No)	Yes	Whether the vehicle has dual axles (for trucks)
License Plate Number	Yes	The license plate number of the vehicle. System verifies duplication of plate number.
License Plate State	Yes	The state that the vehicle is registered in
License Plate Country	Yes	The country where the vehicle is registered

2.2.10 Initial Device Request

When an account is created, the customer is assigned one or more devices. The maximum number of devices that can be assigned to an account varies by account type as established by Agency business rules. For example, private accounts are typically limited to four devices while commercial, business and non-revenue accounts are essentially unlimited in the number of devices they may contain. The devices assigned to the account are based on the agency issuing the device, the type of mounting for the device (windshield, bumper, other) and account type.

VECTOR allows the CSR to associate a newly requested device with a particular vehicle by associating the vehicle's license plate number with the device number. This is not a VECTOR requirement (i.e., a given device is not required to have an associated vehicle). Table 8 shows the information that is captured by VECTOR in an initial device request and indicates which data is mandatory.

Table 8 Device Request Information

Information	Mandatory	Notes/Description
Account Number	Yes	Used to link the device deposit to an account. Generated by the system.
SubAccount Number	Yes	Used to link the device to a SubAccount. Generated by the system.
Request Status	Yes	New or Pending for initial device request. Other statuses for account maintenance. Generated by the system.

Information	Mandatory	Notes/Description
Request Type (Walk-In, Mail-In, Phone in)	Yes	Indicates how the device request was made. Ability for customers to make Device requests by Web is controlled by agency business rules.
Device Type (Read Only, Read/Write)	Yes	Indicates whether the device is read-only or read-write
Mount Type	Yes	Internal Windshield, External License Plate, External Rooftop
Device Color	Yes	The color of the device. Can be used to identify account types if desired
Device IAG Code	Yes	The IAG code of the device. Refer to Appendix C, Section C.1
Device Count	Yes	Number of devices requested
License Plate Number	No	License plate number of vehicle associated with device
License Plate State	No	State vehicle associated with device is registered in
License Plate Country	No	Country vehicle associated with device is registered in
Device Deposit	Yes	System generated. The amount required as a device deposit

2.2.11 Plan Information Entry

The customer can elect to subscribe to one or more agency plans on his/her SubAccount(s). For example, a customer could sign up for both a discount plan for a specific bridge and for a discount commuter plan for a group of plazas (which could include the bridge in the first discount plan). In this situation, VECTOR checks the toll produced under both discount plans and only posts the minimum toll. Since both of the plans in this example contain the same plaza (the bridge), VECTOR would also record trips through the bridge plaza against both plans to count towards their required minimum number of trips.

VECTOR tracks all of the plans that a customer has signed up for and maintains the link to the customer's SubAccounts. Table 9 shows the plan information that is captured and which fields are mandatory.

Table 9 Plan Information

Information	Mandatory	Notes/Description
Account Number	Yes	Used to link the plan financial information to an account
SubAccount Number	Yes	Used to link the plan to a SubAccount
Plan Type	Yes	See section 2.2.1

2.2.12 Determining Initial Payment

When a customer's account is created using VECTOR, an initial payment is calculated. This payment is based upon the plan type and the account. The algorithm for calculating the amount is customizable by the toll agency. Different account types have different formulas. Usually a credit card payment is not required to make a deposit on a Tag. However, cash and check payment accounts are required to make a Tag deposit.

2.3 Account Maintenance

Account Maintenance refers to the activities performed after the establishment of the account. These activities include updating demographics, vehicles, devices, plans, and making payments to an account.

All of the customer account maintenance functions described in this section (with the exception of the periodic replenishment evaluation) can be performed by the CSR through the VECTOR client GUI.

For additional information on device inventory, see DIMS in Chapter three.

2.3.1 Account Access

Access to a customer account can be gained using a web browser, the VRS, or the VECTOR through a CSR. This section will focus on the VECTOR client application. For a description of the functionality available through the web or VSR interface, refer to section 2.2.5.2 and Chapter 10.

VECTOR controls CSR access to the VECTOR client application by requiring the user to enter a user identification number and password. After logon, the user must then further select one of three modes that characterize their planned interaction with the VECTOR client application. The permitted modes are:

- Walk-In, which provides access to only those client application services suited for handling all walk-in customers to a CSC.
- Mail-In, which focuses on those services for handling incoming customer mail.
- Phone-In which is optimized for handling incoming customer telephone calls.

For example, Phone-In mode can only accept credit card payments from customers while Walk-In supports credit card, check and cash payments.

A Personal Identification Number (PIN) is used to protect customer accounts for VSR and Web access. VECTOR also permits a CSR to enter a customer's PIN as a verification method when dealing with a customer (either a walk-in or phone-in customer). Customers who have forgotten their PIN can request the CSR mail a Customer Profile that, among other things, contains their PIN.

Payment can also set up through ACH debit using the customers bank routing and account number.

2.3.2 Find Customer Account

VECTOR allows a CSR to find a customer's account in several different ways. A customer's account information can be found by entering the account number, a device number, phone number, license plate number, external reference number, violation citation number, application number, customer name, company name, or zip code.

2.3.3 Update Customer Demographic Information

VECTOR allows the CSR to update the customer's demographic information. Examples of the types of information include name, address, phone number, etc. Within VECTOR, they can also assign or reset the customer's PIN. All changes made to a customer's account are logged and an audit can be performed to determine who changed what information and when.

2.3.4 Update SubAccount Information

Within VECTOR, CSRs can update the customer's SubAccount information. SubAccounts can be added, deleted, and modified. The same information identified in section 2.2.7 can be edited (except for account number).

2.3.5 Update Replenishment Information

When a customer establishes his/her account, a replenishment method and amount are specified. Using VECTOR, CSRs can update this information. They can change the payment type (cash, check, or credit card), update the credit card number or expiration date, and change the amount to be replenished. Payment can also set up through the ACH debit using the customers bank routing and account number.

2.3.6 Update Plan Information

Using VECTOR, a customer's plan information can be updated. The following functions can be performed by the CSR:

- Add another plan to the account
- Discontinue a current plan
- Associate a current plan with devices for device-specific discount plans
- Suspend a current plan's trip requirements
- Delete a plan suspension (prior to start of the suspension)

2.3.7 Customer Device Requests

A CSR can accept new device requests from the customer. A device deposit may be applied as per Agency business rules. The same information identified in section 2.2.10 will be entered by the CSR.



2.3.8 Assigning Devices

To support a “Walk-in” customer’s device request, VECTOR allows the CSR to assign a particular device to the customer’s account. This is usually done for a customer who is requesting a small number of devices. The Customer Profile, which is available for printing and distribution to customers, contains a list of all devices assigned to the customer’s account.

While the device number assigned usually comes from the available pool of devices that can be issued, the customer may already possess a device from another Agency, and choose to supply its device number instead of obtaining another device. In this situation, the customer is already the customer of another agency, and merely wishes to establish a companion account with another agency that employs the same device. As discussed under companion accounts, the customer would have two accounts, with initial setup fees, but not be charged a device deposit for the second account.

2.3.9 Batch Device Assignment

VECTOR provides batch device assignment functionality to support a large number of device requests. The system will periodically process all of the outstanding device requests, assign a device to each, and print out the results along with labels for mailing. CSRs can then mail out large quantities of devices efficiently. These parameters are configurable. While VECTOR does not limit a CSR to conditions under which they may use the batch assignment feature, operationally it tends to be limited in use to Commercial and Business account setup, since customers of such accounts typically order large numbers of devices on initial account setup. Any customer who orders multiple devices in one order is suitable for a batch assignment. Private account applications can be processed by telephone or mailed in.

2.3.10 Customer Device Management

CSR’s can perform the following services for a customer:

- Report a lost or stolen device
- Report a defective device
- Accept returned device(s)
- Refund deposits
- Assess a fee (if applicable)
- Replace a Tag

2.3.11 Update Vehicle Information

The CSR can update customer vehicle information:

- Add vehicles to accounts
- Remove vehicles from accounts
- Modify vehicle characteristics (including plate information)

2.3.12 Update Payment Information

During account maintenance, any transaction that requires additional payments can be handled through the maintenance function itself. VECTOR can credit or debit payments to or from the customer's current account balance.

2.3.13 Notes

VECTOR provides the capability to attach text notes to accounts (i.e., tracking customer calls and/or requests). These notes are permanently available with the account for tracking purposes.

2.3.14 Customer Complaints

Customer interaction that requires follow-up action can be tracked through VECTOR's complaint system. Complaints are similar to notes but also have attributes that allow tracking, categorizing, and status providing.

2.3.15 Credit Card Expiration Date Notice

VECTOR captures the expiration date for credit cards that are provided for automatic replenishment. This is done as part of account establishment (Section 2.2). Since a valid expiration date is required to process a credit card, VECTOR notifies customers whose credit cards are about to expire. This notice is generally sent out one month prior to the expiration date of the credit card on record (an Agency determines this time frame). VECTOR can also generate follow-up notices for those customers who still have not updated their credit card information. For a more detailed explanation of credit card replenishment, refer to Chapter 5, section 5.1.

2.3.16 Periodic Replenishment Evaluation

All accounts are periodically evaluated to ensure that the replenishment amounts are equal to one month of the customer's toll usage. There are two types of evaluation; initial and recurring. All accounts are initially evaluated. The initial evaluation is set to occur sometime shortly after the customer establishes the account as defined by the Agency (i.e., 30 days after first toll use). The frequency of the recurring evaluation is determined by the Agency. Some accounts may be exempt from a recurring evaluation for the following reasons; speed suspended, closed (or closed pending), or non-revenue.

If an account has been identified as needing to have the replenishment amount changed, VECTOR will compute the new replenishment amount, notify the customer, and enter a non-financial transaction entry indicating the change. VECTOR will not adjust an account's replenishment amount if it falls below a threshold requested by the customer.

2.3.17 Tag Swap

Tag Swapping is a proactive method for exchanging tags as they reach 7 years from their date of birth. The purpose is to prevent customers with private accounts from returning the wrong tag, all tags on the account with the 7-year-old tag will be swapped (the process will start with the 7 years, then 6 years, 5.5 years etc....). The replacement tags will be assigned to the account and mailed to the customer. It is the customer's responsibility to return the original tags, or be charged with Lost Tag Fees. This will be an ongoing process with a staff dedicated to account and tag handling for the swap.

2.3.18 Discount Plans

Based upon special eligibility criteria, frequent user and other discounts are implemented in VECTOR via 'plans' that are added to a customer's account. There are several types of plans that are available to an Agency, that provide flexibility in their implementations. The main plan types are; Standard, Commuter, Annual, Residential, Business, Commercial, and Non-Revenue.

2.3.19 Periodic Annual Plan Renewal

Renewal notices are sent to customers who participate in periodic plans (i.e., annual plan) approximately 30 to 45 days prior to the expiration date of the plan. The customer can renew by cash, check, or credit card. Cash renewals must be performed at a CSC. Check renewals can be mailed in or be submitted at the CSC. If offered, payment can also set up through ACH debit using the customers bank routing and account number. Credit card renewals can be mailed in, brought in, or phoned in to the CSC. Regardless of the method, once the payment is received, the plan is renewed and the payment is credited to the customer's account.

Sometimes the bank may not honor a customer's check. In this case, a CSR reverses the financial transaction and may enforce a non-sufficient fund (NSF) fee at the discretion of the agency. The CSR then contacts the customer and requests payment for the plan. If the customer does not respond within a certain amount of time, the CSR must delete the plan. The response time is dependent upon the agency's operational procedures. If a valid payment is received, the customer's plan remains unaffected. For declined credit cards, the notification is by way of a report at the CSC. The agency may define an operational process to handle this case.

2.3.20 Unused Commuter Trips

VECTOR allows agencies to define plans that require a customer to complete a certain number of trips within a specified amount of time to qualify for a discounted rate. For a variety of reasons, customers may not meet the minimum number of trips required by this plan type. The difference between required trips and actual trips made is referred to as unused commuter trips. VECTOR tracks these unused trips and will charge the customer's plan account as if they were made (as per the

plan agreement). The number of unused commuter trips is tracked with the customer's account information.

2.3.21 Voluntary Plan Suspensions

A customer may request to have their plan suspended for a certain period of time (i.e., vacation). VECTOR allows a CSR to suspend the account for a minimum of seven (configurable) days. This number is configurable. During this time all plans are on hold. Required trip number and other plan requirements are suspended until the first time the customer uses a facility after the start date. The customer can cancel the suspension prior to its start date by contacting a CSC. Plans may only be suspended a certain number of times over a year. This number is configurable by the Agency.

2.3.22 Account Closing

When a customer closes an account, he/she is expected to return any devices that were not purchased. After the devices are returned to the agency, the CSR will change the account status to closed-pending. Any devices that are not returned to the agency will be marked as sold. The account is marked as closed-pending, and a refund of any outstanding balance will be issued to the customer (this is done operationally, not systematically). The time for this action is configurable by the Agency. This refund will be disbursed in the same manner in which the customer had configured their replenishment (credit card, check, etc).

The agency may also close an account due to a negative balance. In this case, the account is marked as revoked and any devices on the account are marked as invalid. Any further use of those devices will result in a violation transaction and/or device confiscation. In the future, the agency may also elect to send the customer a Negative Account Balance Collection Notice. VECTOR will also provide an interface to allow an Agency to send customer information to a collection agency.

In either case, the customer's account history and information will be retained in VECTOR for an amount of time designated by the Agency.

2.4 Account Financials

VECTOR fully supports management of financial transactions. The four types of financial transactions that VECTOR supports are:

- Payments
- Reversals
- Adjustments
- Disbursements

The following sections describe the functionality of the account financial function.

2.4.1 Payments

As an account is established on VECTOR, the customer makes a payment. The payment categories that VECTOR supports are:

Table 10 Payment Categories

Category	Description
Accounts receivable	Any money received from an outside source. Example payments received by commercial post-paid customers.
Fee	Any administrative cost incurred, i.e., non-sufficient funds, violation fees, replacement of stolen tag
Plan sale	Payment for a one-time discounted cost for travel
Tag deposit	This is the leasing fee for the tag for private vehicles
Tag sale	Payment for tags purchased by business accounts
Toll	The actual amount charged for traveling through a lane. This amount is subtracted from the toll deposit or accumulated and sent via an invoice for postpay accounts.
Toll Deposit	The amount of money a customer pays that will be used to pay for future tolls.

When a payment is made the amount is credited to the customers current balance. VECTOR calculates the customer's initial balance.

Payments for violations that are received prior to a first notice being generated will be maintained in a violation pre-payment file. These payments can be applied to the violation, either pre-notice (via license plate match) or post-notice (violator calls CSC and explains that payment was mailed prior to receipt of the notice). In either case, if the payment amount is at least equal to the toll amount due then any remaining fee balance will be written off. As with normal violation payments, the CSC does not issue a receipt or other confirmation of payment.

2.4.1.1 Method of Payment

VECTOR supports cash, checks, credit card payments, ACH debits and purchase orders. Acceptable credit cards are American Express, VISA, Discover and Master Card.

Payments can be processed at the CSC or the lanes (for tolls). CSC can collect payments from the customer for any reason (device deposits, violation fees, etc.) at the service center. Toll information is captured at the lanes and payments for those toll transactions are deducted from the customers account balance automatically.

2.4.1.1.1 Check Processing

In addition to "one-at-a-time" processing, VECTOR provides the capability to handle batch processing of checks. By using an external device (DP500), batches of payment checks are created. These batches are then processed by VECTOR and are applied against customer accounts based upon the type of payment made.

2.4.1.1.2 Credit Card Payments

Credit card information can be loaded and verified through VECTOR. VECTOR contains an on-line process to receive credit card approval to process the credit card payment. This process is discussed in Section 2.2.8 Replenishment Information Entry.

2.4.1.1.3 Walk-In Customer Payments

To support the functions required by CSRs who handle walk-in customers, VECTOR provides the following capabilities:

- Integrated card swipe to read credit cards
- Check endorser
- Receipt printer
- On-Line cashier settlement functionality

2.4.1.2 Special Toll Payments

As mentioned in earlier sections, payments are made at the CSC for a number of transactions, while others occur as a result of traveling through the lanes. Two types of tolls, the manual and the wave toll require special processing for payment. These two transactions are discussed in the following sections.

2.4.1.2.1 Manual Tolls

In cases where the customer's device fails to be read at the lane, VECTOR provides the functionality to handle manually generated tolls that can be tied to an ETC customer. If this occurs at an unstaffed lane, the toll is treated as a violation and is handled automatically (refer to the VEMS, Chapter 6 for details). If the customer is traveling through a manned lane, the transaction is treated as a manual toll. The toll collector can then capture the device or license plate information manually, and send the transaction information to the CSC. This information can then be entered into VECTOR, to provide a manual posting of the toll transaction to the customer's account.

2.4.1.2.2 Wave Tolls

A special type of manual toll is generated when a customer's device is not properly mounted. This may cause the lane equipment to not read the device. The processing is identical to that for manual tolls, with the added capability to charge a fee, if the toll collector must properly mount the device. The amount charged is specified by the agency.

2.4.2 Reversals

VECTOR supports the functionality to allow for a reversal of all transactions or agency specified transactions. All reversals made are tracked with the customer's account and become part of their account financial history. As transactions are reversed, VECTOR maintains a complete audit trail of the transaction with the original and reversed amounts. The employee's identification number is also maintained for tracking purposes.

2.4.3 Disbursements

For a variety of reasons, the CSR may need to disburse money back to the customer. Examples include device deposits returned for overpayment, and returning balances of closed accounts. Disbursements will be made in the same manner as the replenishment method (i.e. issue funds back to credit card). All disbursements made to a customer are tracked with the account and become part of



the account financial history. The employee's identification number is also maintained for tracking purposes.

2.4.4 Adjustments

VECTOR supports the capability to adjust toll deposit transactions as necessary. All adjustments are tracked with the affected account and become part of the account financial history. For auditing purposes, the record does not get deleted. The original transaction, plus the adjusted transaction will both be stored and displayed. The employee's identification number is also maintained for tracking purposes.

2.4.5 Account Financial Status

As the above-mentioned financial transactions occur, VECTOR automatically updates the customer's account balance and status. The information is maintained and accessible for viewing in VECTOR.

Table 11 Account Financial Statuses

Status	Description
Good	Account balance above Rebill Threshold (for cash customers) or any credit card customers.
Low Balance	Account balance above zero but below the Rebill Threshold (for cash customers). Not a valid state for credit card customers. Note: This is not a valid status for cash customers who only participate in plans that do not charge a toll for each transaction (i.e., annual plans).
Zero Balance	Account balance is less than or equal to zero but above the Negative Balance Threshold (for cash customers). Not a valid state for credit card customers.
Revoked Warning	Account balance falls below Negative Balance Threshold.
Revoked Final	Account balance has been below Negative Balance Threshold for an agency-specified amount of time.
Closed Pending	Account balance zero or more and all non-purchased devices returned.
Closed	Account is closed pending, all non-purchased devices have been returned to the agency and all SubAccounts are closed.

2.5 Account History

The Account History function allows the user to view a general synopsis of the customer account. Specific details can be viewed on financial and non-financial transactions. Financial transaction inquiry screens include Toll History (all toll and non-toll transactions associated with the account) and Financial History (all payment transactions associated with the account). Non-financial transactions include the non-financial history screen (transactions that have nothing to do with money i.e., requests for statements, or requests to add new vehicle to an account), the device history screen and the trips and suspensions screen. The following sections describe the information that can be viewed on-line.

Whenever a CSR modifies a customer account, VECTOR creates an account history record. Given an account number, a date range, and the type of historical information desired, VECTOR will return the requested customer data. Historical information by record type will be retained for a limited time period. This period is configured by the Agency.

2.5.1 Financial Transactions

2.5.1.1 Financial History

This inquiry displays all payments, reversals, adjustments, and disbursements. The following information is tracked and viewable by the CSR; customer name, account number, agency, current account balance, and financial status (good, low balance etc). The inquiry screen shows specific details for each transaction. A typical transaction might look as follows: a transaction that occurred on October 4th and consisted of a check payment of \$25.00.

2.5.1.2 Toll History

The Toll History inquiry screen displays all tolls posted to the account. Data display and retrieval can be restricted to transaction date(s) or device identification number. Agencies can specify the amount of toll history that is maintained on-line. Typically the amount of history maintained is current date plus 90-days. Because of the high volume of toll transaction data, most agencies prefer to archive this data after the 90-day period. Data displayed on this screen includes customer and agency information, device number, transaction date and time, plaza, and discount and full fare amounts. A typical transaction might look as follows: the transaction that occurred on October 22 at 12:15pm on Plaza 15. The discount fare applied was \$1.90; the full fare was \$3.00. The information listed below is available for viewing for each toll type:

- Account balance
- Account name
- Account number
- Agency of account holder
- Agency of toll facility
- Device number
- Discount fare
- Disputed tolls

- End date
- Financial status
- Full fare
- Plan
- Plaza
- Start date
- Transaction date

2.5.2 Non-Financial History

This inquiry encompasses all non-financial information. VECTOR captures information such as previous names and addresses. Currently there are no restrictions on the time period for viewing non-financial data on-line. Agencies may choose to archive this data after a certain amount of time. Information that might be archived include; customer name, account balance, agency, transaction date, type of transaction (add device, generate statement) and the employee ID number of the person who performed the transaction.

2.5.2.1 Device History

This category includes all of the information for a given device, including its last transaction details. The customer name, account number, agency, assigned IAG classification, device status, last transaction date and time and employee ID number of the employee who made the change are displayed. There is no limit on how much history can be viewed on-line.

2.5.2.2 Trip & Suspension History

This inquiry displays trip and suspension history, plan history, number of trips, number of trips charged, along with the amount charged. The inquiry also displays how much money was charged for unused commuter trips. A suspension places a plan on hold. This is usually the case when a customer knows he / she will not be using the commuter plan. A plan can be suspended four times a year for a minimum of seven days (this frequency is set by the Agency). The customer must call and set the start and stop dates. The suspension is lifted any time a trip is made on the commuter plan.

2.5.3 Financial and Non-Financial History

2.5.3.1 Consolidated History

A consolidated history screen allows for separate viewing screens for financial and non-financial history, and for viewing of this information at the same time on one screen.

2.5.4 Customer Statements

Customer statements are generated periodically (configurable by Agency) based upon customer anniversary dates. This date is generally set based on the date the account was established. Because some months do not have more than 28 days, accounts that are created on the 29th through the 31st of the month are given an anniversary date that is the 1st day of the following month. For example, if a customer establishes an account on March 30th, their anniversary date would be April 1st.

When a statement is generated for an account, all payments, reversals, adjustments, disbursements, and tolls for the statement period are reported. The statement period is defined by the Agency. Payments, adjustments and disbursements appear in a customer statement based upon their transaction date, while tolls appear in a statement based upon the date they are posted to a customer account for payment. For example, consider a customer who, on the last day of a statement period, makes a payment on their account and passes through two toll plazas, incurring their tolls. The payment will appear in statement. The tolls in the example will not appear in the statement since they will not be posted to the customer's account until the next morning, the first day of the next statement period. Customer statements do not include any non-financial transactions (such as address changes).

Statements can be sent through the conventional mail system or by email, for customers who have supplied email addresses for this purpose, and on a computer disk. A mail house handles the printing and mailing of customer statements, as well as the emailing. VECTOR packages all of the information and sends it to a mail house for further processing. A flag associated with the mailing notifies the mail house of the delivery method; mail or email, and an email address is provided as needed. For email delivery, the mail house emails the customer, using the email address provided by VECTOR, and includes an internet web site link (good for 30 days), at which the customer can view their statement. Alternatively, the customer can use the Web Interface (see Chapter 10, section 10.2) and use the display history function to view their statement information.

The mail house, once it has taken delivery action, supplies VECTOR with information regarding the disposition of the statements (i.e., date mailed or emailed).

The customer may request statements. The number of previous year statements is determined by the agency. The processing of this statement may take several days.

Table 12 Customer Statement Codes

Toll/Non Toll Category		Statement Codes
Code	Description	
ETOL	Regular ETC TOLL	
VTOL	Violation TOLL	
UTOL	Unmatched TOLL	
MTOL	Manual TOLL	
PSNT	Non-Toll	
PPST	IMG TOLL	
ITOL	IMG TOLL	
XLANE	CROSS LANE TRANSACTION	
UNM MAXTOLL	UNMATCHED MAX TOLL	

Financial Category	
Code	Description
LOSTLIP	Lost LP Tag Fee
REPLEXT	Ext Tag Fee
RETAINED	Retrained Tag Fee
STOLENINT	Stolen Interior Tag Fee
DRBAFTP	DRBA DISCOUNT Plan Fee
GIC	GI Commuter Plan Fee
MDTACMT	MDTA-COMMUTE Plan Fee
PAAB	PA Bridges Plan Fee
PACP	PA Car Pool Plan Fee
Int Tag Dep	Interior Tag Depposit
LP Tag Dep	License Plate Tag Deposit
Ext Tag Sale	Exterior Tag Sale
DPOSCREDIT	Adjustment Tag Deposit Credit
DPOSDEBIT	Adjustment to Tag Deposit Debit

Some of Toll/Financial Codes/Descriptions appear in customer's statements.

2.5.5 Customer Account Profile (or Customer Profile)

VECTOR provides the capability to print a customer's profile. A Customer Profile contains a summary of the customer's account information, including such items as account names (for customers with multiple accounts), mailing address, account PINs, devices assigned, vehicles (including license plate numbers), and associated plans.

Customer Profiles are used, primarily by CSC personnel, to aid in tracking device assignments to accounts. Customer Profiles are also available for printout and delivery to customers to provide customers with a summary of their account setup, including PINs.

An account profile will be generated whenever a new account is opened or whenever devices, vehicles or plans are added to an account.



3. Device Inventory Management Subsystem

3.1 Overview

Device Inventory Management Subsystem (DIMS) supports the following key functions:

- Transponder Inventory Maintenance

Allows the CSR to order, receive, track, and assign transponders for use, when an account is opened or updated. This section will provide an overview of the components of the DIMS in reference to transponder inventory maintenance.

- Smart Card /Transit Card Inventory

Smart Card/Transit Cards are access cards with embedded chips that can record data electronically. These cards are read and updated at a point of issuance (POI) device located at the agency offices and in the ACS Transportation Service Center (TSC) or at a kiosk such as those located in the transit station locations.



Note: A device is an electronic instrument, such as a transponder or smart card, programmed with information that identifies the customer. The customer affixes a transponder to the vehicle (interior or exterior). A reader, at the plaza, detects the presence of a transponder, and the toll is collected automatically.

3.2 Inventory Maintenance

3.2.1 Device Identification

VECTOR allows for a unique device identification number of up to 11 digits. This accommodates coding schemes, which include a three-digit agency ID, and an eight-digit serial number. This number is programmed directly into the device and is assigned to a customer's account.

Each device has a manufacturers' number with the following characteristics:

- Numeric between 100,000 to 99,999,999, right aligned with lead zeros to the left
- Printed on the card (can be read visually)
- Electronically embedded in the card
- Unique within the entire agency inventory regardless of vendor
- No continuity of manufacturer numbers within a box or carton
- Cards are not numbered consecutively or packed sequentially.

Each device, after it is initialized at the POI device in the create mode, has a numeric serial number coded into its embedded chip. The serial number is formatted as d(5)s(10), where d(5) are the five numeric digits denoting the POI device, at which, it was created, and s(10) are the ten numeric serial number digits, based on the time of the POI device, in seconds past midnight of a date in 1980. The serial number is required to make a unique key with the manufacturer number for each card.

3.2.2 Device Characteristics

In VECTOR, devices are identified by a unique identifier called the device character ID. This ID identifies where the device should be mounted (mount type), the device type and color. The following describes the device characteristics.

Mount Type

1. Interior used in most passenger cars (INT)
2. Exterior (EXT)
 - License Plate used for motorcycles and cars with metal oxide windshields.
 - Rooftop used for mounting on the roof of trucks and buses.

Colors

- Black
- Blue
- Ivory
- Orange
- Yellow

Device Type

- Transponder
- Smart Card

3.2.3 Device Status

Each device loaded into VECTOR is assigned a status. As devices exchange hands, the device status is changed to reflect the new status. For example, if a device is returned as damaged, a new status of damaged (VECTOR Status Code 6) is assigned. Initially each device status is set to a status code of 1 to denote "inventory." A partial list is presented below, for a complete list see Appendix C, section C.5.

Table 13 VECTOR Device Status

Code Type	ID	Short Description	Long Description	Meaning
DEVICE_STATUS	1	INVENTORY	INVENTORY	Device is in inventory and is ready to be assigned to a customer
	2	NEW	NEW	A new device is assigned to a customer
	3	ACTIVE	ACTIVE	Device is being used by a customer
	4	PEND CLOSE	PEND CLOSE	Device is closed
	5	RETURNED	RETURNED	Device is returned, but can be reassigned.
	6	DAMAGED	DAMAGED	Device is damaged.
	7	RETURNDEF	RETURNDEF	Device is returned defective to the manufacturer.
	8	LOST	LOST	Device is lost.
	9	STOLEN	STOLEN	Device is reported stolen.
	10	SHIPVEND	SHIPVEND	Device is shipped back to the vendor.
	11	TESTED	TESTED	Device is tested.
	12	RETAINED	RETAINED	Device is retained by Agency.
	13	SOLD	SOLD	Device is sold to a customer.

3.2.4 Vehicle Classes

A three-digit vehicle class identifies a vehicle based upon its number of axles, whether it has dual tires, and its weight. When devices are requested for assignment to a customer's account, they are typically restricted to a specific vehicle class for processing. Table 14 shows some of the common vehicle classes. A more complete list may be found in Appendix C, Section C.1.

Table 14 IAG Vehicle Classes

IAG Class	Vehicle Type	# of Axles	# of Tires	Dual Tires	Over 7,000 lbs.	Description
72	1	2	4	N	N	Automobile/Sport Utility (with possible trailer)
76	1	3	6	N	N	
80	1	4	8	N	N	
84	1	5	10	N	N	
136	2	2	2	N	N	Motorcycle (with possible sidecar or trailer)
140	2	3	3	N	N	
144	2	4	>3	N	N	
200	3	2	4	N	N	Pick-Up Truck (with possible trailer)
202	3	2	4	N	Y	
201	3	2	6	Y	N	

3.2.5 Agency ID

VECTOR allows up to 999 agency IDs. Currently, these IDs conform to the E-ZPass IAG coding values. For each agency ID, an agency abbreviation can be designated, for use in printing transactions details in customer statements.

Table 15 IAG Agency Codes

Agency ID	Agency Abbreviation	Agency Name	Description
000	N/A	N/A	Manufacturer (Mark IV)
001			Regional CSC
002	GSP	Garden State Parkway	New Jersey Highway Authority
003	NJTA	New Jersey Turnpike	New Jersey Turnpike Authority
004	NYSTA	NYS Thruway	New York State Thruway Authority
005	PANYNJ	Port Authority NY/NJ	Port Authority of New York & New Jersey
006	PTC	PA Turnpike	Pennsylvania Turnpike Commission
007	ACE	Atlantic City Expwy	South Jersey Transportation Authority
008	MTAB&T	MTA Bridges/Tunnels	MTA Bridges & Tunnels
009	DRPA	Del River Port Auth	Delaware River Port Authority
010			Smart Tag, Virginia
011			Highway 407, Canada
012			MetroDade, Florida
013	PBA		Peace Bridge, New York
014			Ambassador Bridge, Michigan
015			Illinois State Toll Highway Authority
016	MdTA	Md Trans Auth	Maryland Transportation Authority
017			South Carolina DOT
018	NYSBA	NYS Bridge Authority	New York State Bridge Authority
019	DelDOT	Delaware DOT	Delaware DOT
020			Advantage I-75
021	MassPike	MassPike	Massachusetts Turnpike Authority
022			New Jersey Regional Consortium
023			New Brunswick (Canada) Highway Corporation
024	WVPEDTA	WV Turnpike	West Virginia Parkways Authority
025	DRBA	Delaware Memorial Bridge	Delaware River and Bay Authority
026 – 127	NHDOT	New Hampshire DOT	Reserved for future device issuing agencies
027	BCBC	Burlington County Bridge Authority	
128	ALB	Albany Airport	Albany Airport
129			Buffalo Airport
130	McDonald	McDonalds	McDonalds
131 – 999			Reserved for future non-toll facilities



3.2.6 Device Box

A device box is a container that holds 50 devices. For processing and tracking purposes, each device box is uniquely identified and grouped by agency. A device box is assigned to a CSR. When a customer account is established, the CSR removes a device from the device box for assignment to the customer.

3.2.7 Purchasing Devices

Device ordering from the manufacturer is through a purchase order process. When the inventory of devices needs to be replenished, the clerk creates a purchase order through the VECTOR purchase order function. It allows the clerk to specify a model number, agency ID, quantity, and “ship to” location. By issuing purchase orders, agencies will have full control of the shipment and can make necessary delivery and storage plans. Device programming specifications (agency, revenue type and vehicle class) included on the purchase order are stored in VECTOR.

3.2.8 Receiving Devices

VECTOR provides a function to track the receipt of devices. When the devices are received, an inventory record is created and assigned a box number. The devices are now ready for assignment to a CSC location and individual CSR, via the shipping device screen. As device shipments are entered, VECTOR prints labels for each device storage box.

3.2.9 Shipping Devices

The assignment of devices is handled through the shipping devices screen. This screen provides complete audit ability for tracking device inventory, CSC and CSR assignment.

3.2.10 Straggler Devices

Devices are returned because customers close their accounts, or the device was defective or damaged. Devices that are good are stored in a straggler box for re-assignment.

3.2.11 Transfer Devices

Devices can be transferred from one service center location to another.

3.2.12 Device Check Out/In

To organize and track device usage and inventory, VECTOR contains an on-line check-in/check-out feature. This feature allows for the identification of devices that are being distributed and those that remain unused. VECTOR also has a similar function for batch tag assignment.

3.2.13 Entry of Raw Inventory Cards

Initial Entry

Upon receipt by the TSC from the manufacturer, raw inventory cards are logged (by batch number, box, and date), into VECTOR.

Batch/Box Number

The VECTOR box number is formatted to include both the batch number and the box number.

Rejects

Raw cards, with a manufacturer number that cannot be read, are handled as manufacturer rejects.

Target Device Connectivity

Cards can be entered into the system by electronically reading the barcode.

Card Entry Order

Card order is important. At the TSC, many of the procedures, related to card inventory, require that the cards remain in the order in which they were logged into VECTOR. If the order of the cards is changed accidentally (after entry), then the cards must be re-processed into VECTOR.

Card Serial Number

Raw Inventory cards are serialized at a POI device located in the TSC. The POI reads the card for both the manufacturer number and the serial number. For raw cards, the serial number will not be present yet. The POI device generates a serial number made up of the unique POI ID prepended to a number representing seconds after a certain date in the past. This unique serial number is then written to the card.

Card Type

When the card is serialized, the card type is set to one of the following:

- Regular
- Agency Employee
- Senior/Disabled

4. Transaction Processing Management Subsystem

4.1 Overview

The key functions of the Transaction Processing Management Subsystem (TPMS) are summarized below and illustrated in Figure 2. The following discussions in this section provide more detailed TPMS information. Topics covered are separated by the types of data, either device status or transactions, being handled.

- **Device Status Generation** includes the transmittal of the list of valid Home customer devices to Away Agencies, transmittal of a combined list of valid devices (including both Home and Away Agencies devices) to Home Agency lanes, and transmittal of the combined list to external lanes managed by other firms (such as associated Non-Toll Agencies).
- **Transaction processing** consists of validating transactions received from all sources, obtaining customer account information and status, matching entry and exit transactions for closed-loop systems (such as toll roads), and interfacing with the Violation Enforcement Management System (VEMS) to forward violation transactions for VEMS processing.
- **Transaction Posting** consists of those steps to determine the least toll to charge the customer (accounting for the customer's various discount plans) and interfacing with the Customer Account Management System to post valid tolls to Home customer accounts. Additionally, transactions of Away customers that were identified during Transaction Processing or VEMS processing are forwarded to the appropriate Away Agency for posting to Away customer's accounts.
- **Reconciliation** consists of matching original transactions received from different sources to those that are posted to customer accounts. VECTOR reconciles both internal and external sources of transactions. External reconciliation employs specific reconciliation interface files exchanged with the external agencies.

Transaction Processing Management Subsystem (TPMS) Data Flow

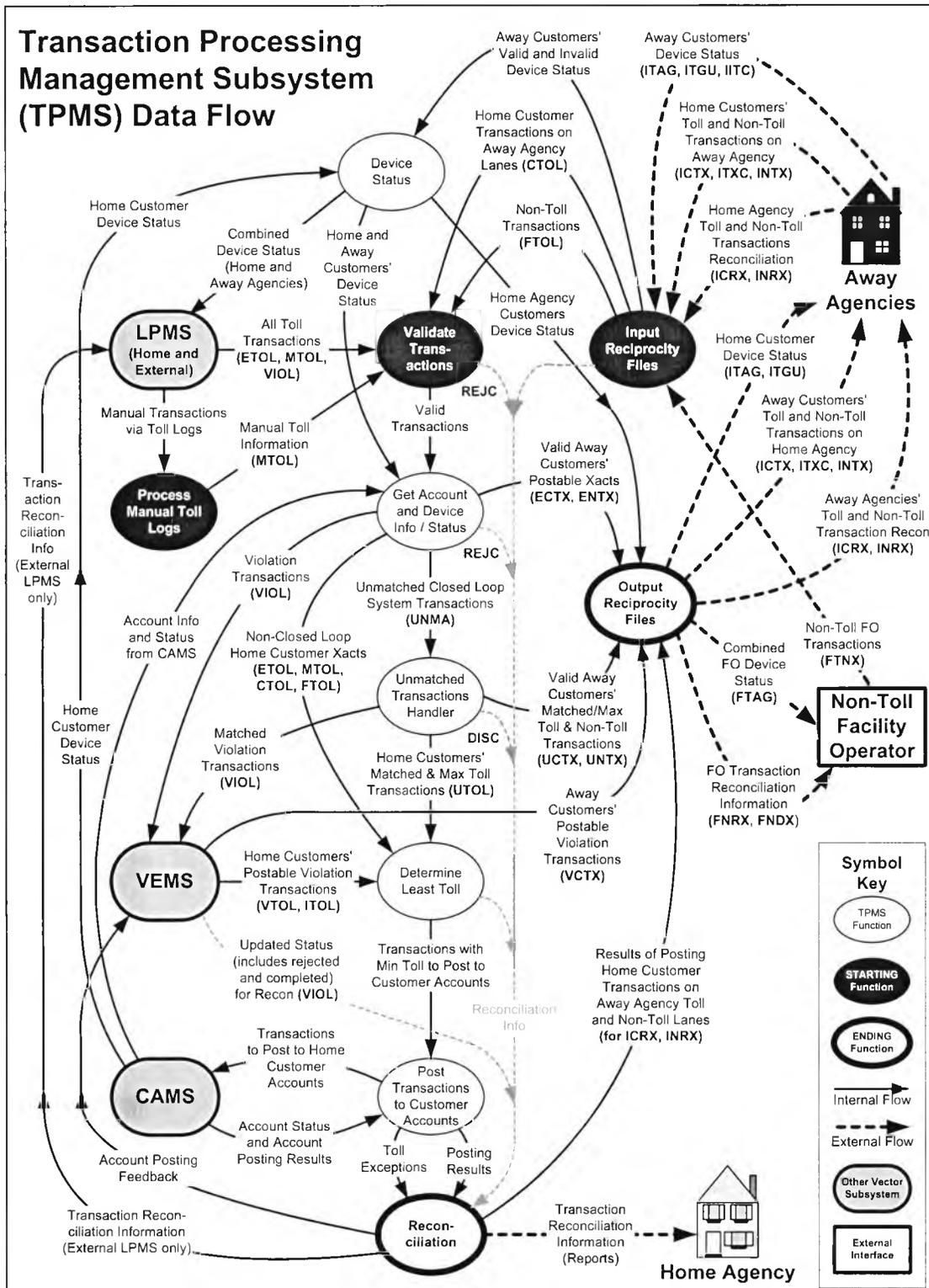


Figure 2 TPMS Data Flows

NOTE: See Appendix C, Section C.8 for explanations of file type acronyms appearing in parentheses.

4.2 Device Status Generation

TPMS receives daily device status information from Away Agencies in a file referred to as an "ITAG" file (see Appendix C, Section C.8 for description). One ITAG file is received from each participating Away Agency. The ITAG file contains the devices and status for the Away Agencies' customers. TPMS also daily prepares information concerning the device status of its own home customers.

TPMS combines home customer device status information with Away customer device status received from each participating Away Agency to create an aggregate device status. TPMS then sends the aggregate devices status to its own lanes via the Lane/Plaza Management Subsystem (LPMS). TPMS also sends the aggregate device status information, via a special "FTAG" file, to all associated and Non-Toll Facility Operators (such as parking facilities).

Finally, TPMS sends its home customer device status information via an output reciprocity file, also called an "ITAG" file, with copies sent to each participating Away Agency.

4.2.1 Sources and Users of Device Status

4.2.1.1 Home Agency Device Status

VECTOR reviews the customer account and device information for Home Agency customers daily. A combination of account and device status is sent to Home and Away Agency lanes as the Device Status for use in allowing customers to use Home and Away Agency lanes. For example, an invalid device status may be sent if the account balance is fine, but the device has been reported as stolen. As another example, an invalid device status may be sent if the device status is fine (not lost, stolen or returned), but the account balance is below an Agency-set threshold. With an invalid device status, the affected customer would be provided lane feedback indicating their device status is invalid. On lanes equipped with barriers, the barrier would not automatically rise. On lanes without barriers, they would be processed as a violation.

Home customer device status information is then formatted and sent to the Home Agency's LPMS's, both internal and external (external LPMS's are those not part of the VECTOR system, but to which VECTOR interfaces). Each LPMS then forwards the device status files to the lanes they control to permit the various LCMS's to determine the eligibility of an approaching vehicle to pass through their lanes.

If the Home Agency is implementing reciprocity, VECTOR also sends the device status (combination of account and device status) of Home Agency customers to each participating Away Agency to permit home customers to use the lanes of the Away Agencies.

4.2.1.2 Away Customer Device Status

When an Agency agrees to implement reciprocity, they agree to exchange certain types of customer information with the other participating agencies. This information identifies each agency's customers and enables the proper processing of transactions and device status. There are three types of information exchanged between reciprocal agencies: device status (including device identification number and combined account/device status), customer demographics (name and address), and customer vehicle information (make, model, license plate).

VECTOR will combine each Away Agency's customer information (including device status) with its own Home Agency customer information and send the aggregate information to the internal and external LPMS's and lanes it supports.

Home Agency customer information (device status, demographics and customer vehicle information) will be provided to participating Away Agencies, using IAG-specified file formats (such as the full device status "ITAG," incremental device update "ITGU" files, and license plate "ICLP" files described in Appendix C, Section C.8).

Such information exchange with Away Agencies allows Home Agency customers to use Away Agency lanes and for Away Agency customers to use Home Agency lanes, all from a single customer account.

4.2.1.3 Non-Toll Facility Operator Device Status

Non-toll facilities are those not associated with toll roads, bridges or tunnels (such as parking or commercial retail), which have extended the use of their facilities to device-equipped customers of the toll agencies. To support this, VECTOR combines Home and Away Agency customer device status information into a single device status message, tailored for each non-toll facility (the "FTAG" file shown in Figure 2 above and described in Appendix C, Section C.8).

Currently, IAG rules limit this to just the device status of the supporting Home Agency. When the IAG extends reciprocity to non-toll facility Operators, they will receive a true combined device status file with all devices from participating IAG Agencies.

4.2.2 Device Status Files for Lanes

4.2.2.1 Device Status File Types

VECTOR supports the generation and distribution of two different types of device status files: Full and Incremental, based on their contents and intended periodicity of transmittal.

- A **Full** device status files contains information on all devices handled by the VECTOR system (both Home and Away customers), including both valid and invalid devices.
- An **Incremental** device status only includes changes to the status of devices included in the last Full Device Status file, including any new devices. Incremental device status files minimize the information sent, allowing Agencies to update the device status more frequently than the daily Full Status File.

4.2.2.2 Device Status File Information

A device status file contains information needed to control its distribution, tracking and auditing (including error detecting). The file also contains a detail listing of each device in the integrated system, including the following information:

- Agency identification number (identifies Agency issuing the device, since the file contains devices issued by a multitude of agencies)
- Device identification number (unique identifying number for the device)

- Class of the vehicle associated with the device (IAG vehicle class code such as automobile, motorcycle, pickup truck with 3 axles from Appendix C, Section C.1)
- Type of account to which the device is associated (Private, Business, Commercial, Non-Revenue as discussed in Section 2.2.1).
- The device status (combination of physical device and account status).
- Agency Discount Plans associated with the device. Plans modify when a device is considered valid for use based on a specific agency, plaza, time, and day of the week established for the plan. For example, a specific non-revenue plan may be applicable to only a specific agency (i.e., devices without the plan would be invalid on the participating agency, but would be treated as paying customers using the standard plan when used on an Away Agency's lanes).
- Which participating non-toll plan facilities the customer has opted to use with their toll device (such as airport parking).

4.2.2.3 Device Status Affect on Lane Operations

By IAG business rules, the device status of home customers that TPMS sends to participating Away Agencies is limited to only four conditions:

- Valid
- Low Balance
- Zero Balance
- Invalid

Agency business rules are used to combine a device's Physical Status (Active, Lost, Returned, etc. from Appendix C, Section C.5), Account Activation Status (New, Active, Close, Suspended, etc. - Appendix C, Section C.2) and Account Financial Status (Good, Low, Closed Pending from Appendix C, Section C.2), to form one of the four IAG Device Status codes for controlling lane behavior.

Additional business rules may also be included in the determination of a valid device status, such as making the device invalid for customers who have exceeded speed limits in Agency Lanes (speed suspension), or valid if a particular plan (such as non-revenue) is associated with the device regardless of the financial status of the account.

Table 16 illustrates typical combinations employed by Toll Agencies. Each Agency can further customize the generation of device status to fine-tune their financial liability based on customer, account, and device information contained within the VECTOR database.

Table 16 Typical TPMS Device Status and Affect on Non-VECTOR (IAG) Lanes

IAG Device Status	Physical Device Status (Sec C.5)	Speed Suspension in affect	Account Activation Status (Sec C.2)	Account Financial Status (Sec C.2)	Agency Discount Plans Associated with Device	Affect on Lane Operations (example for lanes without barriers)
Valid	ACTIVE	NO	NEW or ACTIVE	GOOD	<ul style="list-style-type: none"> Any plan 	<ul style="list-style-type: none"> Green light (mixed mode lane only), Good message, Free to pass, and Plan-based toll assessed
				- any -	<ul style="list-style-type: none"> At least one revenue plan with CC pay 	
				- any -	<ul style="list-style-type: none"> Non-revenue plan 	
Low Balance	ACTIVE	NO	NEW or ACTIVE	LOW (agency set threshold)	<ul style="list-style-type: none"> At least one revenue plan No CC pay revenue plan No non-rev. plans 	<ul style="list-style-type: none"> Yellow light (mixed mode lane), Caution msg, Free to pass, and Plan-based toll assessed
Zero Balance	ACTIVE	NO	All <u>except</u> NEW or ACTIVE	ZERO (agency set threshold)	<ul style="list-style-type: none"> At least one revenue plan No non-rev plans No revenue plan with CC rebill 	<ul style="list-style-type: none"> Red light
Invalid	Any combination not previously addressed		Any combination not previously addressed			<ul style="list-style-type: none"> Red light (mixed mode lane only), Warning message, Stop to pay manual toll (mixed-mode lane only), Standard toll (no discount), and Capture image

VECTOR sends more detailed device status information to its own VECTOR lanes than the four-category status exchanged between IAG Agencies practicing reciprocity depicted above. VECTOR TPMS includes a physical device status (four states) and account financial status (eight states) as summarized below. These states are then used by the LCMS to control lane behavior when presented with the specific device. Although more flexibility for controlling lane behavior exists for VECTOR Lanes, current clients are configured to mimic the four-category IAG response depicted in Table 16 above. Table 17 below shows the cross-reference between IAG device status and VECTOR Lanes (LCMS) Device and Account Status currently in use.

Table 17 TPMS to Vector Lanes (LCMS) Interface

IAG Interface File Device Status	VECTOR Lanes (LCMS)		VECTOR TPMS Data Category		
	Device Status	Account Status	Device Status	Account Activation Status	Account Financial Status
Valid	Active	Good	ACTIVE	New or Active	GOOD
Low Balance	Active	Low Balance	ACTIVE	New or Active	LOW
Zero Balance	Active	Zero Balance, or Negative Bal	ACTIVE	New or Active	ZERO
Invalid	Active	<i>not</i> Good, Low, Zero or Neg Bal	ACTIVE	<i>not</i> New or Active	<i>any status</i>
	Active	<i>any status</i>	ACTIVE	<i>any status</i>	<i>not</i> Good, Low or Zero
	Lost, Stolen or Inventory	<i>any status</i>	<i>not</i> ACTIVE	<i>any status</i>	<i>any status</i>

VECTOR TPMS also includes in its device status transmittal to its own lanes a code that will trigger a VECTOR lane to collect images each time a specified device is encountered, whether or not a violation has occurred. Another flag setttable by TPMS in a VECTOR lane device status file will cause a VECTOR lane to generate an email notification message when a specified device is encountered. Such functionality allows tracking of specific customer usage in near real time. Use of such functionality is determined by each Agency.

4.3 Transaction Processing

Transaction processing consists of receiving transactions, validating transactions and getting customer information for the device used in the transaction. For closed-loop system transactions, an additional step is performed in which entry and exit transactions are matched so that the proper toll can be derived.

4.3.1 Tracking Transactions

TPMS tracks transactions during the processing cycle by their type, based upon where they originate within the processing cycle. Various internal files and external interface files are used to track the processing changes that take place. These files are shown in parentheses in Figure 2 above and described in Appendix C, Section C.8.

4.3.1.1 Regular Transactions

Regular transactions generated by the home LCMS generally only have two states: unreconciled and reconciled. When a regular transaction is brought into the system, VECTOR determines the status of the device and the customer account. If both of these are good, VECTOR will post the transaction to the account and mark it as reconciled. If either of these statuses is bad, the system will send the transaction to VEMS and record that it did so.

4.3.1.2 Reciprocal Transactions

A transaction involving a reciprocal Agency is handled in a fashion similar to the regular transaction noted above. The only additional step is the communication with the Away Agency. If the transaction involves a home customer on an Away Agency facility, the transaction is posted and the reconciliation information is sent to the Away Agency as well as being recorded in VECTOR. If the transaction involves an away customer on a home facility, VECTOR will send the information to the Away Agency for posting. After it sends the transaction, it marks its status as waiting. When the reconciliation information is received from the Away Agency, VECTOR will update the transaction information and change its status to reconciled.

The IAG spec requires that the receiving agency post or reject all transactions. Transactions that cannot be posted have various reject codes depending on the reason for the reject. One of the reject codes is NPST. This code means that the tag and account were valid when the tag file (ITAG) was produced and sent to the away agency. Based on this valid status in the ITAG the away agency allows the tag holder valid passage through their lanes (as opposed to considering them a violator/toll evader) and hence expects revenue from the tag holder home agency.

However when the home agency receives this transaction in an ICTX the account/tag could be in an invalid status. Therefore, this transaction cannot be posted. Per the IAG agreement and spec this transaction while not posted on the home account needs to be coded NPST in the recon file (ICRX) with the dollar amount that would have been posted (rather than zero when a transaction is rejected for other reasons). This also signifies that while the transaction was not posted, the home agency needs to transfer funds for this NPST transaction to the away agency that incurred the transaction.

4.3.1.3 Violation Transactions

Violation transactions are handled differently in that they can go through multiple states as they are processed by TPMS and VEMS. The number of states is dependent upon many factors such as the type of violation and who committed the violation. Regardless of the number of states that the transaction goes through, VECTOR will continually update and track the progress as it is processed.

4.3.1.4 Duplicate Transactions

The LCMS or external lanes can create duplicate transactions erroneously, should the hardware detect the same device twice. If a transaction for a given device at a specific plaza and lane is within five minutes (generally, although this time assignment is Agency specific) of another transaction at the same plaza and lane, then a duplicate is recognized by TPMS. VECTOR TPMS identifies duplicate transactions and discards the second transaction as a duplicate. TPMS will still reconcile both transactions, however, so that all transactions received can be accounted for, but the customer will only be billed for the first transaction.

4.3.2 Sources of Transactions

As shown in Figure 2, Transactions may be received from one of four different sources: VECTOR Lanes (via the LPMS), Manual Toll Logs, Away Toll Agencies and associated Non-Toll Facility Operators.

- Regular and violation transactions from Home Agency lane transactions (via LPMS)(created by both Home and Away customers)
- Regular transactions from manual toll logs (both Home and Away customers)
- Reciprocal toll transactions from home customer transactions on Away Toll Agencies (via IAG interface files)
- Non-toll transactions by home and away customers from non-toll facilities associated with the Home Agency.

4.3.2.1 Home Agency Lane Transactions (LPMS)

Home Agency transactions refer to any transaction that comes in from the Home LCMS, as forwarded from the LPMS. Three different types of toll transaction files are created, based on the transactions received: Electronic Tolls (ETOL's), Manual Tolls (MTOL's) and Violation Tolls (VIOL's).

MTOL's, ETOL's, and VIOL's are sent from Home Agency lanes (with or without a VECTOR LCMS/LPMS configuration). Transaction transfer can be set up to occur periodically (such as once per day) or whenever transactions occur (in near real-time with batch sending as a backup when communications is lost).

Transactions in Home Agency lanes may be by Home Agency customers, Away Agencies customers and non-customers. Non-customers are those without a device (so that no customer information is obtained) or for whom an account could not be found (such as a violator without a device). MTOLs, by their nature, are not associated with a customer, since cash or tokens are used as payment.

4.3.2.2 Away Customer Transactions on Home Agency Lanes

If a reciprocity agreement is in place, customers of other Away Agencies can use the toll plaza and lane facilities of the Home Agency running VECTOR. VECTOR processes these transactions (ETOL, MTOL and VTOL) in the same manner that it processes the home customers, but instead of posting the transactions to a home customer account (since the accounts do not exist on VECTOR for these devices), they are sent to the Away Agency for payment using an IAG reciprocity file (ICTX as described in Appendix C, Section C.8). ICTX generation is conducted following account posting and reconciliation, which are discussed later in this section.

It is important to note, however, that any violation transactions made by Away customers on Home Agency lanes are sent to the Home Agency VECTOR VEMS for processing, not to the Away Agency. Current IAG rules require each agency to process its own violations.

4.3.2.3 Violation Transactions on Home Agency Lanes

Transactions are identified as violations for three main reasons: no device number, bad account status, or a lane violation as summarized in Table 18 below.

Table 18 Typical Violations and Causes

Violation	Cause
No Device Number	Device or lane hardware malfunction or a vehicle using the lane without a device.
Bad Account Status	Insufficient balance, closed account, or some other reason.
Lane Violation	Customer exceeded the speed threshold of the lane, poached (traveled close to another customer such that only one device, but multiple vehicles are sensed), or used a device coded for one vehicle type/class in a vehicle with a different type/class.

There are times when a transaction is received from an LCMS (via its LPMS) without a device ID. This can be a result of a device or lane hardware malfunction or a vehicle using the lane without a device.

Transactions made by a customer with a bad account status will also be marked as a violation. This can be a result of an insufficient balance, closed account, or some other reason.

The last category of violation is one where the LCMS identifies the transaction as a lane violation. These are situations where the customer exceeded the speed threshold of the lane, poached (followed another vehicle closely so as to use their device read to pay for both of them), or used a device for one vehicle type in another. In all these cases, the transaction will be sent to VEMS for further processing (see section VEMS). VEMS will update the status to indicate its processing progress. For a list of violation statuses, refer to Appendix C, Section C.6.

4.3.2.4 Manual Toll Logs

When a device is not properly read at the lane, a lane violation transaction is generated. The customer may not even be aware that a violation occurred. On lane implementations with barriers (i.e., gates), this is not the case. If the lane does not read the device (or it is not valid), the barrier will not be removed and the motorist will not be able to continue.

These types of lanes often have personnel who respond to this event and capture motorist and vehicle information in a paper log. If the driver is a customer (identified by test reading the device on a local reader in the lane or by using a bar code reader on the device's bar code), the toll plaza personnel will collect the information in the lane and pass the information to the CSC. The data will be manually entered which will process it as if it was any other lane transaction.

4.3.2.5 Home Customer Transactions on Away Agencies' Lanes

When Home Agency customers use the lanes of an Away Agency that supports reciprocity, that Away Agency must send an interface file to the Home Agency detailing the transactions of the Home Agency/CSC customers (ICTX File from Appendix C, Section C.8).

In addition to a normal transaction file, an Away Agency can send a transaction correction file (ITXC) to replace a previously sent transaction file (ICTX) to correct its errors.

The Home Agency/CSC receives a transaction interface file from each Away Agency participating in reciprocity in which any of its customers conducted a transaction.

When each ICTX or ITXC file is received, TPMS first validates the file and acknowledges receipt with the other agency. TPMS then converts the data in the file into a standard internal file format, called a "CTOL" or "Casual Toll" file, to reflect the casual use of the other agency's lanes by Home Agency Customers. Such coding enables TPMS to track the transactions through the processing cycle, including when they are posted.

4.3.2.6 Home and Away Customer Transactions on Associated Non-Toll Facilities

A VECTOR system can have one or more associated non-toll facilities. By IAG rules, non-toll facilities are associated with a specific Host Agency which is responsible for integrating the operation of the non-toll facility into the integrate (and reciprocal) toll system. Non-toll facilities employ the devices of other agencies.

The VECTOR system supporting the Host Agency (or CSC), receives non-toll transaction files (INTX'S) from each of its associated non-toll facilities (Appendix C, Section C.8). Such transaction files contain transactions made both by its customers, and by customers of those Away Agencies participating in non-toll reciprocity. The Host Agency/CSC daily receives a non-toll transaction interface file (INTX) from each of its associated non-toll facilities.

In addition to a normal non-toll transaction file, an associated non-toll facility can send a correction file (ITXN) to replace a previously sent non-toll transaction file (INTX).

When each non-toll transaction (INTX) or non-toll correction (ITXN) file is received, TPMS first validates the file and acknowledges receipt with the non-toll facility. TPMS then converts the data in the file into a standard internal file format, called a Facility Operator Toll (FTOL) file. Such coding enables TPMS to track the transactions through the processing cycle, including when they are posted.

4.3.3 Validate Transactions

When a transaction file is received from either a VECTOR lane, an Away Agency's interface file (ICTX) or a non-toll facility Operator's interface file (INTX); the data in the file is first validated to ensure the file was received correctly prior to processing the transactions.

Validation checks use information in the header and footer of the files, as well as column definitions and data types to ensure the format of the received file is correct. Files with errors are automatically requested to be resent.

4.3.4 Get Account and Device Information and Status

VECTOR's standard method of associating a customer with their account is by means of an electronic device that is affixed to the vehicle. The LCMS 'reads' the device ID and includes it as part of the transaction. TPMS uses the device ID to retrieve the customer's account information.

If a transaction is identified as belonging to a Home Agency's customer, VECTOR will determine the status of the customer's device and account. If either of these is bad, the transaction will be sent to the VEMS for processing (as a VIOL transaction). Assuming that both the device and the account are in a good status, VECTOR will determine if the transaction is flagged as a lane violation (a vehicle class mismatch). Flagged transactions are sent to the VEMS (as part of the "VIOL" transaction file) for violations processing.

Transactions with insufficient information to identify the customer as either a home or away customer will be rejected for further processing (REJC transactions). As in transaction validation, VECTOR stores these rejected transactions for reconciliation and reporting purposes.

Transactions with good devices and accounts, and have not been flagged as violations, continue on to be posted. If the transaction is from a closed-loop system, it will be routed through the Unmatched Handler prior to posting.

4.3.5 Unmatched Transactions Handler (Closed-Loop System Transactions only)

On closed-loop toll systems, there will be a pair of transactions that will be associated to form the entry and exit set. VECTOR uses its Unmatched Handler to associate the two transactions before calculating the appropriate toll rate based on where the customer entered and exited the closed-loop toll system.

Unmatched transactions (those transactions lacking either an entry or exit event) are sent to TPMS on a regular basis. This can occur due to any of the reasons mentioned above where the device is not read. It can also occur if the separation time between entry and exit is greater than a predefined amount of time (vehicle breakdown for instance) or the entry and exit transaction might happen on two subsequent days.

Entry and exit transactions are included in an internal file ("UNMA" of Appendix C, Section C.8) sent to the Unmatched Handler. The Unmatched Handler will match the entry/exit pair and pass them on for posting. Entry or exit transactions that cannot be matched are checked against Agency business rules to determine if a transaction can be still completed. For example, an exit transaction

without a corresponding entry could be assessed a maximum toll assuming travel from the first entry point on the closed-loop system. Entry or exit transactions that cannot be used to complete a transaction are discarded ("DISC" transactions). Discarded transactions are saved and used in reconciliation to account for all transactions received.

VECTOR TPMS will store unmatched transactions for a set amount of time to see if the other is received. If the second part of the transaction set is received within a pre-defined period of time (set by Agency), then the pair will be processed normally. If it does not, TPMS will process these transactions based upon the predefined rules of the Agency. Typically, a predefined maximum toll rate is assessed or the amount that would normally be charged between the received transaction lane and the farthest point in the toll system is assessed.

Home customer matched, or Agency corrected (such as Max Toll), transactions are sent for posting to home customer accounts ("UTOL" file of Appendix C, Section C.8). Away Customers' matched or max toll transactions are sent (in a "UCTX" file) to be merged with other Away customer transactions into external transaction interface files (ICTX) for transmittal to the appropriate Away Agency)

Closed-loop system violation transactions of Home and Away customers, once matched, are routed to the VECTOR VEMS for processing as a violation. As previously stated, IAG rules require each Agency to process all violations (both Home and Away customers) that occur on their facilities.

4.4 Transaction Posting (Home Customers Only)

As shown in Figure 2, transactions for posting to Home Agency customer accounts originate from any of the sources summarized below:

- Home customer transactions on Home Agency lanes (from LCMS via LPMS) for open-loop systems (ETOL's and MTOL's),
- Home customer transactions on Home Agency lanes for closed-loop systems after matching entry and exit transactions or using Agency business rules to create a complete transaction (UTOL's),
- Home customer violations on Home Agency lanes forwarded from VEMS for posting with or without an image review (ITOL's and VTOL's respectively) based on Agency business rules,
- Home customer transactions on Away Toll Agency lanes (CTOL's),
- Home customer transactions on associated non-toll facilities where the Home Agency is also the Host Agency for the non-toll facility.
- Home customer transactions on Away Agency associated non-toll facilities (FTOL's), when non-toll reciprocity is implemented.

Prior to posting a transaction to a Home customer's account, VECTOR first computes the least amount to charge for the transaction, based upon Agency business rules such as discount plans, toll schedules, holiday and congestion pricing. After determining the best toll rate to charge the customer, VECTOR will post the transaction to the customer's account.

If the plan type charged against was prepaid, the amount of the toll will be immediately subtracted from the account balance. If the rate was based on a post-paid plan, the toll will be added to the other transactions on that plan and billed according to the periodic billing nature of the plan.

4.4.1 Determining Least Toll

The different types of plans that are available in VECTOR are described in the Section 2.1.3. During toll charge calculation, the system will look at all the plans associated with the device listed in the transaction and determine the lowest rate to charge the customer. VECTOR uses this least toll to override the toll reported from the lane.

For example, a customer who possesses both a standard and commuter plan may use a toll facility that is not included in the commuter plan. In this instance, VECTOR will look at the plans and assess the standard plan rate. Later, that same customer may use a facility that is in the commuter plan. For that transaction, the system will calculate the rate based on the commuter plan. Should the customer have two different commuter plans, each containing the facility used, VECTOR will charge the lower of the two plan rates (as long as all other aspects of the two plans also are met).

VECTOR will also ensure that all trip-based plans associated with the device listed in the transaction will be credited with the trip. For example, if in the previous example both plans had a minimum number of trips to complete per month, VECTOR would credit a trip to each plan.

4.4.2 Fee Rate Schedules

VECTOR provides the ability to have multiple fee rate schedules for the same facility (lane), giving Agencies flexibility in determining the amount to charge a customer to use the facility.

VECTOR is able to maintain toll schedules that handle each of the different IAG vehicle classes on a nearly unlimited number of toll plazas. This includes fee rate schedules not only for fixed barrier plazas, but also closed-loop system entry/exit facilities.

Fee rate schedules are created by SAMS. The LPMS retrieves the applicable fee rate schedules and distributes them to the applicable lane(s) (LCMS') that it controls.

Two different types of fee rate schedules are available in VECTOR: standard and variable/congestion pricing.

4.4.2.1 Standard Pricing Fee Rate Schedule

Standard pricing refers to the default toll schedule to be used when determining the amount to charge a customer. This may be the only toll schedule that the Agency provides for a given facility or set of facilities. Standard pricing typically depends only on the class of vehicle (such as trucks being charged more than automobiles).

4.4.2.2 Variable and Congestion Pricing Fee Rate Schedule

Variable pricing allows agencies to vary fee rate schedules by the week, day, or hour of the day. It may also provide a different schedule for designated holidays during the year.

Congestion pricing (a form of variable pricing) allows agencies to increase the toll amount at certain high traffic volume times of the day to encourage drivers to commute at different times of the day, thereby reducing the amount of rush-hour traffic.

4.5 Reconciliation

Reconciliation is the process of matching transactions posted to accounts (or rejected/discarded) against transactions received. Reconciliation is conducted both for system control purposes (to ensure all transactions are accounted for) and for financial settlement purposes (to determine funds to be transferred between reciprocal Agencies).

Reconciliations conducted by VECTOR fall into three broad categories: Internal, Toll Reciprocity and Non-Toll Operations (including Non-Toll Reciprocity). The reconciliations conducted within these categories by VECTOR are summarized below.

INTERNAL

- Transactions (ETOL's, MTOL's, VIOL's) recorded on Home Agency lanes are reconciled against those posted to Home Agency customer accounts.

TOLL RECIPROCITY

- Transactions recorded on Home Agency lanes are reconciled against those posted to Away Agency customer accounts. Transmittal of transactions to the participating Away Agency and receipt of reconciliation information from the Away Agency are governed by IAG toll-based reciprocity business rules and interface files.
- Transactions recorded on Away Agency lanes by Home Agency customers are reconciled against those posted to Home Agency customer accounts. Receipt of transactions from the Away Agency and transmittal of reconciliation information to the Away Agency are governed by IAG toll-based reciprocity business rules and interface files.

NON-TOLL OPERATIONS

- Transactions recorded on Home Agency associated non-toll facilities (where the Home Agency is also the Host Agency) are reconciled against those posted to Home Agency customer accounts. Receipt of transactions and feedback to the non-toll facility are governed by IAG business rules and interface files for non-toll operations.
- Transactions recorded on Home Agency associated non-toll facilities (where the Home Agency is also the Host Agency) are reconciled against those posted to Away Agency customer accounts (once non-toll reciprocity is implemented by the IAG). Transmittal of non-toll transactions to Away Agencies and receipt of reconciliation information are governed by IAG business rules and interface files.

For actual processing, VECTOR merges the processing for the above categories and specific reconciliations into a single, three-step process: Insertion, matching and reporting.

4.5.1 Reconciliation Process

4.5.1.1 Insertion

All incoming transactions, regardless of source, including both toll and non-toll transactions, are first stored in a single location. Information is included with each transaction during insertion, such as transaction type and originating file, which enables VECTOR to trace transactions back to their

source and to track the changes in status of the transaction during the processing and reconciliation process.

Associated with each transaction in this central storage is a reconciliation state, "reconciled" or "unreconciled." On initial insertion into the central storage, a transaction's initial state is set to "unreconciled."

Sources of transaction files inserted into the central reconciliation storage during the insertion step are listed below (see Appendix C, Section C.8 for descriptions of each type):

Source Transaction Files for Insertion

- Electronic transactions from Home Agency lanes (ETOL's)
- Manual transactions from Home Agency lanes (MTOL's)
- Violation transactions from all sources (VIOL's)
- Electronic transactions from Away Agency lanes (CTOL's)
- Electronic non-toll transactions from Host or Away Agency non-toll facilities (FTOL's)

4.5.1.2 Matching

Transactions that are posted or rejected (including REJC's, DISC's and status changes to VIOL's) are matched to unreconciled transactions in the reconciliation store. When a match is found, the transaction's status is altered to reflect its reconciled state.

For transactions posted to Home or Away customer accounts, the reconciliation state for the affected transaction in the reconciliation store is changed to "reconciled." Rejected transactions remain in an "unreconciled" state.

VECTOR also stores additional information for reconciliation tracking with the transaction as part of the matching process. For example, VECTOR also saves the posted amount and the source of the posting (such as the specific Away Agency reconciliation file, ICRX, that indicated the transaction had been posted to an Away customer's account). As another example, the source of the rejection and reason for rejection are recorded.

4.5.1.3 Reporting

Once insertion and matching are complete for a given day, various VECTOR reports are run against the central reconciliation store to display the results of posting. Post-reconciliation reports indicate the status of reconciliation for all transactions received, the amount of funds to be transferred to Away Agencies following posting of Home Agency customer transactions on their facilities, funds to be received from Away Agencies, problem transactions in the posting and reconciliation process, etc.

4.5.2 Toll Reciprocity Reconciliation

Reciprocity reconciliation checks the central reconciliation transaction store against the external sources or receivers of transactions to provide them required status updates following posting/rejection. VECTOR supports two similar, but different, external reciprocity interfaces: Toll Reciprocity and Non-Toll Reciprocity. Both are governed by IAG rules, standards and interface file formats.

Toll Reciprocity reconciliation uses the IAG-approved interface files shown in Appendix C, Section C.8. Two different processing sequences are managed by VECTOR: Home customer transactions on Away Agency lanes and Away customer transactions on Home Agency lanes.

VECTOR provides reports that summarize the posting status as related to Away Agency transaction files to enable the Home Agency / CSC to manage the interaction with Away Agencies. The reconciliation report, which summarizes the reconciliation file, shows the total amount due to each Away Agency as a result of successful postings (or rejections) to Home customer accounts. The transfer of funds between agencies indicated by the report is handled manually, outside of VECTOR following IAG business rules.

Other VECTOR Reports allow users to check the progress of posting, either against the totality of Away customer transactions in the reconciliation store or against individual ICTX (or ITXC) files sent to the Away Agency.

4.5.2.1 Home Customer Toll Transactions on Away Agency Lanes

VECTOR receives transactions by Home Agency customers on Away Agency lanes via an IAG interface transaction file (ICTX) sent from each Away Agency with Home Agency customer transactions (see Appendix C, Section C.8). VECTOR stores the transactions contained in the ICTX file as CTOL's, which go through the normal transaction processing and posting processes previously discussed.

As part of reconciliation, however, VECTOR also must create reconciliation files for transmittal back to the Away Agencies that were the source of the transactions to inform those Agencies of transactions which were posted or rejected to Home Agency customer accounts. VECTOR uses the information in the reconciliation store regarding posting status to create one transaction reconciliation file (ICRX) for each ICTX file previously received from each Away Agency that contained transactions that completed processing (ICRX files are directly linked to one and only one ICTX file). Since several days may pass before all transactions in a given ICTX file are handled (posted or rejected), VECTOR daily prepares multiple ICRX files for each Away Agency.

An Away Agency may also send a transaction correction file (ITXC) to the Home Agency (and VECTOR) to correct transactions previously sent in an ICTX file. To support this, VECTOR will generate one or more transaction correction reconciliation files (IRXC's) in a similar fashion to the ICRX file previously discussed.

VECTOR will reconcile the transactions in the ICRX (or IRXC) against the originating ICTX (or ITXC) file by updating the reconciliation state for associated CTOL transactions previously inserted into the reconciliation store to show that they have been posted by the Away Agency. The ICRX (or

IRXC) file identifier will be included with the transaction update to record the source of posting with the transaction.

4.5.2.2 Away Customer Toll Transactions on Home Agency Lanes

Toll transactions for Away customers that used Home Agency lanes are sent to the applicable Away Agency in an ICTX file (or a transaction correction ITCX file), one ICTX file for each Agency whose customers used the Home Agency lanes. Once an Away Agency posts/rejects the transactions to the customer accounts they maintain, the posting Agency will send a transaction reconciliation file (ICRX) back to the Home Agency. The posting Agency will send one ICRX file for each previously received Home Agency ICTX that will contain the transactions that were posted or rejected by the Away Agency that day.

VECTOR will use the reconciliation (ICRX) files received from Away Agencies in a fashion similar to that previously described for internal reconciliation. Transactions in an ICRX file are matched to those transactions in the reconciliation store, and the matched transactions status and information are updated to reflect the status reported in the ICRX file. As with internal reconciliation, ICRX transactions not matched are copied to an error file for manual review and intervention.

Should an error be made in an ITCX file sent by the Home Agency (VECTOR) to an Away Agency, VECTOR will generate a transaction correction file (ICXC) in a fashion similar to that for the ITCX file. In return, the Away Agency will send one or more transaction correction reconciliation files (IRXC's). VECTOR will employ IRXC's in a fashion similar to that for normal transaction reconciliation files (ICRX's) to update the reconciliation status for affected transactions in the reconciliation store.

4.5.3 Non-Toll Reconciliation

Each non-toll facility is associated with a Host Agency. The Host Agency provides the interface into the greater, integrated toll system. VECTOR supports the IAG Facility Operator interface files to enable the communications between the Host Agency and its associated Facility Operators.

Without non-toll reciprocity (separate from toll-based reciprocity), transactions on non-toll facilities may only be posted to accounts maintained by the Host Agency (Host Agency's VECTOR). Away Agency customers desiring to make use of the Host Agency's non-toll facilities must establish a companion account with the Host Agency and provide the Host Agency with their device number (see Section 2.2.1 for a description of a companion account).

With non-toll reciprocity, Away Agency customers may elect to employ another Agency's non-toll facilities without the need for a companion account. Non-Toll reciprocity uses the IAG-approved Facility Operator interface files shown in Appendix C, Section C.8.

Three different non-toll reconciliations are managed by VECTOR:

- Host Agency to Facility Operator reconciliation
- Host/Home Agency non-toll transactions by Away Agency customers
- Away Agency non-toll transactions by Host/Home Agency customers

4.5.3.1 Host Agency to Facility Operator Reconciliation

Once a day, each non-toll facility associated with a Host Agency prepares and sends to the Host Agency a Facility Operator Transaction File (FNTX) that contains the transactions recorded at the facility for the day. If non-toll reciprocity is not implemented, the file only will contain transactions for Host Agency customers and those Away Agency customers who have established companion accounts with the Host Agency. With non-toll reciprocity, the FNTX file will contain transactions for both Host and Away Agency customers.

VECTOR receives and processes the FNTX files from each associated non-toll facility in a manner similar to that for toll-based reciprocity transaction files with an Away Agency (the ICTX file previously discussed). FNTX transactions are converted to FTOL's (instead of CTOL's) and sent through the normal processing.

VECTOR will daily create a Facility Operator reconciliation file (FNRX) that will contain all transactions posted to customer account (including companion accounts) each day from the corresponding non-toll transaction file (FNTX). VECTOR will generate one or more FNRX files for each FNTX file received -- one for each day transactions from the FNTX file are posted until all transactions are posted or rejected.

Facility Operators may also send an FO Correction file (FTXN) to correct transactions previously submitted in an FNTX file. VECTOR will process the correction file in a similar manner to a non-toll transaction file (FNTX) and generate one or more FO Correction Reconciliation files (FRXN's) until each transaction in the FTXN has been posted or rejected.

Different than toll-based reciprocity, non-toll operations include the use of a distribution file. VECTOR daily sends to each associated Facility Operator an FO Distribution file (FNDX) that provides information as to the distribution of the transactions contained in the submitted FO transaction or correction file (FNTX or FTXN). The distribution file will list all transactions the Host Agency processed, including those redirected to Away Agencies for posting. Transactions will be annotated in the FNDX with the agency code of the Agency to which they were directed for posting.

4.5.3.2 Host/Home Agency Customer transactions on Away Agency Non-Toll Facilities

With non-toll reciprocity, each Away Agency will transmit to the Host/Home Agency a daily non-toll transaction file (INTX). The INTX will list all non-toll transactions conducted by Host/Home Agency customers on the non-toll facilities associated with the Away Agency ready for posting.

VECTOR will receive and process the INTX file in a manner similar to that used for a Facility Operator transaction file (FNTX). As with the FNTX, VECTOR will validate the file, load the transactions as FTOL's, and send them through the transaction processing previously discussed.

During the reconciliation process, a non-toll reconciliation file (INRX) will be prepared in a similar manner to that of the FO reconciliation file previously discussed to show all transactions posted or rejected from the original INTX file received. As with all reconciliation interface files, VECTOR will generate one or more INRX's until all transactions in their parent non-toll transaction file (INTX) have been posted or rejected.

As with the FO reconciliation correction file, should VECTOR need to correct a non-toll reconciliation file (INRX) sent to an Away Agency, it will generate a non-toll correction reconciliation file (IRXN) for that Away Agency.

It should be noted that, while IAG business rules include provisions for a Facility Operator to send corrected non-toll FO transactions files (to allow them to resubmit transactions when they fail to post due to bad credit cards), no such provisions exist for inter-Agency non-toll reciprocity.

4.5.3.3 Away Agency Customer Transactions on Host/Home Agency Non-Toll Facilities

After processing the non-toll Facility Operator transaction files (FNTX) as previously discussed, VECTOR's include both Host/Home and Away customer non-toll transactions in its reconciliation store.

In a manner similar to that used for toll-based reciprocity, VECTOR will identify the Away Agencies responsible for the non-toll transactions and prepare non-toll transaction files (INTX's) for each responsible Agency.

An Away Agency receiving a Host/Home Agency INTX will daily return a non-toll reconciliation file (INRX) back to the Host/Home Agency (VECTOR), detailing the transactions in their INTX that were posted or rejected that day. VECTOR will reconcile the INRX files received each day against the source of the transactions in this case, the FTOL's received from its associated Facility Operator via a non-toll FO transaction file (FNTX).

Away Agencies may also send a correction to a previously transmitted non-toll reconciliation file (IRXN). VECTOR shall process this file in a manner similar to that used for a normal non-toll reconciliation file.

VECTOR will include all reconciled non-toll transactions (i.e., those posted by any/all Away Agencies) in the FO reconciliation file (FNRX) that it daily sends to each of its associated non-toll Facility Operators as previously discussed.

4.6 Output Reciprocity Files

VECTOR sorts the transaction information contained in the reconciliation store to generate the various IAG interface files previously discussed. Following file generation, VECTOR transmits each file to the appropriate Away Agency via FTP.

Each file received and validated by an Away Agency is acknowledged back to the Home Agency VECTOR system using an IAG Acknowledgement file. The acknowledgement file indicates whether the file was successfully received and validated. If VECTOR does not receive an ACK file within a specified time period, or receives an ACK file that indicates an error in transmission has occurred, VECTOR will automatically resend the affected output reciprocity files.

5. Financial Processing Management Subsystem

5.1 Overview

The key functions of the Financial Processing Management Subsystem (FPMS) are as follows:

One-Time payment processing consists of VECTOR accepting payments made with cash, check, or credit card once

Recurring Payment Processing is the process through which an Agency's customers who pay by credit card are automatically re-billed when their accounts reach a predetermined threshold amount. This process takes place in three basic phases: Request for Authorization, Response, and Settlement.

CSR financial reconciliation consists of the verification of the CSR deposit by the supervisor during closeout.

ACH Debit Processing allows for the customer to pay their bill through ACS debit utilizing their bank routing and account number.

5.2 One-Time Payment Processing

Whenever a customer's account balance falls below \$10, by default, the account is marked for replenishment. Periodically (usually once a night), the system goes through the accounts and collects all those that need to be replenished and puts the necessary information (credit card number, expiration date, name, address, number of replenishment attempts) into a file. If the number of replenishment attempts is greater than two (customizable) the customer is converted to a cash customer and a notice is sent out. Otherwise, the replenishment request file is sent to the bank. The bank then sends back a replenishment authorization file. VECTOR goes through this file and updates the customer's balances by the replenishment amount for all that were approved. The approved customer's information is then put into a replenishment settlement file that is sent to the bank. This ends their replenishment process. For customers whose replenishment request was denied, they are put back into the system as needing replenishment and the number of replenishment attempts is incremented.



5.2.1 Automatic Account Replenishment

VECTOR periodically examines credit card customer accounts and identifies those with balances that have fallen below their preset threshold amount. Credit Card and replenishment information for these accounts are gathered and sent to a financial institution for payment processing. Each agency's customers will be processed separately.

When a credit card customers' account reaches a threshold amount, a request is generated in the database for a predetermined replenishment amount. The request for authorization job then creates authorization files of all the requests. These files contain account information including the credit card number and the replenishment amount. There will be a file generated for each agency, based on the agency the account was associated with.

Payment can also set up through ACH debit using the customers bank routing and account number.

5.2.2 Response

The CC Replenishment process sends (via FTP) the request for authorization files to the credit card process or financial institution for approval. A response file is created for each authorization file, one for each agency. The response file contains the same information as the authorization file along with a flag for each request indicating whether the requested Replenishment is approved or declined. The CC Replenishment process then retrieves (FTP) the responded files back from the credit card processor or financial institution.

If the replenishment request is approved, then the customer's account will go on to settlement (see next paragraph). However, if the request was declined, VECTOR will attempt to process the request again on the next replenishment cycle. If a credit card is declined on each of the retry attempts (or the credit card has expired), the customer will be converted to a 'cash' customer. They will lose any privileges associated with an automatically replenished account and a follow-up notice will be sent to the customer via the mail house. These customers will also be charged a device deposit (automatic replenishment customers are not required to pay a device deposit while cash customers are) after an Agency-defined amount of time.

5.2.3 Settlement

For accounts that were approved for replenishment, VECTOR updates the customer balance and notifies the credit card processor or financial institution. The credit card processor or financial institution then bills the customer's credit card for the replenishment amount.

The CC Replenishment process creates settlement files based upon the response files. The files contain all of the information in the authorization file for each account, along with a unique authorization code issued by the credit card processor or financial institution. The settlement files are sent back to the credit card processor or financial institution, which receives the settlement file, and bills the credit card appropriately.

5.3 Recurring Payment Processing

Customers can currently make payments by cash, check, or credit card. In addition to accepting payments by credit card, VECTOR also provides the capability to notify customers when their credit cards are about to expire.

5.3.1 Cash Payments

Customer payments made with cash can be accepted at a walk-in service center. The CSR will collect the payment and update the customer's account information. VECTOR will print out a receipt automatically for the customer. At the end of his/her tour, a CSR will reconcile the cash that was collected as described in section 5.4.

5.3.2 Check Payments

Check payments can be sent in via the mail or used at a walk-in service center. Checks are handled just like cash with the added capability to support an automatic check processing machine. If the Agency uses one of these machines, VECTOR will accept the input and automatically update the customer's information, reconcile it and prepare the bank statement for deposit.

5.3.3 Credit Card Payments

Customers may make credit card payments by phone, and at a walk-in service center. VECTOR currently uses an external organization to process credit card payments. A standard two-phase (capture and settlement) method is followed for credit card billing.

5.4 CSR Financial Reconciliation

5.4.1 Tour-of-Duty (TOD)

Each segment of time from login to logout in VECTOR is treated as a tour segment. These tour segments are tied to a TOD, which uniquely identifies the CSR/Toll Collector, calendar day, and CSR/Toll Collector location.

5.4.2 CSR

CSR's financial activities are linked to a TOD. At the end of a TOD, a CSR (both walk-in and mail-in) enters the amount collected detailed by denomination. This information is used to reconcile the financial transactions made during the TOD.

5.4.3 Verification of CSR Deposit

VECTOR will list the deposits made by all of the CSRs. The supervisor can select a deposit by CSC and tour date. By recounting and entering the values, the supervisor will be able to see whether the



counts are the same. If there are discrepancies, the supervisor can adjust the amount to match (to correct data entry mistakes) or investigate the matter further (operationally implemented).

5.4.4 Close Out

Close out is the process of reconciling the financial transactions of the CSR by the Supervisor. VECTOR displays both the reported and verified amounts of all the TODs for the selected CSC location and tour date. The supervisor generates the PDR report for each of the TOD and compares the daily activity in the PDR against the reported amount. If the amounts match, the supervisor then closes the TOD. If there are discrepancies, the supervisor can adjust the amount to match (to correct data entry mistakes) or investigate the matter further (operationally implemented). By closing the TOD, the supervisor is approving the reconciled file. A CSR will not be able to log back into VECTOR if he/she has an unreconciled TOD. This will force the CSR to contact the supervisor for closing out the open TOD for the previous day. The supervisor needs to close the TODs of only those CSRs who have performed financial transactions so that they can login the next day. For other CSRs with no financial transactions, VECTOR will automatically reconcile these TODs and open new ones.

5.4.5 Bank Deposit

This function allows the authorized user to prepare CSR deposits for bank deposit. By selecting the CSC location and the tour date, VECTOR will display the deposits made by the CSRs. If the CSC is managing multiple agencies, VECTOR will automatically split the CSR deposits between the agencies based upon the recorded daily activity. Daily activity includes customer payments for such items as plan sales, device deposits and sales and toll deposits. As these transactions are posted, they are automatically associated with a customer account and home agency. Since VECTOR already has the customer's account and Home Agency information, when the CSR deposit is made it can split the CSR deposits by agency. If there are overages or shortages in revenue amounts to be split between agencies, the designated parent agency (owner of customer account) will absorb the difference. VECTOR will also indicate which deposits have been verified. Unverified deposits cannot be deposited to the bank. The user will move the CSR deposits into bank deposit bags. Each agency will have their own set of bags and will not be mixed with others.

5.4.6 Bank Feedback

VECTOR also provides a mechanism to capture the paper statements received from the bank. By entering the statement information into VECTOR and associating it to the appropriate deposit, VECTOR can reconcile the bank deposits.



6. Violation Enforcement Management Subsystem

6.1 Overview

Vector can process four different types of violations and/or warnings:

- Toll Evasion (TE) (non-payment of toll),
- Class Mismatch (CLMM) (vehicle class of AVI device differs from that sensed in lane),
- Speed Violation (excessive speed in the lane), and
- Lane Exception Warnings (unauthorized use of a restricted-use lane).

As shown in Figure 3, standard violation processing steps, applicable in varying degrees to each violation/warning type, include:

- Recording the violation (including possible image capture),
- Processing the violation (including possible image review),
- Determining identity of violator (customer and non-customer, DMV plate lookup),
- Noticing the violator (including multiple notices and escalation rules),
- Processing payments,
- Handling appeals,
- Issuing Notice of Liabilities (NOLs) for Court Hearings (optional), and
- Referral to Collection Agency (optional)
- Registration Hold Optional

For each violation type, different rules can be established that affect the different processing steps outline above, as specified by each Agency. The discussion, which follows Figure 3, is segmented by violation type to highlight the variation in Agency business rules for the different violation types. In the process, the depth and breadth of the flexibility of VECTOR is illustrated.

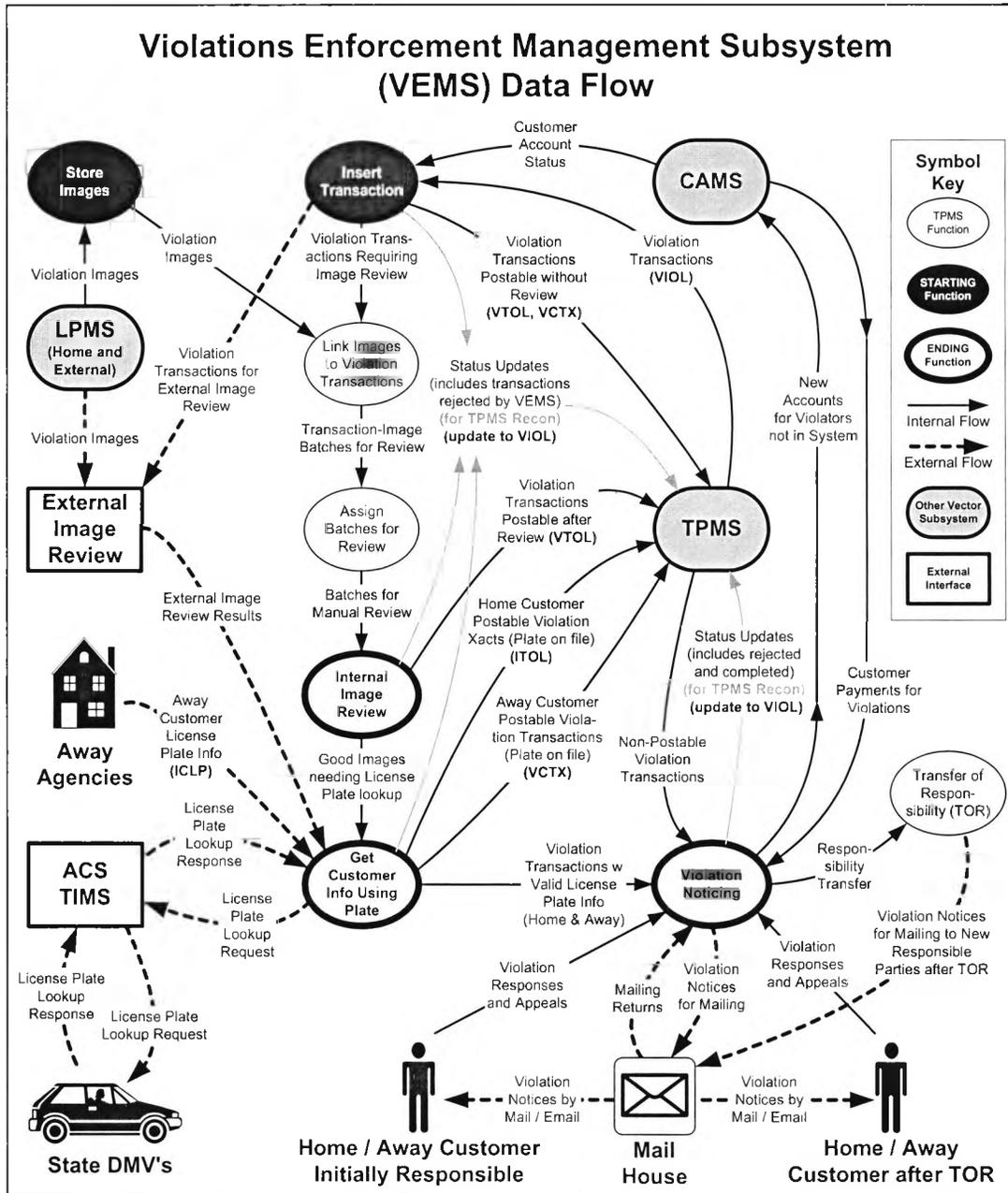


Figure 3 Violation Processing Management Subsystem Data Flow

Note: Description of Acronyms used in parentheses may be found in Appendix C, Section C.8.

As shown in Figure 3, VEMS receives and stores violation images sent from the LPMS that were captured in a lane. Violation transactions for both Home and Away customers are sent to VEMS from TPMS in a VIOL file (see section C.8 for file description).

Based on Agency business rules, some violations may not require image review to resolve. For example, an automobile using a device that was setup for use by a truck would not normally require image review since the toll charge for an automobile is less than that charge for a truck. Transactions not requiring image review could either be from Home or Away customers. Home customer postable violation tolls are forwarded to TPMS for posting as VTOL's while Away customer postable violation tolls are forwarded to TPMS as a VCTX file. TPMS combines the VCTX information with other transactions destined for Away Agencies when it prepares its transaction reciprocity file (ICTX) for that Agency.

For image review, VEMS first matches lane images with the transactions to which they apply. Multiple matched sets of transaction and images are then batched together and then assigned to a CSR for review. VECTOR VEMS provides automated support for the batch assignment function to allow CSC Supervisors to control the workload on individual violations processing CSR's.

Assigned CSR's then conduct the image review, annotating their findings with such items as the license plate number, a revised vehicle class, etc. At this point, violations not requiring license plate lookup to be posted (such as class mismatch) are forwarded to TPMS as a VTOL file for posting.

For violations requiring a license plate to process, VEMS will first attempt to look up the license plate from its database of customers. This database contains customer information for Home Agency customers received from the CAMS and from other Away customers received in an IAG License Plate Interface (ICLP) file from participating Away Agencies.

If the license plate exists in the database (indicating it is for a Home or Away Customer), VEMS will process the transaction as a normal toll, rather than a violation. Transactions for posting to Home customer accounts are passed to TPMS as VTOL's while transactions for posting to Away customer accounts are passed as VCTX files.

If the license plate does not exist within the VEMS database, VEMS will initiate a license plate lookup request with another ACS system external to VECTOR, the TIMS, which then aggregates VECTOR's request with others before it initiates a request with the appropriate State DMV's. Some number of days later, varying depending on the state, VEMS will receive a file back from TIMS with results from its DMV lookups, which may contain the customer and mailing address to which a violation notice may be mailed. Alternatively, the DMV lookup by TIMS may fail, making the violation transaction un-postable due to lack of customer information.

Violation transactions with valid customers are passed to a noticing process for handling the various levels and escalation of violation notices that may be implemented based on each Agency's business rules. Various levels of noticing may be programmed, including referral to court for ticketing -- all based on Agency business rules for the particular type of violation.

As part of noticing, a customer may shift responsibility for the violation to another customer. For example, the device may be in a rental car and the violation notice would first be sent to the rental car company. The rental car company would then ask to redirect the violation noticing to the specific individual who had rented the car when the violation occurred. VECTOR handles such change in responsibility, linking all notices to the violation transaction to which they apply.

For violations without a valid device read and for which a license plate does not exist in the VEMS database (i.e., where the customer's identity cannot be readily confirmed), VEMS will interface with CAMS to establish an account for the new violator customer. This account will be used to record



fees, payments and other transactions as with a normal account to allow retention of history. In return, CAMS will send to VEMS the violation payments it receives from FPMS.

At various points within VEMS processing, the status of a transaction contained within the input VIOL file can change. Changes include rejected (i.e. could not find the customer, or images were not collected and image review was required), to be posted (i.e., included in a VTOL, ITOL or VCTX files), or that it has completed VEMS notice processing. Such status updates are forwarded back to TPMS to allow TPMS to reconcile transactions received (including violations).

TPMS provides feedback to VEMS noticing on the success or failure of posting violation transactions. VEMS uses this information to either escalate noticing, or cancel the violation processing, depending upon the cause of posting failure reported by TPMS.

The following sections are divided by the type of violation, rather than generic process step, to better illustrate VECTOR's capabilities and flexibility by showing the actual context of current operations. It should be noted, however, that VECTOR is capable of implementing all of the diversity of response shown below for any violation as desired by an Agency. For example, the speed violation section does not include image capture, since current Agency business rules do not require it, although VECTOR could be configured to do so, if desired.

6.2 Toll Evasion Violation

A TE violation occurs when a vehicle passes through a dedicated ETC lane or mixed-mode lane without paying the toll. TE violations can only occur at Agencies that do not have barriers at the lanes. If the Agency's lanes have barriers, customers' vehicles are prevented from exiting until the full toll amount has been paid. Non-payment could be due to any of the following reasons:

- Device is in invalid status
- Device belongs to a non-reciprocal agency (that has not supplied a device status file)
- No device read – due to faulty hardware (lane equipment or device), the absence of a device, or an improperly mounted device

TE violators are divided into two groups: Non-customer and customer violators. This distinction is important for violation noticing, occurrence tracking, and other violation processing as discussed below.

6.2.1 Non-Customer Violators

A non-customer toll evasion violator is someone who does not have a valid ETC account and drives through an ETC lane without paying the toll. More specifically, non-customers violators are toll evasion violators that:

- do not have a Home Agency device or account, or whose parent Agency does not provide the Home Agency with a license plate file (ICLP file of Section C.8);
- have a Home Agency account that is closed, closed pending, revoked final, or has been revoked or suspended for violating account-holder terms and conditions (e.g., speeding).
- have an Away Agency account whose device status in the ITAG interface file is listed as Invalid; or
- own a device/account that belongs to a non-reciprocal agency.

On Home Agency facilities, non-customer violators may be subject to NOL, Section 6.2.1.1.

6.2.1.1 Customer Receives Non-Customer Violation

It is possible for a customer to receive a non-customer violation if they drove through a Home Agency lane and either (a) their device was not read or (b) they did not have their device in the vehicle. If the license plate number matches one on file in VECTOR, VEMS will treat the event as a VTOL to be posted to the customer's account rather than as a violation (customer is not charged for violation).

Either situation will result in a violation transaction and images of the license plate will be taken. If the license plate number is identified during image review but does not match a license plate number on the customer's Home Agency account, a non-customer violation notice will be issued.

Possible reasons that a license plate number does not match those on the customer's account include:

- Customer provided incorrect information
- Customer changed license plates without notifying the CSC
- Customer added a vehicle without notifying the CSC
- Clerk at CSC entered the incorrect license plate number

To reduce the possibility of this situation occurring, the CSC encourages customers to maintain the correct vehicle and license plate information on their accounts. The CSC also advises customers to correctly mount the device in their vehicle to ensure that the device will be read.

6.2.2 Customer Violators

A vehicle with a device that is read in the lane will generate a violation transaction when the device status is invalid, lost or stolen. An invalid device status may result from one of the following:

- Device is not assigned to an account – inventory or test device
- Account is in a negative balance status (cash/check customers are considered to be in negative balance status when their balance falls below an Agency-defined threshold. If a credit card replenishment customer's credit card is declined twice, the account is automatically switched to cash/check replenishment and the same cash/check rules would apply to the account.)

Table 19 provides examples of the various combinations of device and account statuses that could result in a violation. The table also indicates which types of transactions could result in violation images being taken and which images might be reviewed. Each Agency would define these business rules.

Table 19 Toll Evasion Device/Account Status

Account Status	Device Status	Speed Suspension?	Account Balance	Image Capture?	Image Review?	Type of Notice	Violation Type
Closed	-	No	N/A	Yes	Yes	Non-Customer	Device Violation
Closed Pending	-	No	Any	Yes	Yes	Non-Customer	Device Violation
Good	Active	No	>Replenishment Threshold	No	No	N/A	N/A
Good	Active	Yes	>Replenishment Threshold	Yes	No	Customer	Customer Violation
Low Balance	Active	No	>Zero Balance Cutoff (-\$14.99 IAG Agencies) and <Replenishment Threshold	No	No	N/A	N/A
Low Balance	Active	No	< Zero Balance Cutoff (-\$14.99 IAG Agencies)	Yes	No	Customer	Negative Balance Violation
Low Balance	Active	Yes	> Zero Balance Cutoff (-\$14.99 IAG Agencies) and <Replenishment Threshold	Yes	No	Customer	Customer Violation
Low Balance	Active	Yes	< Zero Balance Cutoff (-\$14.99 IAG Agencies)	Yes	No	Customer	Customer Violation
Revoked Warning	Active	No	< Zero Balance Cutoff (-\$14.99 IAG Agencies)	Yes	No	Customer	Customer Violation
Revoked Warning	Active	Yes	< Zero Balance Cutoff (-\$14.99 IAG Agencies)	Yes	No	Customer	Customer Violation
Revoked Final	Active	No	< Zero Balance Cutoff (-\$14.99 IAG Agencies)	Yes	Yes	Non-Customer	Device Violation
N/A	Retained	N/A	N/A	Yes	Yes	Non-Customer	Device Violation
N/A	Defective	N/A	N/A	Yes	Yes	Non-Customer	Device Violation
N/A	Inventory	N/A	N/A	Yes	Yes	Non-Customer	Device Violation
Any	Lost	N/A	Any	Yes	Yes	Non-Customer	Device Violation
N/A	Returned	N/A	N/A	Yes	Yes	Non-Customer	Device Violation
Any	Stolen	N/A	Any	Yes	Yes	Non-Customer	Device Violation
N/A	Test	N/A	N/A	Yes	Yes	Non-Customer	Device Violation

6.2.3 Agency-Specific Violation Processing

All violation processing is determined by the facility where the violation occurred. In other words, a violation that occurs on an Away Agency facility will follow that Away Agency's processing and noticing rules regardless of whether the violator was a customer or a non-customer.

6.2.4 Batch Processing

Images and violation transactions will be matched based upon the date, time, plaza and lane information. Each of the images and transaction will contain the unique date, time, plaza and lane combination information to allow automated back office process to link images and violation transactions and batch them together for further processing. These batches are then sent to image review for capturing license plate and vehicle information.

It is possible that for some of the violation transactions, there will not be matching images. For example, a lane may fail to capture an image (possibly due to operator or equipment error) or the images captured may be of too poor a quality to process. Such Violations cannot be processed further since they cannot be linked to a customer for noticing. Violation reports will indicate those pending transactions and unmatched images/transactions. Unmatched images and/or violation transactions are retained by the system until matches can be found or until manual action is taken to discard the violation (based upon age).

Reviewed images will be archived after a certain period, which is configurable. Two parameters that determine the archival period are the volume of images and online storage capacity. Images that are archived, free up online disk storage, but increase access time to access archived images. VECTOR has a mechanism to retrieve archived images based upon a request from a CSR. VECTOR will place such requests, while in a queue for processing, by an automated image retrieval process. Once retrieved, archived images are handled as online images.

6.2.5 Image Review

Violation image review is performed by CSRs who visually examine the vehicle images captured at the lanes (typically four to six images depending upon the lane configuration). CSRs view images and input information based upon the type of violation batch they are examining. For toll evasion violations, they can enter the license plate state and number as well as the make of the vehicle. For class mismatch violations, CSRs can agree or disagree with the categorization. In either case, if the license plate image is not readable, the CSR can enter an image reject code. Currently there is no provision for verification by a second person after CSR image review, although such capability may be easily added.

Vector image review software provides the capability to enhance the visibility/details of the image in order to better determine the plate state/numbers, using contrast and darken controls. It is also possible to printout a violation image.



VECTOR also supports external image reviews for Agencies that desire to perform their own analysis. To support this, VECTOR will provide the transaction information (including the images taken) and expect the Agency to return the transaction information (minus the images) and the license plate information obtained from the image review needed for further processing by VEMS. In this case VECTOR will not store the images since they reside at the Agency conducting external image review. As a result, images for external review will not be available in VECTOR after review, for reference (i.e. dispute). That responsibility would be assumed by the Agency conducting external image review.

6.2.6 Image Reject Codes

Table 20 contains the reject codes that will be used by the image review clerks to qualify the reason for rejecting an image. Agencies can also specify additional reject codes to meet their unique needs.

Table 20 Image Reject Codes

VECTOR Reject Code	Description
BRIT	Too bright.
DARK	Too dark.
CORR	Corrupt - Possible reasons: Multiple copies of same image; no overlay; corrupt overlay; overlay does not match image header; portion or all of image is blacked out, snowy, distorted, or contains sunspots
ALGN	Camera is out of alignment, including: Vehicle or part of vehicle in image but plate is cut off to side, top, or bottom; camera not pointing at lane but at curb or canopy.
RJNV	No vehicle in image; camera properly aligned.
RJPL	Plate blurry, out of focus, or contrast is low.
NOTR	Image has no matching violation transaction. Note: This is an image reject prior to image review.
RMMP	Plate mismatch - Front and rear license plates do not match for vehicles other than tractor-trailers.
OBST	Plate is obstructed - e.g. trailer hitch, tire. Note: Certain obstructions, such as snow, must use the code WEAT.
STAT	Can't determine the state of the plate; the plate is a special plate like Purple Heart, etc.
ROFF	Emergency vehicle - ambulance, fire truck or police. Note: Authority vehicles are NOT to be rejected.
WEAT	Weather conditions, including a license plate obstructed by snow; a snowplow in the lane, or a person shoveling in the lane.

6.2.7 License Plate Availability

After an image batch is reviewed by a CSR, the records will be updated with the vehicle license plate information or an image reject code. For those transactions where the image was rejected, the violation revenue will be uncollectable. VECTOR will create a file/report with a list of all rejected transactions. This information can be used by the Agency to improve the performance of its lane image capturing process/system. The transactions where license plate information was obtained will be batched and processed further.

6.2.7.1 Customer Violators

VECTOR takes the license plate numbers that are identified through the Image Review process, and performs a lookup against the database of customers to determine if the license plate is registered to a customer account. If more than an Agency-defined number of ITOL transactions have posted to an account within the current month, an ITOL letter will be generated and sent to the customer. This letter will advise the customer that the device(s) on their account may be bad or mounted incorrectly and that they should contact the CSC to resolve the problem.

VECTOR will then check the account status to determine if the transaction can be posted. If the account is in a good or low balance status (with a balance greater than an Agency-defined threshold) then the transaction will be posted. For a customer, the system will post the toll transaction and discard the fine that would normally accompany the violation. If the account status is revoked final (for Agencies that support revocation), the transaction will be treated as if the violator was a non-customer.

If the license plate is identified but does not match an Agency customer account, then VECTOR will check to see if it belongs to an IAG customer. Agencies who participate in the IAG, share customer information through file transfer. The IAG Agencies are identified in Table 21. Two files are transferred according to IAG agreements. The first contains a full list of an Agency's customer devices (valid and invalid). The second contains the Agency's customer license plate information. The file formats and the specifics regarding file transfers are defined in the Inter-Customer Service Center Interface File Specification document. When a violator is identified as a valid IAG customer, the transaction information is sent to the customer's Home Agency for reconciliation and payment.

This lookup goes against both the Home agency accounts on file, as well as, Away agency data received via a Reciprocity File of license plate data. If a match is found then the transaction will be treated as an ITOL transaction. VECTOR will track the number of ITOLs that post to an account.

6.2.7.2 Non-Customer Violators

If VECTOR cannot find a match for the license plate information against those on file from both Home and Away Agencies (a non-customer), a request to the DMV will be made to obtain the vehicleowner's name and address. While awaiting the response from DMV (which could take several days), VECTOR will place the violation processing on hold. During this hold period, should another violation occur in which image review identifies the same license plate, VECTOR will initiate another DMV lookup request.

Should the response from DMV not include a name and address, VECTOR halts further processing, as this violation is unenforceable (no owner address to mail the notice). If the DMV response includes an owner's name and address, VECTOR will first check to see if the name and address information exactly match information on file for an Agency customer. Should a match occur, the vehicle information in the violation will be added to the customer's account and the transaction will be posted as an Image Toll (ITOL) for normal posting to the customer's account (i.e., without a violation penalty). Should a match not occur (still a non-customer), VECTOR will create a new customer account (with the name, address and license plate indicated in the DMV response) and complete the non-customer violation noticing process. The VECTOR account is created to aid in tracking and resolving the noticing process. The owner of the license plate in question is still considered and treated as a non-customer.

Once a new account is created, subsequent violation transactions recorded against the same license plate will not be referred to DMV for lookup, since owner information is available. The subsequent violation transactions will, however, affect the noticing that takes place as discussed in follow-on sections.

To handle the DMV lookup request, VECTOR interfaces with another ACS product that has connections to the DMV's for all 50 U.S. states as well as most Canadian provinces. VECTOR will only make requests to the DMV's for states with whom the Home Agency has an agreement in place. Processing of violators from states without such agreements will not be possible and any potential revenue will not be collectable.

Table 21 Agency IDs

Agency ID	Description
000	Manufacturer (Mark IV)
001	Regional CSC
002	New Jersey Highway Authority
003	New Jersey Turnpike Authority
004	New York State Thruway Authority
005	Port Authority of New York & New Jersey
006	Pennsylvania Turnpike Commission
007	South Jersey Transportation Authority
008	MTA Bridges & Tunnels
009	Delaware River Port Authority
010	Smart Tag, Virginia
011	Highway 407, Canada
012	MetroDade, Florida
013	Peace Bridge, New York
014	Ambassador Bridge, Michigan
015	Illinois State Toll Highway Authority
016	Maryland Transportation Authority
017	South Carolina DOT
018	New York State Bridge Authority
019	Delaware DOT
020	Advantage I-75
021	Massachusetts Turnpike Authority
022	New Jersey Regional Consortium
023	New Brunswick (Canada) Highway Corporation
024	West Virginia Parkways Authority
025	Delaware River and Bay Authority
026	New Hampshire DOT
027	Burlington County Bridge Authority
028 – 127	Reserved for future device issuing agencies
128	Albany Airport



Agency ID	Description
129	Buffalo Airport
130	McDonalds
131	Port Authority of New York & New Jersey Airports
132 – 999	Reserved for future non-toll facilities

6.2.8 Notices

6.2.8.1 Grouping of Violation Transactions for Noticing

VECTOR allows a facility to specify the number of violation transactions to be grouped in a notice per account. If more than one violation transaction for the same account and for the same agency is processed on the same day, then these transactions would be grouped onto the same notice. For example, assume that on a specific day, image review identified five violations for violator account #123. All five violations would be combined and printed on a single violation notice.

6.2.8.2 Administrative Data Mailhouse

VECTOR sends, via electronic file format, the details regarding violation notices to an Administrative Data Mail house (ADM) for actual notice generation and mailing. The ADM sends a verification file back to VECTOR to track the status of when the notices were mailed out. This information is critical for citation processing and escalations purposes.

Included within the electronic file format from VECTOR is a flag indicating whether the notice should be mailed in standard mail or emailed. If the email option is selected, the VECTOR file also contains the email address. Although VECTOR is capable of emailing violation notices, no agencies have chosen to implement this option due to the more assured delivery of direct mailing.

6.2.8.3 Notice Types

VECTOR supports two different schemes for toll evasion noticing as illustrated in Table 22, and to simplify referencing of notices in further discussions, each notice is labeled with a letter. A complete set of all notices exists for both customer and non-customer violations. The only difference between the two types of notices is the reference to device number in customer notices (since a device was read) versus license plate number (since no device was read) for non-customer notices (see Section 6.2.1). NOL is an optional level of noticing available to the Agency.

Table 22 Notice Types

ID	Short Description	Long Description	Agency	Citation Type
1	PAA1	Port Authority First Notice Ever	Port	TE
2	PAA2	Port Authority First Notice	Port	TE
3	PAB	Port Authority Second Notice	Port	TE
4	PAC	Port Authority Third Notice	Port	TE
5	NYA	NYSTA First Notice	NYSTA	TE
6	NYB	NYSTA Second Notice	NYSTA	TE
7	NYC	NYSTA Third Notice	NYSTA	TE
8	NOL	NYSTA Notice Of Liability	NYSTA	TE
9	WRNP	Speed Warning Private		SPEED
10	WRP2	Subsequent Speed Warning Private		SPEED
11	S60P	Speed 60 Day Suspension Private		SPEED
12	180P	Speed 180 Day Suspension Private		SPEED
13	RVKP	Speed Revocation Private		SPEED
14	WRNB	Speed Warning Business		SPEED
16	S60B	Speed 60 Day Suspension Business		SPEED
17	180B	Speed 180 Day Suspension Business		SPEED
18	365B	Speed 365 Day Suspension Business		SPEED
19	WARN	Class Mismatch Warning	PORT	Class Mismatch
20	FINE	Class Mismatch Fine	PORT	Class Mismatch
22	WRNF	Speed Warning Fleet	NYSTA	SPEED
23	PACOLL	Sent record to coltek for collection of due amount.	PORT	TE
24	DBA	DRBA First Notice	DRBA	TE
25	DBB	DRBA Second Notice	DRBA	TE
26	DBC	DRBA Third Notice	DRBA	TE
27	MDA	MdTA First Notice Ever, NTD	MDTA	TE
28	MDB1	MdTA Second Notice, NOL	MDTA	TE
29	MDB2	MdTA NOL, Repeat offender (Direct Escalation)	MDTA	TE
30	MDC	MdTA Third Notice, Civil Citation	MDTA	



Table 23 Toll Evasion Violation Notices Example 1

NOTICE REFERENCE	NOTICE HEADER	ESCALATION LEVEL	DESCRIPTION
A	<i>blank</i>	First notice	Includes any new violation transaction(s). Waiving of fee is Agency dependant
B	Notice of Delinquency	Second notice	Includes violation toll(s) and fee(s) on Notice A that have not been paid within 30 days of the Notice A mailing date.
C	Final Notice	Third notice	Includes violation toll(s) and fee(s) on Notice B that have not been paid within 30 days of the Notice B mailing date.
NOL	Notice of Liability	NOL	Includes any violation transaction that occurs after an account has become eligible for NOL processing. For an explanation of NOL, please refer to 6.2.11.

6.2.8.4 Toll and Fee Amounts

The table below, shows examples of the tolls and fees that can be assessed by each agency. VECTOR allows Agencies to establish their own toll fee amounts for violations that occur, on their lanes.

Table 24 Toll Evasion Tolls and Fees Example

Agency and Violation Type	Toll	Fee PER TRANSACTION
Away Agency 1 Tagged	Vehicle class per device.	\$25
Away Agency 1 Untagged	Vehicle class per AVC.	\$25
Away Agency 2 Tagged	Vehicle class per device. Maximum toll for exit point if entry point is not known.	\$10 for cars. \$20 for non-class 1 devices.
Away Agency 2 Untagged	Vehicle class group determined by image review (class 1 or non-class 1). Class 5 toll for non-class 1 vehicles. Maximum toll for exit point if entry point is not known.	\$10 for class 1. \$20 for non-class 1 devices.

6.2.8.5 Information Included in Violation Notices

VECTOR allows each Agency to format their notices individually. (i.e., the fees/fines to be charged and the escalation levels to be employed). In general, each notice contains the customer's name and address, information concerning the alleged violation(s) (lane and plaza, date and time, type of violation, details of the violation as recorded in the lane), the fee or fine assessed for the violation, actions required of the customer, and statements of what will occur should the customer not take the indicated action. As previously discussed, a given notice can encompass more than one violation as set by Agency specified business rules.

Note: VECTOR does not include a violation image in its notices.

In case of a multiple agency implementation in a single VECTOR system, VECTOR will generate separate violation notices for each serviced agency. Therefore, should a customer commit a violation on the facilities of two separate agencies, he/she will receive two notices -- even though both agencies may be serviced by the same VECTOR system. IAG Rules require each Agency to separately handle the violations that occur on their facilities.

6.2.9 Payments, Dismissals, and Write-offs

Both tolls and fees will be eligible for dismissal, subject to CSC policies and procedures, as agreed to by the agencies. The CSR will enter a specific dismissal code (see Table 25) for each toll or fee that is dismissed. The purpose of these dismissal codes is to identify the reasons that each dismissal was allowed.

Table 25 Toll Evasion Violation Dismissal Codes

Dismissal Code	Description	Comments
DCIF	Customer with insufficient funds	Problem with credit card; payment not made on time. Both the toll and the fee (if applicable) are dismissed and the correct Home Agency toll is posted manually to the customer's account.
DCST	Customer with valid account	A customer violation could be dismissed if their license plate number is not on their Home Agency account or the license plate on the account is incorrect. As a result, VECTOR does not identify the transaction as belonging to a Home Agency customer and therefore cannot post the toll. Both the toll and the fee (if applicable) are dismissed and the correct Home Agency toll is posted manually to the customer's account.
DCSY	Courtesy	ACS or one of the Agencies may decide to dismiss a toll and/or fee for a reason that is not represented by the other dismissal codes.
DDMV	DMV license plate problem	Plate was turned in; plate was stolen; duplicate plates; etc.
DISI	Image challenge	The violator challenges the violation and requests a review of the license plate image. Upon review, CSC determines that the license plate does not match the violator's plate and the violation is dismissed.
DISS	Stolen vehicle	Vehicle was reported to the police as stolen.
DNLM	Non-customer paid toll (left cash in lane)	"Violator" receives a violation then contacts the CSC claiming that they left cash at the lane but not with a toll collector.
DNPC	Non-customer paid toll to toll collector	"Violator" receives a violation then contacts the CSC claiming that they paid a toll collector. Violator does not always have a receipt as proof.
DNRV	Non-revenue passage at direction of the Agency	Agency advises ACS that the violation should be dismissed due to the non-revenue status of the vehicle.
DOTV	Dismissed fine – non-customer first-time violator	The CSC violations clerk according to the CSC's policies and procedures will apply this code manually.
DSKP	Skip read	Person has a valid ETC transaction and a matching violation transaction (cross lane reads, pass backs, etc). Most skip reads are filtered out by VECTOR prior to image review. For skip read transactions that are found post-image review, any tolls and fees will be dismissed using the DSKP code. This might be more common with reciprocity (Away Agency customer receives skip read and violation on Home Agency).
DITR	Transfer responsibility	Violation is transferred from one account to another (e.g. license plate belongs to a rental agency).
DISSPREPAY	Pre-paid violation	Violator sends payment for toll(s) to the CSC before receiving a violation notice. The CSC is able to match this toll payment to a specific violation notice and therefore must dismiss the transaction(s).
DISSUND5	Automatic dismissal	Refer to Section 6.2.9.2 Automatic Fee Dismissal for All Notices



6.2.9.1 Violation Payment

VECTOR supports Violation Payments through the following methods:

- Online Payment (via CSR entry)
- Batch Payment
- DP500 Batch Payment
- Web Interface (See Section 10.2)

Table 26, below, illustrates the various TE payment conditions that can result, and the actions taken by VECTOR when they occur.

Table 26 Toll Evasion Violation payment conditions and action by VECTOR

Viol Status	Payment<Toll	Payment=Toll	Payment>Toll<Toll+Fee	Payment=Toll+Fee	Payment>Toll+Fee
SENTTOMH	No Action	No Action	No Action	No Action	No Action
OPEN	Pay Part Toll; Pay No Fee	Pay Toll; Pay No Fee; Dismiss Fee	Pay Toll; Pay Part Fee; Dismiss Part Fee	Pay Toll; Pay Fee	Pay Toll; Pay Fee; Overpayment
PAID PART	Pay Part Toll and Fee if applicable;	Pay Part Toll and Fee if applicable;	Pay Part Toll and Fee if applicable;	Pay Part Toll and Fee if applicable;	Pay Part Toll and Fee if applicable; Overpayment
PAID FULL DISMISSALS	Overpayment	Overpayment	Overpayment	Overpayment	Overpayment
APPEAL	Pay part toll and fee, if applicable;	Pay part toll and fee, if applicable;	Pay part toll and fee, if applicable;	Pay part toll and fee, if applicable;	Pay part toll and fee, if applicable; Overpayment

6.2.9.1.1 Online Payment

Once the payment is accepted, the CSR accesses the citation screen, to select the citation and apply the payment to the citation. VECTOR allows the CSR to apply the amount received. If the amount applied is less than the amount due, then the status is partial paid. On the other hand, if the amount applied is greater than the amount due, then the excessive amount is applied as overpayment against the citation.

6.2.9.1.2 Batch Payment

VECTOR allows the CSR to input the payments in batch. One batch typically contains up to ten entries, each entry contains the notice number and the total amount needed to apply to the notice. Once all entries to a batch are successfully entered by the CSR, the payments can be applied at that time or they can be saved for posting through a batch job that can run during the night.

6.2.9.1.3 Additional Batch Payment

VECTOR allows the payments to be applied, using a file created from the DP500 scan machine. The process first reads the file received from DP500, it then stores it in the database. Fee dismissals for first notice

CSC clerks manually enter fee dismissals for first notices. VECTOR will allow such dismissals upon detection by CSC clerks.

6.2.9.2 Automatic Fee Dismissal for All Notices

Violation payments received for any violation notice will result in an automatic system dismissal of the violation fee balance, if both of the following conditions are true:

- The entire toll balance on the notice is paid in full
- The outstanding fee balance is less than \$5.00 (i.e. if fee balance is >\$4.99 another violation notice will be issued)

Example:

If a customer received a violation notice containing two violations with each having a toll of \$4 and a fee of \$25, then the total amount due would be \$58. If they paid \$53.01 (\$8 for the toll and \$45.01 for the fee), the notice will be dismissed.

6.2.9.3 Pre-Payments

Payments for violations that are received prior to a first notice (A, A1, A2) being generated will be maintained in a violation pre-payment file. These payments can be applied to the violation either pre-notice (via license plate match) or post-notice (violator calls CSC and explains that payment was mailed prior to receipt of the notice). In either case, if the payment amount is at least equal to the toll amount due then any remaining fee balance will be written off. As with normal violation payments, the CSC does not issue a receipt or other confirmation of payment.

6.2.10 Plate Correction

VECTOR allows the CSR to change the license plate information based upon a dispute from the customer. An image of the violating vehicle is available online and allows the CSR to update the violation.

6.2.11 Court Hearing Schedule Notice of Liability (NOL)

The Home Agency will issue NOLs to non-customer violators when all of the following conditions are true:

- Violator has two or more outstanding non-customer TE violations on Home Agency facilities
- One of the violations has been outstanding for 14 calendar days since the first notice "A" mail-date recorded in VECTOR

Once these conditions exist, each subsequent Home Agency violation transaction will be subject to NOL processing. However, the NOL will not be issued unless:

- The current date is within 30 days of the violation occurrence date
- A legible image of the license plate associated with the violation transaction is available

If all of these conditions are not met, a regular administrative notice will be sent. Each NOL will include only one violation transaction. NOLs will be closed based upon the disposition entered by the agency, the court, or the CSC. Table 27 lists the different NOL disposition codes. The Agency may define additional codes to meet their specific requirements.

Table 27 NOL Disposition Codes

Disposition Code	Open Flag	Status Description
DISM	N	Dismissed by court
LATE	N	Late NOL generation
LIAJ	Y	Liability ordered
LIDF	Y	Did not appear (default)
NEW	N	New NOL
NOIM	N	No image available
OPEN	Y	NOL generated
PDAD	N	Admitted, paid
PDDF	N	Default, paid
PDJD	N	Judgment, paid
WITA	N	Withdrawal, Agency
WITL	N	Withdrawal, ACS
WITN	N	Withdrawal, name change
WITR	N	Withdrawal, mail returned

6.2.12 Collection Agencies

To aid in the collection of violation revenue, an Agency can establish a relationship with a collection agency or agencies. Violator information will be passed to the collection agency by file transfer using a pre-defined format established by the Agency and each collection agency.

The information passed to the collection agency will be of two basic types: initial and updated. When a violator needs to be referred to a collection agency, their information is gathered into a file and transmitted to the collection agency. At this point the violator may attempt to correct the situation through the CSC. If the violator corrects the violation, VECTOR will send updated information regarding the account to the collection agency. If the violator contacts the collection agency and resolves the issue with them, the collection agency will send status and revenue information to VECTOR for posting to the customer's account.

6.2.13 Citation Appeals

After a violator receives a notice, they can contact servicing CSC to dispute the violation. VECTOR will allow the CSR to change the status of the citation to "appeal." When in the "appeal" state, normal escalation processing for a violation will be temporarily suspended. After the appeal is entered, later review by another CSR will either approve or deny the appeal. If the appeal is denied the normal escalation process is resumed.

6.2.14 Transfer of Responsibility

VECTOR will allow a change of responsibility for a violation from one person to another. An example of this would be rental car agencies. The rental car company can return the violation notice along with the customer information necessary for transference. VECTOR will then generate a new notice using the information, starting over in the escalation process for the "new" violation customer.

6.3 Class Mismatch

CLMM violations are ETC transactions where the class of the vehicle detected by the AVC equipment does not match the class of the vehicle indicated by the device. CLMM violation processing is limited to valid ETC transactions occurring on Home Agency facilities.

The transaction record will indicate the mismatch condition, as well as, the vehicle type and axles indicated by the device and the AVC. For most CLMM violations, images of the vehicle are captured and sent to the CSC for review (see 6.2.5).

Each Agency has its own criteria to determine what constitutes a class mismatch violation. Processing rules, timing, and tracking of violations are also unique to each Agency. These rules will be contained in the Agency-specific appendices of this document.

6.3.1 Private vs. Business Accounts

For private accounts, the warning notices, and tracking of occurrences and fees, applies to the entire account. While fees are assessed against a business account, the warning notices and tracking of occurrences apply only to the device. Business account processing, where applicable, is indicated in *italics*. Table 28, Class Mismatch Processing summarizes the generic class mismatch processing rules.

6.3.2 Image Review and Adjustment

Review of the image(s), if required (see Sections 6.2.5), will result in either the confirmation or rejection of a mismatch. Confirmed mismatches are further processed according to Agency specified rules (see Appendix A for Agency-specific information). Class mismatches will be processed according to the class type indicated by the lane.

Method 1: Image review and any necessary adjustments occur prior to the posting of transactions to customer accounts. This eliminates the need for account (or casual use) adjustments.

Method 2: Image review and any necessary adjustments occur after the initial toll is posted to the customer's account. All CLMM adjustments (which include the time, date, lane, and plaza of the original transaction) will appear on the customer's statement as individual line items. Due to timing, the adjustment(s) will most likely appear on a statement subsequent to the statement containing the original toll(s) posted.



Table 28 Class Mismatch Processing

CLMM Level	Tag Type = AVC Type?	Mismatch	Description	Processing Rules for Confirmed CLMM	
				Number of Level 1 Notices per Account	Action
1	No	Device Type < AVC Type	The type of vehicle as indicated by the device does not match the type of vehicle as indicated by the AVC and the device is for a lower fare than the AVC type.	1 st	Warning notice sent to account holder
				2 nd – 6 th (excluding grace period notices)	Initial fee per violation that is listed on the 2 nd CLMM notice. For subsequent notices the fee will escalate incrementally per violation per notice up to an Agency-defined maximum on the 6 th Level 1 notice. All fees are deducted from the customer's account balance.
				7 th +	Notice plus max fee sent to account holder.
				The toll amount charged to the account will be adjusted according to the vehicle type determined during image review. An account (device) that <u>does not</u> receive any Level 1 CLMM for a six-month period will be eligible to restart the notice cycle. For example, the next Level 1 mismatch (after a six month period without a Level 1 CLMM) will trigger a warning notice.	
2	No	Device Type > AVC Type	The type of vehicle as indicated by the device does not match the type of vehicle as indicated by the AVC and the device type is for a higher fare than the AVC type.	Image review is not required for this type of mismatch. The device determines the toll charged to the account. Images are kept for resolving complaints on a case-by-case basis.	
3	Yes (vehicle = car)	Device and AVC number of axles do not match	Vehicle type indicated by both the device and the AVC is a car. The mismatch is in the number of axles indicated by the device versus the number indicated by the AVC (e.g. a car towing a trailer).	The account is debited the proper amount according to image review and no further action is taken.	
4	Yes (vehicle = truck or bus)	Device and AVC number of axles do not match	Vehicle type indicated by both the device and the AVC is a truck/bus. The mismatch is in the number of axles indicated by the device versus the number indicated by the AVC.	The account is debited the proper amount according to image review and no further action is taken.	



6.3.3 Notice Processing

Please refer to the Appendix A for a total list of notices. Although the language in the notices threaten suspension and/or revocation, there is no provision for this type of processing in VECTOR. The system supports two different processing frequencies.

- Daily Processing – CLMM transactions belonging to an account (*device*) that have not yet been noticed will be grouped together daily on a single notice.
- Twice weekly Processing – CLMM transactions belonging to an account (*device*) that have not yet been noticed previously, will be grouped together into a single notice on the next processing date.

6.3.4 Notice Escalation & Fees

6.3.4.1 Escalation Counter

While Away Agencies will apply the same escalation rules outlined below in 6.3.4.2 Escalation Fees, each will maintain its own counter to accumulate the number of class mismatch violations against a Home Agency account (*device*). For example, a customer who receives three CLMM transactions on Away Agency 1 facilities and on the same day receives two CLMM transactions on Away Agency 2, facilities will receive two separate notices – one for each agency.

6.3.4.2 Escalation Fees

A warning notice will be sent to first-time CLMM violators. Repeat violators will receive a CLMM Violation notice with a fine applied to each transaction included on the notice. The fine per transaction for the second violation notice will be defined by the Agency. The fine amount per transaction will escalate in Agency-defined increments for each subsequent violation notice (escalation is per notice, not per transaction). The Agency will establish a maximum fine per transaction. For example, assume an Agency defines a \$10 fine per transaction and an incremental fee of \$10, with a maximum of \$50 per transaction. A customer with five CLMM transactions on their second notice (first notice is a warning) would then receive a \$10 fee on each of the five transactions (for a total fine of \$50). If the same customer violates again, they will receive another notice with a \$20 fee applied to each transaction. The fee will continue to escalate in \$10 increments until the customer reaches their sixth CLMM notice (\$50 fee per transaction). All subsequent notices for this account would continue to have a \$50 fee applied to each CLMM transaction.

Fees will be automatically deducted from the account balance (once a notice mail-date is returned from the mail-house) and reflected in a report used for determining the correct amount of funds to be exchanged between agencies.

6.3.5 First Notice Escalation Grace Period

To allow time for first-time CLMM violators to be warned and change their behavior, a grace period will be provided on first notices. The grace period will be in effect for ten calendar days after the first notice mail-date. During this period of time, all CLMM violations on the same account (*device*) will

generate warning letters only. CLMM violations that occur after the grace period has ended will escalate normally, as described earlier.

6.4 Speed Violations

A speed violation occurs on Home Agency facilities when a customer exceeds the agencies' speed thresholds. Speed enforcement is applicable only to Home Agency customers regardless of whether their account is valid, or invalid due to insufficient funds (non-customers or customers with no device read are not processed for speeding).

Speed enforcement will result in speed violation notices and the possible suspension or revocation of a customer's account (for private accounts) or device (for non-revenue, business and commercial accounts). For example, a private account holder whose son is caught speeding in a lane will cause all family members with devices (up to four total) on the account to also suffer from the speed suspension. On the other hand, a non-revenue, business or commercial account holder could have hundreds of devices on the account. Speeders on those accounts will affect only their own device.

Unlike toll evasion or class mismatch notices, there are no fees associated with speed notices. As a result, Agency business rules do not have speed violations triggering image capture (although VECTOR could do so).

Home Agencies can support postpaid Commercial accounts, as well as pre-paid Private and Business accounts. Enforcement of speed policy for Commercial accounts is outside the purview of the CSC. Commercial accounts that use other than Home Agency facilities, will establish a pre-paid business account for that purpose and will be subject to the business account speeding policies (i.e. device-level suspension when traveling on these facilities).

6.4.1 Speed Thresholds

Agencies can configure the speed thresholds on their facilities by plaza, lane, account type, and speed range. In addition, they can choose to trigger automatic speed suspension (section 6.4.4.4) and FAST speed reporting (section 6.4.5) by the same parameters. Table 29, Speed Threshold Examples, shows a fictitious example of the flexibility of speed threshold settings.

Table 29 Speed Threshold Examples

Plaza	Lane	Account Type	Automatic Suspension	FAST Speed	Lower Speed Threshold (MPH)	Upper Speed Threshold (MPH)
1	1	Private	No	No	31	39
1	1	Private	Yes	No	40	49
1	1	Private	Yes	Yes	50	999
1	1	Business	No	No	31	39
1	1	Business	Yes	No	40	49
1	1	Business	Yes	Yes	50	999
1	1	Non-Revenue	No	No	31	39
1	1	Non-Revenue	Yes	No	40	49
1	1	Non-Revenue	Yes	Yes	50	999



Plaza	Lane	Account Type	Automatic Suspension	FAST Speed	Lower Speed Threshold (MPH)	Upper Speed Threshold (MPH)
1	2	Private	No	No	25	34
1	2	Private	Yes	No	35	45
1	2	Private	Yes	Yes	46	999
1	2	Business	No	No	25	34
1	2	Business	Yes	No	35	45
1	2	Business	Yes	Yes	46	999
1	2	Non-Revenue	No	No	25	34
1	2	Non-Revenue	Yes	No	35	45
1	2	Non-Revenue	Yes	Yes	46	999

6.4.2 Agency Independent Processing

Similar to toll evasion processing, each Agency will maintain its' own tracking and processing of speed violations that occur on its' facilities. As a result, it is possible for a customer to receive notices and sanctions (suspensions and revocations) from more than one Agency. It is also possible for sanctions to run concurrently. For example, a customer could receive a 60-day suspension from Agency one and then, 15 days later; receive a 180-day suspension from Agency two. Both sanctions, if not appealed, would start independent of each other and the customer would serve both.

6.4.3 Notices and Sanctions

VECTOR will process speed notices daily. Each speed violation notice will include only one transaction and unlike toll evasion notices, follow-up notices for the same violation transaction will not be issued.

6.4.3.1 Speed Sanctions

Speed sanctions apply to an entire private account, but only apply to the specific device that incurred the violation on a business account. A violation will only be escalated if it occurs within six-months of a prior violation on the same account (private) or device (business, commercial and non-revenue). When it is determined that a device should be speed suspended, it will remain with that state in the tag validation file until the suspension period has been completed. Speed sanctions imposed on a device or account will be upheld at all IAG facilities, not just Home Agency facilities. Devices that are speed suspended also have an invalid tag status sent to other Away agencies as part of the Tag Validation File. Table 30 illustrates the speed notices and sanctions that can be imposed.

Table 30 Speed Notices and Sanctions

# OF SPEED VIOLATIONS	NOTICE AND SANCTION
1	Warning
2	Suspension 60 days
3	Suspension 180 days
4	Revocation (Private accounts only) – ETC privileges are revoked; customer must return device(s) to the CSC. One-year Suspension (Business accounts only)

6.4.3.2 Suspended Accounts

When an account is suspended, any associated discount plans are also suspended. Prepaid tolls and deposits are not refunded when an account is suspended. The customer must close the account to retrieve these funds. Customers attempting to use a suspended device will receive a toll evasion violation notice.

6.4.3.3 Suspension/Revocation

Suspensions/revocations will start 14 calendar days after the notice mail-date and can be served concurrently.

6.4.3.4 Speed Counter

Speed warnings and suspensions are tracked separately for each device or account that receives a speed violation. If a speed violation occurs on a device or account that has a warning that is not currently in appeal status, then the violation will be escalated to a 60-day suspension notice. The counter for suspensions will be reset to zero if a customer does not incur a speeding violation for 180 days after a warning notice has been mailed or a suspension has been satisfied. For complete details on this process, please refer to the process flow diagram Speed Enforcement Notice Processing (Figure 4). Table 31, Speed Notice Examples, illustrates some possible speed noticing scenarios.

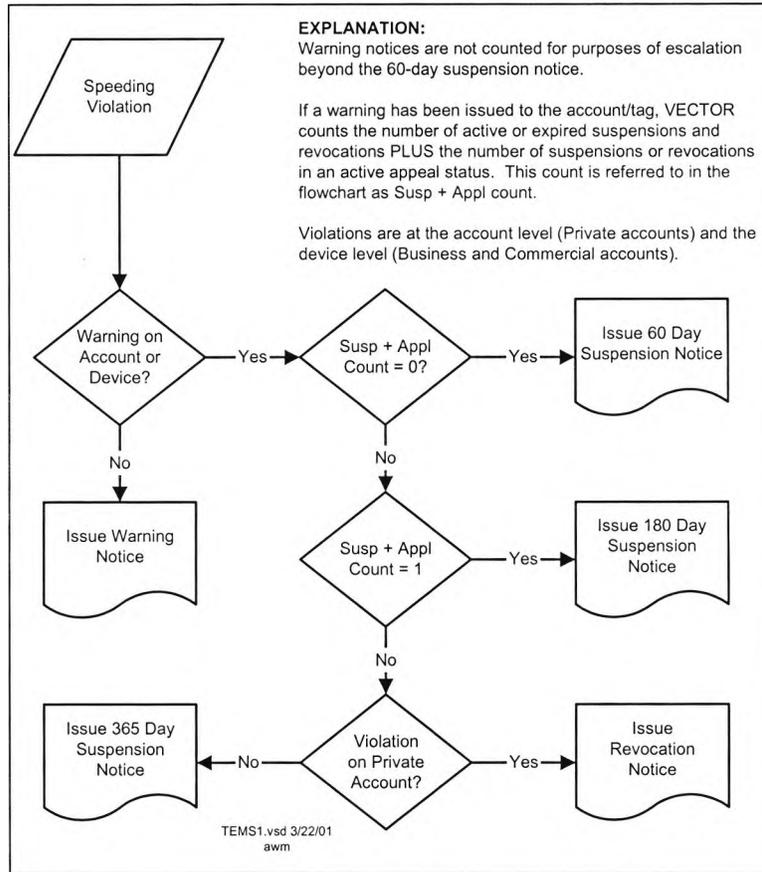


Figure 4 Speed Enforcement Notice Processing

Table 31 Speed Notice Examples

Scenario	Notices Issued to Account	Appeal Approved	Notice Level for Next Violation
A	WARN	Yes	SUSP180
	SUSP60	No	
B	WARN	No	SUSP60
	SUSP60	Yes	
C	WARN	Yes	WARN
	SUSP60	Yes	
D	WARN	Yes	WARN
E	WARN	No	SUSP60
F	WARN	Yes	SUSP180
	SUSP60	Yes	
	SUSP180	No	
G	WARN	No	SUSP180
	SUSP60	No	
	SUSP180	Yes	
H	WARN	No	SUSP180
	SUSP60	Yes	
	SUSP180	No	

6.4.3.5 Account Maintenance

Table 32 describes the various actions that are permitted against a suspended or revoked account and those that are prohibited.

Table 32 Account Maintenance on Suspended Accounts

Permitted Actions	Prohibited Actions
Change address and demographic information	Purchase a new device
Close the account	Change/add vehicle information
Generate and mail letters (e.g. expired credit card)	Add a discount plan
Generate and mail statements	
Process any type of payment	
Reevaluate replenishment information	
Change device status to LOST or STOLEN	

6.4.4 Appeals

6.4.4.1 Appeal Requests and Processing

CSRs at the CSC will handle initial inquiries regarding speed violation notices and sanctions. Customers wishing to appeal a speed notice will be told to put their appeal in writing and send it to the CSC.

When the CSC receives a written appeal, the suspension or revocation (if any) will be put on hold automatically once the clerk enters the appeal into VECTOR. The appeal will then be forwarded to the appropriate agency for review. Finally, a letter of acknowledgement will be sent to a customer advising them that the appeal was received and will be reviewed. Refer to the appendix for a sample letter of acknowledgement.

6.4.4.2 Appeal Review by Agency

Only the Agency can approve or deny a customer appeal. Each agency's representatives will have access to the CSC database in order to review the speed violation history of customers who are appealing a notice. No specific system codes are associated with an appeal decision; however, a notes field will be available for capturing details concerning the appeal. The agency representatives will enter their decision directly into the customer's record. This entry will automatically generate an appeal decision letter at the CSC that notifies the customer of the agency's decision and the suspension/revocation start and end dates (if necessary). If the appeal is denied, the suspension or revocation will go into effect 14 calendar days after the appeal decision letter mail-date. Refer to the appendix for a sample letter of denial/approval.

6.4.4.3 Concurrent Suspensions/Revocations

If a customer receives a speeding violation while another violation is under appeal, the new violation will trigger the next level notice and sanction (i.e. normal processing will proceed as if the appeal did not exist). Any sanction associated with the new violation will still go into effect regardless of the outcome of the appeal.

6.4.4.4 Automatic Suspension

In addition to the minimum speed thresholds, ETC customers traveling through Home Agency facilities will also be subject to automatic suspension for speeding. Speed violators who speed in an Agency specified range would automatically be suspended for 60-days assuming there are no other outstanding speed suspensions for the account. If the account already has an outstanding suspension, a new violation meeting the auto-suspension criteria would escalate the suspension level. Speed limits are adjusted by the Agency.

6.4.5 FAST Speed

Speed violations in excess of an Agency specified threshold will be included on a FAST report. The CSC system will delay processing these as speed violations until it can be verified that the lane equipment responsible for recording the speed was accurate at the time the violation occurred. VECTOR will set the transaction status to FAST. Transactions in a FAST status will not be considered for escalation of violation notices. If the speed is correct then an automatic suspension of

60 days will apply. If the speed is incorrect then VECTOR will ignore the violation for escalation purposes. The Authority will notify the CSC in writing if the equipment was verified to be accurate.

6.4.6 Fleet Vehicles

All speed violations committed by fleet vehicles will result in the issuance of a standard speed-warning letter to the fleet account owner. VECTOR or the CSC will take no further action.

6.4.7 Speed Exempt Lanes

Agencies can designate lanes that are not subject to speed enforcement (example: Express Bus Lane).

6.5 Lane Exception Warnings

Certain lanes can be demarcated during specific times of the day for use by a restricted set of vehicle types. An example would be a bus-only lane. Customers who use these lanes with the wrong class of vehicle need to be reminded of the fact that they are not supposed to use those lanes.

VECTOR will send lane exception violators a warning letter informing the customer of their misuse of the lane. The Agency can specify the number of lane exceptions a customer must receive in a given time period before a letter is sent. Multiple infractions can also be grouped onto a single lane exception letter. The Lane/Host system will categorize this type of transaction and mark them as lane exceptions.

7. System Administration Management Subsystem

7.1 Overview

The SAMS provides the key functions as summarized below. The following discussion in the chapter provides more detailed information.

- Security Functions

VECTOR combines centralized and decentralized procedures to provide both tightly controlled user access and auditing features, while ensuring rapid turnaround to the user group. This approach provides controlled electronic entry and physical security controls. It prevents unauthorized access to the system and guards against theft of property and services.

- Information Maintenance

VECTOR allows authorized personnel to centrally maintain employee, service center, and plaza/lane information. Additionally, VECTOR allows authorized employees to enter Fee Rate Schedule information for further transfer to VECTOR lanes for use in calculating the initial toll to charge customers.

7.2 Security Functions

A VECTOR client workstation must be registered with the server in order to have access to the system. Every user of VECTOR will have a unique ID and password that must be entered and validated before access will be granted to the system. The user ID determines which components of the application can be accessed, what data can be viewed, and the level of permission that is granted to the user. .

VECTOR security functions consist of:

- Client application access
- Application function access
- Security checks
- Password maintenance

7.2.1 Client Application Access

Control for internal and external system access is accomplished using fully auditable security policies, procedures, and standards. These measures ensure the integrity and reliability of the data, programs, and system. VECTOR provides the following capabilities to implement the security measures:

- The use of user ID naming conventions
- The implementation of global user ID controls
- The implementation of password control parameters

Although they are procedural, VECTOR allows for regularly scheduled audits of user IDs, and the physical segregation of operational functions.

7.2.2 Application Function Access

User access to the information in the system is provided only through the client portion of the application software. The system administrator defines distinct combinations (functional groups) or subsets of available client functions in VECTOR that are referred to as roles. Access to each function in a role can be denied, limited, or fully granted.

Each employee is assigned a unique system-generated employee ID. By assigning one or more roles to an employee's ID, access to system components can be restricted to those that are relevant to the employee's function. Creating an unlimited number of roles facilitates the task of varying job functions, for example, cross-trained employees and substitutes. The system administrator can change an employee's role(s) as necessary (promotions, job change, etc). Every time a role or employee is created or modified, VECTOR will track these changes for auditing purposes.

7.2.3 Security Checks

Client security covers two distinct areas. First, VECTOR ensures that the configuration of the client workstation and of the application software has not been altered. Second, it provides access control to the system. Security measures in the second phase incorporate the following checks:

- **Application Software Check**
The process is initiated by ensuring that the application software is correct. VECTOR verifies that the client application on the workstation is the correct version and has not been modified. If the client application software varies from what it should be, VECTOR will update/replace the client software. The system maintains a history of all updates and can be used for auditing by the system administrator.
- **Account Validation**
When the client application is launched, VECTOR determines if the workstation has been registered. After the machine has been validated, the user will be prompted for their employee ID and password. The system will then determine what functionality the user has access to and loads the client application for the validated employee.
- **Access Control**
Each employee is associated with a role or roles, which enables employee access only to

system components relevant to their job function. The client application will be dynamically configured to only permit access to the functionality defined by their role(s).

7.2.3.1 Data Protection

Due to the nature of the system, the protection of the data is of paramount importance. All information that is received or transmitted is stored in its native format. All changes to data in the system is captured and tracked. Data access is protected at various levels as described above. In addition, VECTOR provides backup and disaster recovery functionality.

7.2.4 Password Maintenance

VECTOR passwords can be a maximum of 20 characters and may not contain non-printing characters, spaces or slashes.

VECTOR maintains a record of the last three passwords used by each user to prevent their reuse.

VECTOR forces all users to change their password each month. Users may elect to alter their passwords more frequently if desired.

7.3 Information Maintenance

7.3.1 Employee Information

The system administrator must enter information into VECTOR about every employee that will have any access to the system. Demographic information, role(s), employee ID, and password are some of the data that VECTOR will track. The complete set of employee information tracked by VECTOR is shown in

Table 33 below.

VECTOR LPMS also use this employee information to control employee access to LPMS and LCMS functionality via authorized login, using the Default Location to specify the plaza at which LPMS and LCMS personnel are normally employed.



Table 33 Employee Information Tracked by VECTOR.

Item Name	Description / Explanation
Employee ID	ID number used in system to uniquely identify employee
Title	Title of the employee within the Agency / organization
First Name	
Last Name	
Middle Initial	
Social Security Number	
Birth Date	Date of birth of the employee
Date Hired	Date employee was hired
Termination Date	Date employee was terminated or left
Default Location	Primary work location for the employee
Employee Roles (one or more)	Define employee's permissions when using VECTOR
Login Name	Name employee uses to login to the system
Password	Employees' password or Personal Identification Number when logging onto VECTOR

7.3.2 Service Center Information

VECTOR provides the system administrator with the capability to add new service centers and update the information associated with existing ones. Both physical and network information is collected for use by the system.

7.3.3 Lane/Plaza Information

Similar to the service center functions, VECTOR supports the creation and modification of plazas. Information such as plaza address (physical and network), toll fares, and the two digit abbreviations are maintained for printing on statements. This information can also be used to categorize reports that the system can produce.

7.3.4 Lane Fee Rate Schedule

VECTOR enables a properly authorized individual to enter Lane Fee Rate Schedule information that will be downloaded by the LPMS for transferal to their associated lanes. The LCMS (lanes) will use this information to compute the initial toll to be charge. Use of the data-driven Fee Rate Schedule allows for quick and easy changing of toll fee rate structure and for implementation of congestion pricing.

8. Lane/Plaza Management Subsystem

8.1 Overview

The Lane/Plaza Management Subsystem (LPMS) provides the following key functions:

- Plaza Supervisor Functions

The Plaza Supervisor subsystem provides the functions necessary to monitor and control toll collection operations. The subsystem includes screens to monitor current lane activity at each plaza, review current lane history, review lane message history, control the lane operational mode and status, and view trend analysis graphs. VECTOR also provides different levels of access for a variety of personnel. A supervisor may be granted read only access to a particular plaza, full authority of several plazas, or anywhere in between.

- Recording & Tracking Revenue

This system provides tight security for functions that enter, adjust, or track revenue. Manual cash deposits are recorded at the end of TODs, and the lane transactions are updated in real-time. This combination allows for a real-time audit capability for toll collection.

- Computerized Maintenance Management System (CMMS)

CMMS was created to incorporate the option of interaction to digital pagers, and the LCMS. The heart of the CMMS system is the maintenance terminal. Lane devices send error messages to the CMMS for processing. CMMS determines the validity of the error and prioritizes it. CMMS then starts the paging process, if necessary.

8.2 Plaza Supervisor Functions

The Plaza Supervisor functions consist of:

- Monitoring the Plaza
- Reviewing the current lane activity
- Reviewing the lane message history
- Opening & closing a lane
- Logging in the toll collector
- Viewing the trend analysis

8.2.1 Monitoring the Plaza

VECTOR provides the Toll Supervisor with the ability to monitor the plazas in real-time. The Toll Supervisor can select a particular plaza to monitor and the relevant lane information will be displayed by the system. The lane information that can be monitored includes the current mode (e.g., Dedicated ETC, Manual, Detour), current state (Open, Closed, Standby), and most recent transaction processed at the lane. The transaction information that can be displayed consists of the revenue type (e.g., Cash, Non-revenue, ETC), the vehicle's class and axle count, and the expected cash value (amount) of the toll. Any violation transactions will be displayed in red so that the Toll Supervisor can identify them.

8.2.2 Reviewing Current Lane Activity

The Toll Supervisor can view detailed information about any given lane. By selecting a particular lane, the supervisor can monitor the most recent transactions and their details in real-time. VECTOR will display the ID and time of the transaction; the vehicle's axle count as reported by the lane equipment, collector, and the ETC device; the revenue type and amount; and the ETC device ID and status. The Toll Supervisor can control the number of transactions shown.

8.2.3 Reviewing Lane Message History

The Toll Supervisor can view the recent messages sent from the lane to the plaza. By selecting a particular lane, he / she can view time and messages that the lane generated. Lane messages include things such as equipment faults, lane violations, lane status changes, and collector login/logoff messages, and toll transactions. The Toll Supervisor can control the number of messages displayed. The Toll Supervisor can also review the history of the last few transactions.

8.2.4 Opening & Closing a Lane

The Toll Supervisor can open and close ETC lanes through VECTOR. The system will display a list of the available lane modes (ETC or Detour), lane states (Open, Close, or Standby), and whether the camera is off or on. The Toll Supervisor may change any of these values by simply clicking on the appropriate choice and VECTOR will send the message to the lane.

8.2.5 Logging in the Toll Collector

For security purposes, VECTOR provides the Toll Supervisor with a mechanism to deny a collector's login or to remotely login a collector. When the system does not accept a collector's login information, notification will automatically be displayed on the Toll Supervisor's screen. The plaza ID, lane number, collector ID, time of logon attempt, and number of seconds remaining before the system will automatically deny the login without supervisor intervention will be displayed. The Toll Supervisor may override the login rejection and allow the collector to login or he / she can immediately deny the login.

8.2.6 Viewing Trend Analysis

The Toll Supervisor may examine trends for a particular lane through VECTOR. By selecting a particular lane, he / she can view the number of vehicles that have passed through (by hour) over the last twenty-four hour period.

8.3 Recording & Tracking Revenue

Recording & Tracking Revenue consists of:

- Revenue Bags
- Toll Collector Financial Reconciliation

8.3.1 Revenue Bags

A revenue bag is used to track different types of revenue by the Toll Collector. VECTOR supports a variety of different revenue types such as cash and tickets. For example, a collector could have one revenue bag for all his/her cash transactions and another for the collected tickets. At the end of the TOD, the amounts in each bag would be entered into VECTOR and would be tracked separately.

8.3.1.1 Revenue Bag Inventory

Revenue bags are used to collect the payments made by customers to the Toll Collectors. The bags are assigned unique identification numbers prior to use and can be used to track revenue through the system. VECTOR currently supports payments made by cash and ticket. A Toll Collector would have revenue bags assigned to him / her at the beginning of his/her TOD. The Toll Supervisor would initialize new revenue bags in inventory by entering them into VECTOR. After initialization, a revenue bag goes through various stages before they are reused or destroyed. These stages include bag assignment, bag deposit, deposit verification, and finally bank deposit. VECTOR can support single use revenue bags where a particular ID can never be recycled, or reusable bags.

8.3.1.2 Revenue Bag Assignment

At the start of their TOD, Toll Collectors are issued empty bags to be returned at the end of the TOD. These are used to hold the revenue that the collector receives during their shift. The Toll Collector can make multiple deposits during the TOD, but each deposit requires a unique revenue bag. The Toll Supervisor may issue the collector additional bags, but all unused bags must be returned at the end of the TOD.

8.3.1.3 Revenue Bag Deposit

Each time a Toll Collector returns a bag, the revenue to be deposited must be counted before logging on to the toll system. The Toll Collector separates the revenue by type (coins, currency, tickets) and then sorts each by denomination (quarters, dimes, \$1 bills, etc). Deposits are entered by type and denomination. This helps to ensure the accuracy of the deposit. When a Toll Collector makes multiple deposits, they are all added together to generate a total at the end of the TOD.

8.3.1.4 Deposit Verification

Toll Collectors verify their deposits by recounting all of the revenue that they collected during their TOD at the end of the day. They enter these recounts into VECTOR, which compares them with the original entries. After verifying the numbers, the revenue can be moved into new revenue bags if desired. In this way, one set of bags can be used for collector revenue and another for making bank deposits.

8.3.1.5 Bank Deposit

After the revenue has been verified, VECTOR provides a mechanism to automatically generate the forms necessary to deposit the revenue in a bank. An authorized user can select multiple verified revenue bags and process them for deposit. VECTOR will add up the values from the bags and generate a report showing the total revenue to be deposited along with bank deposit forms. The bags will then be eligible for reuse or retirement.

8.3.2 Toll Collector Financial Reconciliation

8.3.2.1 Collector Deposit

At the end of their TOD, Toll Collectors will have entered all their cash deposits into VECTOR. The audit and reconciliation process requires that the actual cash deposits be recorded to reconcile activities captured in VECTOR. When all coin and currency deposits are made, the system reconciles the record payments against the transactions recorded during the respective TOD. If a discrepancy is found, VECTOR will prompt the collector to recount and/or re-enter the counts. If the counts are re-entered incorrectly a second time, the system accepts the counts and the TOD auditor must analyze and adjust the counts. The discrepancy amount is never displayed to the Toll Collector.

8.3.2.2 Bank Deposit Information

The bank deposit functions support the automatic preparation of bank deposits (including bank deposit statements with grand totals) and allow for their reconciliation. In addition, authorized users can generate reports that aid in auditing and reconciling collector deposits.

8.3.2.3 Tour of Duty Audits

The system has electronically collected data that is used to identify the deposits that should have been entered during the Toll Collector's TOD. In reporting this amount, the system excludes non-cash items (i.e., for example, ETC transactions). The treadle counts and classification data associated with ETC transactions are separated in the reconciliation reports from those associated with cash transactions. All transactions are available for audit by the Toll Supervisor.

As with every functional area in the application software system, access to the TOD adjustment interface on the audit workstation is strictly controlled. The integrated toll audit features give comprehensive access to the following:

- ETC customer records
- Equipment maintenance history
- Unusual occurrence event records
- Bank deposit data
- Violation reports

Auditors have access to revenue and traffic records and statistics for all levels, from the lane to the entire system. The auditor can review both manual and electronic toll transactions to verify that the system and the toll collector are collecting the correct amount of money. Reconciliation reports, such as the Toll Collector TOD Report, are also available for instant on-line display and provide the auditor with immediate auditing capability.

Unlike other users, the auditor must have the ability to correct erroneous transactions, along with creation of the necessary audit trail. These adjustments are then automatically applied and the corresponding reconciliation of traffic to revenue is displayed for the auditor. Adjustments do not change the value of the original transaction; instead, they are additional transactions added to the original transaction to produce a net change in value. Auditors must provide a reason to adjust a given transaction to ensure accurate cross-checking reconciliation and to provide audit trails.

The auditor can make adjustments to the vehicle count for a particular collector and identify the reason for the adjustment. Adjustment can be made to the collector count, pre-class count, or post-class count of vehicles for a particular class and pay type. When the actual revenue and indicated vehicle classification by payment type are adjusted, an Audited Toll Collector TOD Report can be run and displayed to verify TOD balances.

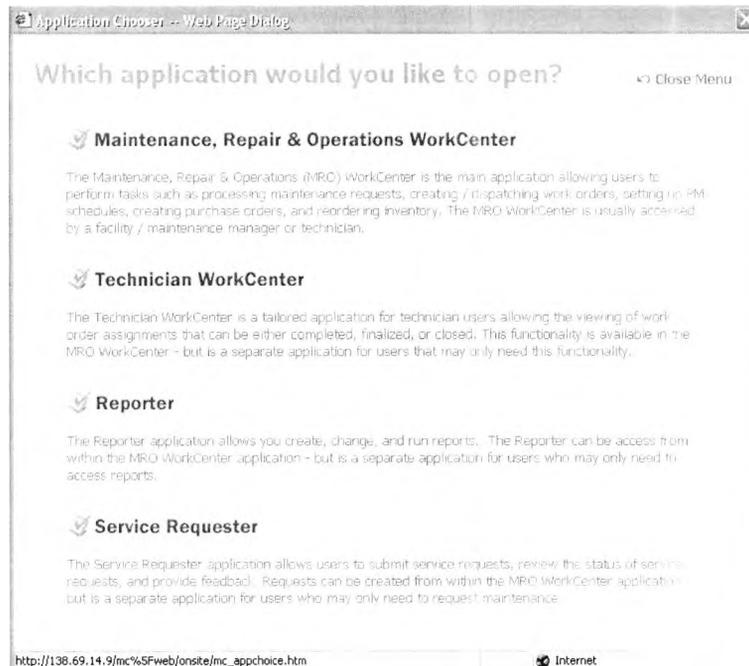
8.4 Computerized Maintenance Management System

The Vector_{Service} application is the automated system designed to provide a complete Computerized Maintenance Management System (CMMS) for the electronic toll collection system. Vector_{Service} consists of four main service modules working together to create a complete and comprehensive maintenance package. Each module is designed to provide the tools necessary for management and technical support personnel. The four main components of Vector_{Service} are as follows:



8.4.1 Maintenance, Repair, and Operations WorkCenter

The Maintenance, Repair and Operations (MRO) WorkCenter is the main application allowing users to perform tasks such as processing maintenance requests, creating / dispatching work orders, setting up Preventive Maintenance (PM) schedules, creating purchase orders and reordering inventory.



The MRO WorkCenter is accessed for the following:

8.4.2 Technician Center

The Technician WorkCenter is a tailored application designed for technicians to view and/or update work order assignments. This application enables technicians to complete, close, or finalize work orders remotely.

8.4.3 Reporter

The Reporter application allows authorized users to create, change and run reports.

8.4.4 Service Requester

The Service Requester application allows users to submit, review and provide feedback for service requests.

8.4.5 Monitoring Maintenance

The CMMS PC is connected to the network backbone, which means the information in CMMS is available to any personnel authorized on the network. CMMS continuously monitors the system for errors being sent from the LCMS. Errors are assigned a priority based on their severity. Table 34 shows examples of error prioritization.

Table 34 VECTOR CMMS Error Prioritization

Priority One	An error that will cause the loss of toll audit data - e. g. in the event of treadle failure, the reconciliation process is compromised - causes the CMMS to generate a service call and page the active or on-call technician.
Priority Two	An error that does not cause the loss of toll data, but requires repair the same day generates a service call in the CMMS.
Priority Three	An error that needs to be monitored or tracked for possible correction at a later date, generates a service call in the CMMS.

8.4.5.1 Maintenance Monitoring Functions

CMMS is a system made up of smart lane devices, interrogating lane software, and plaza filtering controls. The ETC system is constructed from various vendors and manufacturers providing the on-line diagnostics needed. By utilizing this hardware and software, CMMS provides near-autonomous maintenance functionality.

8.4.5.2 Maintenance Terminal

Through a maintenance terminal, CMMS allows a technician to monitor the current state of the LCMS. The technician can check the status of both the hardware and the system functions. Due to the nature of the system, there is no capability of running diagnostics on the LCMS when it is operating. The technician can test all devices when the lane is closed and the LCMS application software is stopped.

8.4.6 Controlling Product and Tracking Failure

Product control describes the procedures used to track inventory, including the methods used to evaluate, adjust, and replenish the level of inventory. Additionally, the minimum inventory level for a given part is discussed.

Failure tracking in CMMS is accomplished with the use of service calls. Each individual failure causes the generation of a service call through automatic or manual means. CMMS automatically generates a service call upon receipt of an error message from the LCMS.

Generally, maintenance can be considered to be efficient when the mean-time-between-failure (MTTR) meets or exceeds the projected values. Another general barometer of maintenance efficiency is whether the MTTR is near the projected value. While these are general guidelines, they are not absolute.

CMMS provides measures of maintenance efficiency that can be analyzed by both the workforce and technicians. MTBF, MTTR, response time, preventive maintenance completion percentage, and callback rate are reported monthly. If the problem is repaired the first time, then less time, energy, and materials are used. This also maximizes the system uptime.

8.4.6.1 Spares

To provide effective and efficient system maintenance, an adequate number of known good spare parts and assemblies must be maintained. One industry standard sparing level is ten percent of the module population or two, whichever is greater. The philosophy ensures that there are always at least two spare modules. If a failure occurs, one spare is used to correct the failure while one spare is still available for future failures.

In this distribution of spares ten percent sparing is a guideline. As more experience is gained with the system components, the recommended percentage can be adjusted up or down as needs dictate.

8.4.7 Controlling Inventory

Inventory control is achieved through the use of the CMMS.

The first steps toward inventory control are to take a complete physical inventory of all spare parts in the stockroom and to enter the results of the inventory into the parts inventory database. Once these initial steps have been completed the parts inventory resides in the parts inventory database.

When service calls are updated and closed, the parts used are entered on the fourth page of the service call entry screen. When the service call is closed, the parts used are automatically removed from the inventory.

As discussed above, when a receiving record on a purchase order is filled out, those parts received are automatically added to the CMMS parts inventory database. CMMS has a transfer inventory function that allows inventory to be transferred between various stock locations. For example, this function allows a part to be removed from the stockroom and entered into a technician's car stock. At a later date when the part is used, the car stock can then be adjusted.

The inventory transfer function has a flag for effective / defective. This flag allows a replaced part to be tagged as defective. It can then be tracked through the system.

CMMS has an inventory adjustment function that can be used to adjust inventory after a physical inventory has been performed. The results of the physical inventory and the data in the parts inventory report can be compared. Adjustments can be made if any inaccuracies appear between the two compilations of parts inventory.

All inventory transactions are entered into CMMS at the time of the transaction. As parts are taken into or out of the stockroom, inventory transfers are entered into the database. In this way CMMS maintains an up-to-date, real-time spare parts inventory.

The last component of inventory control is replenishment. Each record in the parts inventory database contains a field for the minimum quantity to keep on hand. As the inventory level drops below this threshold, a purchase order notification is generated.

The parts inventory is a real-time accurate inventory because of the use of the following functions:

- Receive equipment on a purchase order (PO)
- Transfer inventory
- Update a service call

8.4.8 Scheduling Technicians

The toll maintenance schedule for personnel of the ETC system is simple. Field Service Managers can modify the daily work assignments (schedule) in CMMS on a monthly basis. Plaza assignments and on-call assignments are also on the monthly calendar, which allows the field service manager to generate a schedule every month that includes the following:

- Which technician is working on any given day
- Which technician is assigned to which plaza on any given day
- Who is on call for which plaza on any given day

The toll maintenance schedule for operations is the Preventive Maintenance (PM) schedule. Recommendations are made in the monthly PM reports if an adjustment in PM frequency or procedure are necessary. For example, replacing a consumable item too soon or performing a procedure that causes wear more often than necessary.

9. Lane Controller Management Subsystem

9.1 Overview

The Lane Controller Management Subsystem (LCMS) provides the following key functions:

- Lane Mode Functionality

Home Agency toll facilities that have had the VECTOR lane system installed can operate in one of seven modes. These range from 'Closed' (No vehicle traffic at all) to 'Dedicated' ETC mode. The Toll Supervisor can transition a lane from one mode to any other mode as the need arises. When a lane is changed from one mode to another, it alters the type of vehicles that can travel through it, changes the customer feedback (signs, lights, etc), and enables/disables the violation equipment. The different lane modes are discussed in the following paragraphs.

- Lane Violations

For a lane violation to occur, the Lane Controller must determine from all the devices in the lane that a vehicle did not pay a toll, did not pay the correct toll, the vehicle was traveling beyond the speed threshold, or the device did not match the classification of the vehicle (device mismatch).

- Toll Collection

Toll Collection is the process of collecting payment (manual, electronic) for traveling on a bridge, toll road, or tunnel. The process usually begins with equipment recognizing that a vehicle has entered a lane, and the transaction is ended with the collection of some sort of payment.

9.2 Lane Mode Functionality

Lanes can operate in the following seven modes:

- Closed
- Detour (Pass-Thru)
- Standby
- Unattended (Dedicated)
- Unattended Open Road Tolling (ORT high speed lane)
- Unattended ORT/HOV (Open Road High Occupancy Vehicle lane)
- Attended

9.2.1 Closed Lane Mode

When a lane is closed, no vehicle can pass through without a violation transaction being initiated. The customer feedback devices will indicate that the lane is not open for business and the lane is not manned. Either the Toll Collector or Supervisor can close a lane.

9.2.2 Detour (Pass-Thru) Lane Mode

The Detour (Pass-Thru) Lane operating mode allows vehicles to pass through without a transaction of any kind being generated. This state can be used to relieve congestion by allowing vehicles to travel through one lane without stopping, but have them routed to a set of several lanes further down the road. There is no customer feedback that indicates that the lane is in detour mode, as this is an internal state, but the feedback devices can be configured to display Agency-specific messages. Only the Toll Supervisor can put a lane in detour mode.

9.2.3 Standby Lane Mode

The Standby mode allows a Toll Collector to temporarily shut down a lane while maintenance or some other activity that may slow the flow of traffic takes place. The customer feedback will be similar to that of the closed mode. Any vehicle that travels through the lane will initiate a violation transaction. The standby lane diverts traffic to adjacent lanes.

9.2.4 Unattended (Dedicated) Lane Mode

In a lane operating in dedicated mode, ETC equipment is used for the electronic collection of tolls, and no Toll Collector is on duty. This is the mode of operation that will permit the least impeded flow of traffic through a plaza. Feedback will indicate that the lane is for ETC customers only, and can display messages (customer-specific or general) to the motorists passing through the lane.

When a vehicle with a device enters the lane, the system automatically reads the information stored in the device and uses it to start an ETC transaction. VECTOR determines if the device is valid by comparing the information in the device with that provided by the TPMS and displays the appropriate

driver feedback. If the device is valid, an ETC transaction is initiated that will ultimately end with the toll being charged to the customer's account.

If the device is not valid, not found in the TPMS information, or is not detected in the vehicle, the system flags the transaction as being a violation and captures additional information (e.g., vehicle image) that will be passed back to TPMS (and VEMS) to be used in further processing.

9.2.5 Unattended ORT Lane Mode

In a lane operating in ORT mode, ETC equipment is used for the electronic collection of tolls, and no Toll Collector is on duty. Lanes designed for this mode are normally without booths or barriers so this is the mode of operation that will permit the least impeded flow of traffic through a plaza. Feedback will indicate that the lane is for ETC customers only. ORT lanes support generating transactions and violation data while allowing traffic to proceed at normal highway speeds.

9.2.6 Unattended ORT/HOV Lane Mode

In a lane operating in ORT/HOV mode, ETC equipment is used for the electronic collection of tolls, and no Toll Collector is on duty. Lanes designed for this mode are normally without booths or barriers so this is the mode of operation that will permit the least impeded flow of traffic through a plaza. Feedback will indicate that the lane is for ETC customers only. ORT/HOV will support the appropriate transaction processing for ETC, HOV, violation, hybrid, and non-revenue scenarios.

9.2.7 Attended Lane Mode

9.2.7.1 Mixed Mode

The Mixed mode allows the greatest flexibility to motorists. If they possess a device, they may utilize the lane as if it were in dedicated mode. For motorists that are not ETC customers, there is a collector manning the lane who can accept their payment for the toll. The feedback provided to the customer will indicate that the lane can be utilized by all motorists regardless of whether they are ETC customers or not. As the motorist exits the lane, a message can display ETC information (status, news, toll charged), an advertisement for the ETC system, or anything else that the Agency has pre-programmed in the lane application software. Note: the LCMS provides the user information for entering this exit information.

9.2.7.2 Manual Mode

In manual mode, the ETC transaction capability is suspended. A Toll Collector operates the lane and collects payment from every motorist. The system will classify and track the vehicles traveling through the lane and this information will be used to reconcile the transactions entered by the collector. Feedback devices will indicate to motorists that the system is not supporting the ETC devices and that a manual toll payment (cash, ticket) will be expected. The collector has the ability to identify a motorist as a violator and the necessary information will be captured and sent to the VEMS.

9.3 Lane Violations

9.3.1 Violation Detection (Entry & Exit)

There are four ways a vehicle can be classified as a lane violator:

- Class mismatch
- Speed
- Toll evasion.

The LCMS uses a sophisticated combination of hardware and software to identify motorists who violate on the lanes. The following is a full description of the violations.

9.3.1.1 Toll Evader

Two situations can cause a vehicle to be identified as a toll evader. If a motorist goes through a manned lane without paying, the Toll Collector can manually flag the transaction. LCMS will also identify a toll evader automatically, if a vehicle passes through a lane in dedicated mode without a valid device being detected.

9.3.1.2 Class Mismatch

There are two ways a transaction can be marked as a class mismatch violation – the Toll Collector categorizes the vehicle differently than the LCMS does; or the class type identified by the device in the vehicle is not the same as LCMS determines. An example of the second case would be if a vehicle has a device programmed for a passenger car installed in a three-axle truck.

9.3.1.3 Speed Violation

A speed violation occurs when a customer exceeds the established speed threshold of the lane. This threshold will be set by the Agency and monitored by the LCMS equipment. Any vehicle passing through the lane above the threshold will automatically be identified as a violator.

9.3.1.4 Lane Exception Warning

Certain lanes can be demarcated during specific times of the day for use by a restricted set of vehicle types. An example would be a bus-only lane. Customers who use these lanes with the wrong class of vehicle need to be reminded of the fact that they are not supposed to use those lanes.

9.3.2 Image Capture

License plate images are captured in the lane and matched with a violation transaction identifying the date, time, lane, and plaza. Any vehicle that passes through a lane that is identified as a violator for the cases described above will trigger the LCMS to capture one or more images. In addition, images will be taken if the device or customer account is identified as being in a bad status. Also, VECTOR TPMS, as part of its device status message to VECTOR LCMS (passed via their associated LPMS), can direct images to be captured regardless of other device, financial or lane violation status. The

images and transaction information will be sent to the VEMS (via the associated LPMS) for violation processing.

The lane takes a series of images (generally four to six), spaced in time, based on the sensed speed of the departing vehicle. The number of images and spacing normally guarantee that at least one image provides a good view of the rear license plate. Depending on the lane-imaging configuration, an additional image of the front license plate may be included in the images taken for specific transaction.

9.4 Toll Collection

ETC is the use of various technologies to allow the manual in-lane toll collection process to be automated in such a way that customers do not have to stop and pay cash at a tollbooth. With ETC, an actual toll plaza is not even a requirement to collect tolls. The ETC equipment can be mounted on overhead canopies and/or in the pavement, which allows vehicles to be charged while they proceed at highway speeds.

9.4.1 Lane Controller

The Lane Controller provides all of the logic and software functionality of the LCMS. It ties all of the lane hardware together along with the Toll Collector to create the start of the toll transaction process. It maintains the status of customer devices/accounts as provided by the TPMS via the LPMS, stores the transactions and images received from the lanes, and interfaces with its associated LPMS.

9.4.2 Collector Login Validation

A collector can log into the LCMS in one of two ways. The first method is by entering a valid username and password combination. The LCMS will validate the collector and grant or deny access as appropriate. The second method of logging into the system is to use an ID card. These methods can be used in conjunction or separately.

When a collector tries to login to the lane system using either method, the LCMS will send a validation request to the LPMS and proceed with the login process upon receiving permission. In the case of a communication failure between the two systems, the LCMS will allow the collector to login if the validation information is also maintained locally. This is an optional configuration that is selected by the Agency. The Toll Supervisor (through the LPMS) can override login attempts. In the event that the network communications are down and the information is not stored locally, the collector cannot login into the system. This process only logs the collector into the system. The lane will not be activated until the Toll Collector puts the mode in an operational state using the keyswitch.

9.4.3 Transaction Creation

Transactions are created the moment a vehicle is detected by the LCMS hardware. As information is gathered, it is associated with the transaction. The information may include anything from the Device number to the images captured. All transactions will be stored in the LCMS until they are sent to the LPMS for transfer to the TPMS for processing.

9.4.4 Vehicle Classification

LCMS uses sophisticated equipment to detect and classify a vehicle. There are several different types of hardware that provide both unique and complementary capabilities. By integrating them, VECTOR increases the effectiveness of the individuals. Vehicle classification is important to toll collection because Agencies typically charge different toll amounts to each major type of vehicle (motorcycle, car, truck, etc.).

9.4.5 Toll Collection

Toll Collection is the process of collecting tolls either manually or through ETC. The manual system incorporates the use of a touchscreen terminal as an essential part of the lane equipment.

9.4.6 Payment Mechanisms

VECTOR provides support for payments made electronically, by cash, and by tickets. LCMS also supports the use of automated coin machines. These different methods can be used independently or in combination in each lane.

9.4.7 Lane Status Messages

The LCMS continuously monitors the status of its equipment and periodically informs the LPMS by way of status messages. This feature increases the effectiveness of the MOMS and the reliability of the system. When the LPMS is notified that a lane has degraded, the Toll Supervisor can quickly take action to correct, report, and/or close the lane.

9.4.8 Speed Measurement

The hardware used in the LCMS can provide the speed of the vehicle as it passes through the lane. This can be used to implement speed violation functionality. It can also be used to provide feedback to the motorist that they are exceeding the safe speed of the lane. The speed measured is also used to properly trigger the VES cameras (where installed) to capture license plate images for violation processing. As previously discussed, the speed measurement is also used to space the images taken when image collection is operating.

9.4.9 Data Exchange

The LCMS exchanges data with the TPMS and provides information to the LPMS. LCMS sends transaction information to the TPMS and receives customer tag and account information. LPMS receives Toll Collector and lane status information from the LCMS. The LCMS also provides



information to the customer by the use of message boards and lights. Items such as customer account status, device, and a limited set of text messages can be provided to motorists.

9.4.10 Lane Hardware Configuration

VECTOR supports several types of lane equipment that can be combined in a variety of configurations. Each piece is integrated into a cohesive system that provides the functionality necessary to support ETC. As mentioned above, the status of each piece of equipment is monitored and provided to the LPMS. This will alert the Toll Supervisor that the lane equipment has failed, or by tracking it over a period of time, has degraded and is in need of realignment or some other form of maintenance.



10. Additional Systems

10.1 Overview

VECTOR interfaces with various systems and devices that are packaged as part of the integrated services provided. This section provides information on the features and capabilities of those additional integrated systems and devices. Systems included in this section are listed below:

- Internet (Web) Interface
- VRS
- Automated Check Reader (DP500)
- Device Programmer
- Kofax CD Jukebox
- Verifone Credit Card Reader
- TIMS
- ClearCommerce for Payment Processing

10.2 Internet (Web) Interface

Customers employ an Internet Web Browser and Internet connection to access the VECTOR Web Interface main page either directly or through hyperlinks from web pages maintained by their Home Agencies. Users without passwords are limited to obtaining information about the Agency and toll programs and to opening an account. Users already having an account and who received a password may logon and access all of the other features provided.

After users have entered their account number and password, the VECTOR Web Interface verifies they are a valid user and sets their information access level. Customers may only view information concerning their accounts. Users do not interact directly with the VECTOR system and database. Instead, all interactions are directed through the Web Interface software, thereby providing more security for the main VECTOR system.

The VECTOR Web Interface accesses the data associated with a given VECTOR CSC. Since each CSC services different Agencies, the look and feel and functionality of the Web Interface is customizable to suit each Agency. This said, however, the VECTOR Web Interface supports the functions listed below. Follow on discussions describe each of the features in more detail.

VECTOR Web Interface Functions:

- Open a new account
- Log On with account number and password
- View account information
- View account history
- View archived statements
- Update personal information
- Maintain vehicle and device Information
- View violation information
- Make payments
- Request to be mailed their customer profile (includes their password)

While the VECTOR system supports the Web Interface, implementation of the Web Interface for use by an Agency's customers is at the discretion of each Agency.

10.2.1 Open a New Account

A user, including a first time user, is taken through a three-step process to establish an account. First they must select an account type (Web-based enrollment is limited to individual/Private or Business accounts only). Second, they are asked to review the descriptions of the different discount plans offered by the device-issuing agency and decide on the plan that best meets their needs. Finally, they are asked to fill out and submit the application and agree to the Terms and Conditions. They may opt to either complete the application online, to download and print the application for mailing, or to email a request to receive an application in the mail. To aid in their plan selection, users can look up



participating Agencies and their toll facilities, as well as link directly to participating Agency web sites.

10.2.2 View Account Information

For the entered account, a user can view the following account information:

- Account balance and status
- Account contact information (address, day phone, evening phone)
- Last account replenishment (method, amount, card number and date)
- Last three toll transactions (date, device, entry plaza and lane)
- Commuter Plan status concerning trips taken (device, plan, trips used and left, start and end date)

10.2.3 View Account History

For the entered account, a user can view the account history information listed below (see Section 2 for a description of each account history type). While the amount of information displayed is selectable by an Agency, the typical history displays the last 50 transactions sorted by the date and time the transactions were captured in the lane.

- Toll transaction history (date, device, devices per account, entry plaza/lane, exit plaza/lane, status, toll amount and posting date)
- Financial transaction history (date, description, payment type, amount, any adjustments made and a reference number to identify the payment)
- Non-financial transaction history (transaction date and description of the transaction such as change of address, change of rebill information, etc.)
- The last 3 years of account statements can be viewed, emailed or printed from the Account History screen.

10.2.4 Update Personal Information

For the entered account, a user can view and edit the following personal information:

- Contact information (address and day/evening telephone numbers)
- Credit card expiration date for customers who have selected credit card replenishment)
- Web Interface password (allows users to change their password)
- Statement delivery (allows users to select statement periodicity and delivery method, including changing their email address for statement delivery)

10.2.5 Maintain Vehicle and Device Information

For the entered account, a user can view and edit the following vehicle and device information:



- Change information concerning vehicles associated with the account (license plate number, state, country, make, model, year, whether vehicle has a metal-oxide windshield and the vehicle's IAG vehicle type code)
- Add new vehicles to the account (same information as for changing vehicle information)
- Report as lost or stolen a device associated with the account and request a replacement
- Request additional devices (identifying specific subaccount to use the device, the IAG code of the vehicle it will be installed in and the type of device mount).

10.2.6 View Violation Information

For the entered account, a user (either a customer or a non-customer) can view information about violations reported against the account. Information displayed includes the violation number, status, license plate number, plaza/lane at which the violation occurred, time of the violation, the amount owed for the violation (separately lists administrative fee, toll amount and total amount).

10.2.7 Make Violation Payments

The VECTOR Web interface has the capability to allow customers to make payments for specific violations, or for all violations pending, using the credit card they have on file.

10.2.8 Email Confirmation

The VECTOR Web interface will provide users with an emailed, printable confirmation or receipt following account establishment, account changes or online payments; Email customer profile upon request.

10.2.9 Account Closure Request

For the entered account, a user can request to close the existing account/s.

10.2.10 E-ZPass "On the Go"

The E-ZPass "On the Go" Solution provides customers with the added value of purchasing an active tag from retail outlets that may be immediately used at MdTA and all other IAG facilities. The benefit of expanding tag inventory distribution channels to include retail operations promotes the concept of greater flexibility in *self-service* and enhances E-ZPass market penetration. First this concept is achieved by reaching those busy customers who want to have the *convenience* of purchasing a usable tag right off the shelf. Secondly, retaining those customers and encouraging enrollment through the registration process will add to the existing account and revenue base of E-ZPass.

10.3 VRS

A user may access the VRS through two different paths: They can dial the direct VRS number or be redirected to the VRS by a CSR at a VECTOR CSC. Users who call a VECTOR CSC are prescreened for the help they need and may opt to be redirected to the VRS where possible to expedite their service.

Users interact with the VRS using their telephone's touch-tone keypad, receiving computer generated and prerecorded voice responses based on their inputs. As with the Web interface, users without PINs may only access those services associated with requesting an application, information on location and hours of operation. Users with PINs will be asked to enter their PINs prior to providing account-related information. (Note, Agency's may elect to allow their callers to get their account balance without a PIN, while requiring that they enter their PIN for all other functions).

As with the Web Interface, access to the VECTOR system or its database is through the software of the VRS. The VRS does access the database for account-specific information.

Although VECTOR fully supports the VRS interface, implementation of a VRS for customer use is at the discretion of an Agency.

VRS Functions:

- Hear Account Information
- Update Personal Information
- Maintain Vehicle and Device Information
- Hear Violation Information

10.3.1 Hear General Program Information

A user can hear the following general information concerning operations of the toll system:

- Locations of Customer Service Centers they may use
- Mailing address and directions to CSC
- Hours of operation of the CSC
- Information on the Discount Plans offered by the Agency which issued the customer's device
- Assistance with filling out an application

10.3.2 Maintain Account Information

For the entered account, a user can hear/enter the following account information:

- Hear their account balance
- Hear the details of their last account replenishment

- Hear the number of trips taken in a discount plan's current period
- Hear and alter the Commuter Plan suspension status
- Request that an account application be faxed or mailed (includes entry of home telephone number from which an address is obtained for mailing)

10.3.3 Update Personal Information

For the entered account, a user can hear and edit the following personal information:

- Credit card expiration date (for customers who have selected credit card replenishment)
- VRS account PIN (allows users to change their PIN)

10.3.4 Maintain Vehicle and Device Information

For the entered account, a user can hear and edit the following vehicle and device information:

- Report as lost or stolen a device associated with the account
- Request additional devices (individual/Private accounts only)

10.3.5 Hear Violation Information

For the entered account, a user can hear information about violations reported against the account, including those listed below. Additionally, information recordings are available to describe how the customer may pay for violation and how the customer can check status using the Web Interface.

- Violation status
- Violation balance
- Information on notices and appeals

10.4 Automated Check Reader (DP-500)

As the number of customers rise for a given Agency, a point is reached where the volume of checks received is better handled through an automated check reader. To support an increased check processing volume, VECTOR supports an electronic interface with a DP-500 check reader which speeds entry of payment information received via check.

The DP500 scans the check to determine the sender's bank and account number. The DP500 also uses built in OCR and MICR capability to read the check amount. Following a "run" of batch of checks through the DP500, a CSR will manually total the checks and compare the total with the DP500 as a means for detecting possible DP500 processing errors. In those rare instances where the DP500 cannot read the check amount, a CSR will manually correct the misread DP500 amount.

An interface between the DP500 and VECTOR transfers the DP500 data to the VECTOR Financial Payment Management Subsystem (FPMS) for posting to the customer's account, following the cross-check previously discussed.

Use of the DP500 significantly speeds check processing and reduces entry errors while providing a built in auditing run for supervisor audits of inputs.

10.5 Device Programmer

CSR's employ a device programmer to check devices received from the manufacturer for proper operation and for recoding the device prior to issuance to customers. While the programmer is capable of recoding all stored data onto the device, IAG business rules limit VECTOR operation to coding only the vehicle's class.

A VECTOR interface is provided in the DIMS to semi-automate device checks during the DIMS process for assigning devices to customer accounts. In this use, VECTOR interfaces with the programmer to pass the codes to be programmed into the device based on the device type and class requested by the customer previously entered into VECTOR.

10.6 Kofax CD Jukebox

VECTOR employs a read/write CD jukebox system for storing both violation images and images of notices/correspondence. While various sizes of JukeBoxes may be interfaced with VECTOR, a typical system includes ten read/write drives and an integral, computer-controlled archive of 128 disks. An image request (either a read or a save) from VECTOR is handled by the Jukebox directory to locate the desired image on one of the system disks, which the Jukebox system then swaps into one of the ten read/write drives to retrieve the image.

The Kofax Jukebox also handles creation of periodic backup CD's that are generated for each system, and archive CD's for disaster recovery purposes.

10.7 Verifone Credit Card Reader

VECTOR interfaces with a credit reader for automatically obtaining credit card information. CSR's at walk-in CSC swipe a customer's credit card in the Verifone. The Verifone reads the card's encoded magnetic strip to obtain the Credit Card Number, Expiration Date and Authorization Code, which it passes to VECTOR. VECTOR then populates the appropriate fields in the customer's demographic information. Alternatively, the CSR may manually enter the customer's credit card number and expiration date into the VECTOR account maintenance screen.

10.8 TIMS

TIMS is another ACS system, independent of VECTOR that interfaces with the Department of Motor Vehicles of all 50 states and most Canadian Provinces. VECTOR daily sends TIMS a file containing the license plate numbers and states that the VEMS of VECTOR desires appropriate DMV's to lookup to obtain mailing addresses for violators.

TIMS aggregates VECTOR's request with those of other Service Centers and other users and prepares one file for each state to which lookup requests will be sent. TIMS then handles the formatting of the lookup request and delivery of the request (each state has a different format and delivery methodology). When the DMV's respond, TIMS translates their varying response formats into a single format that it relays back to VECTOR.

The overall process from request to response could take several days, depending on the state. For example, some states require that TIMS cut a tape that is manually delivered for processing.

10.9 ClearCommerce for Payment Processing

VECTOR interfaces with the ClearCommerce engine by the ClearCommerce Corporation to ensure customer payments are processed quickly, whether purchases take place online, through a call center or as a wireless transaction.

The ClearCommerce engine, integrated with VECTOR, provides VECTOR customer's with the flexibility to make payments on their accounts using all major credit cards, debit cards including Visa Check cards and Switch and Solo cards, on-line debit cards from SafeDebit, electronic checks and automated clearing house (ACH) payments. With ClearCommerce, VECTOR provides real-time payment processing to its customers including the following features:

- Interface with major payment processors to authorize transactions in real-time,
- Screening out of fraudulent payments,
- Immediate payment confirmation to the customer (via email),
- Simultaneous processing of multiple transactions on one server (speed), and
- Partial payment support.

The ClearCommerce engine provides VECTOR with an integrated fraud management solution that integrates client (merchant) business rules, neural networks, IP location, service data, and human review into an efficient solution tailored to customers' needs and clients' business practices. ClearCommerce enables VECTOR client's to define real-time transaction screening rules that incorporate six layers of fraud detection and management that enables VECTOR clients to alert, accept or reject a payment based on the fraud rule triggered:

- Automatic lock outs,
- Negative and positive lists,
- Client (merchant) rules,
- FraudAnalyzer neural-network risk scoring,
- GeoLocator IP location, and
- Integration with external security and risk services.

10.10 Customer Relationship Management

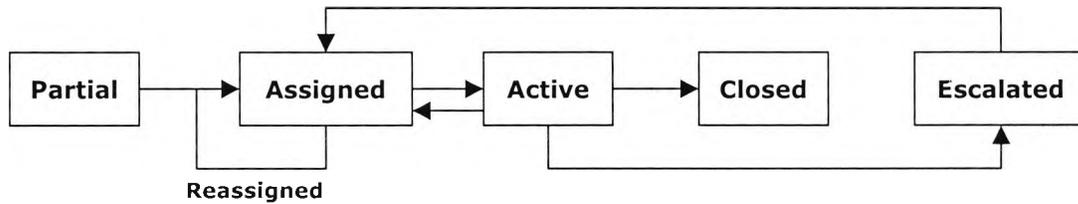
The Customer Relationship Management (CRM) module will create batches of 25 web queries with the same category to assign to the CSRs. These batches will be assigned automatically; based on CSR queues. The Supervisor can also manually assign these batches to CSRs. Only one CSR can work on a batch at any given time.

Batches will have the following statuses:

- Partial: These are batches that are not complete (i.e. they have fewer than 25 queries).
- Assigned: These are batches that have 25 queries and are assigned to a CSR.
- Active: These are batches that are being worked upon by CSRs.
- Closed: These are batches that have been resolved (all 25 queries have been answered).
- Escalated: these are batches that have queries that were escalated by the CSR assigned to the batch. These batches will be closed when all the queries have been answered.



A representation of batch status transitions is depicted in the figure below:



10.10.1 Functional Changes for the CSR CRM in VECTOR 2.21

The CRM window will include all current design elements (buttons, functionalities and aesthetics). The CSR will be able to perform the functions using the CSR CRM screen:

1. The CSR will be able to view the batches assigned to him/her. The CSR will have read-only privileges for this batch listing. These assigned batches will be sorted from the oldest to the newest based on the assigning time. The CSR will have the ability to sort these queues by batch status; batch category and the batch assign date.
2. Within each batch the CSR will be able to view the complete set of 25 queries and will be able to sort them by receive date, status, account number and email address.
3. The CSR will, similar to the current CRM module, be able to open, escalate and discard any response in the batch. Also, similar to the current CRM module, the CSR will have the option to view the account's demographic information (from the query request).
4. The CSR will be able to select only the pre-defined (canned) responses. The CSR will not have the ability to modify the text or attachments in the canned responses.

10.10.2 Functional Changes for the CSR Supervisor CRM in VECTOR 2.21

With the addition of batches and assignments the role of a CRM supervisor will become more complex. The supervisor will be able to perform the following functions using the CSR Supervisor CRM Screen(s):

1. The CRM Supervisor will have the capability to search all batches or responses by query category, status, account number, email address, date range or by employee ID.
2. These batches (output from the search) will be sorted from the oldest to the newest based on the assigning time. The supervisor will have the ability to sort these queues by batch status; batch category and the batch assign date.

3. Within each batch the supervisor will be able to view the complete set of 25 queries and will be able to sort them by receive date, status, account number and email address.
4. The major difference between the supervisory role as compared to the CSR role will be the fact that the supervisor will have the authority to assign batches manually to CSRs.
5. The supervisor will, similar to the current CRM module, be able to open, escalate and discard any response in the batch. Also, similar to the current CRM module, the supervisor will have the option to view the account's demographic information (from the query request).
6. The supervisor will have the ability to select canned responses. The supervisor, unlike the CSR, can modify the text in the responses. The supervisor will be able to save and return to any unfinished responses in the active batch.
7. The supervisor will also be able to modify the category for any query before assignment to the CSR.
8. The Vector CRM system will also report on the total number of partial, assigned and escalated batches at any given time.
9. The CRM module provides functionality for Activity Based Compensation (ABC) that allows for compensating CSRs by requests processed. The VECTOR CRM system will also report the total number of requests closed each day. For the purpose of this module a day will be considered from 00:01 hrs to 24:00 hrs.
10. The CSR Supervisor will also have the ability to update the text, category or description for any canned messages available to the CSRs and add attachments to canned responses in the VECTOR CRM module.

10.10.3 Reporting Changes for the CRM in VECTOR 2.21

In support of an ABC initiative, report functionality has been added that focuses primarily on tracking the responses for each CSR. The report will have a detail and summary section. The input parameters for the report will be the following:

1. From/To Date (defaults to current day)
2. Employee ID (defaults to ALL)
3. Status (defaults to ALL)

The detail section of the report will have the following info:

1. Employee ID
2. Batch ID
3. Batch Start time
4. Batch End Time
5. Batch Status
6. Batch Category
7. Batch Count



The summary section of the report will have the following info:

1. Employee ID
2. Date
3. Responses
4. Category
5. Count



11. Internal and External Interfaces

11.1 Internal

VECTOR subsystems are highly integrated to perform effectively and efficiently. Table 35 below depicts the relationship between VECTOR subsystems. The 'X' indicates a relationship exists. The text following the picture describes the interface between each subsystem.

Table 35 Relationship between VECTOR subsystems

	CAMS	DIMS	TPMS	FPMS	VEMS	SAMS	LPMS	LCMS
CAMS		X	X	X	X			
DIMS	X							
TPMS	X				X		X	
FPMS	X						X	
VEMS	X		X				X	
SAMS							X	
LPMS			X	X	X	X		X
LCMS							X	

11.1.1 CAMS and DIMS Interface

The CAMS relies on the DIMS to provide the support necessary for the fulfillment of device requests, status tracking, and other device inventory-related functions. Requests for both initial and additional devices are initiated through the CAMS, but are actually fulfilled in the DIMS. Additionally, device physical status information is provided to CAMS from DIMS.

11.1.2 CAMS and TPMS Interface

TPMS provides the toll and violation transactions to CAMS to be posted to customer accounts. CAMS provides TPMS with the device and account status needed by TPMS to determine appropriate fees to charge and other actions to take when processing transactions it receives from LPMS.

11.1.3 CAMS and FPMS Interface

All of the financial transactions generated in the CAMS are actually executed in the FPMS. For example, a cash customer walks into a CSC and requests an additional device. Based on the Agency's business rules, they are required to provide a deposit before they can receive the new device. When the customer gives the CSR the necessary deposit amount, the transaction is captured in CAMS but the FPMS actually applies the money towards the customer's account. In short, the CAMS initiates and displays the customer's financial transactions, but it is the FPMS that actually processes them. FPMS also provides CAMS with information concerning the funds collected by CSR's for use in TOD audits at the end of a CSR's shift.

11.1.4 CAMS and VEMS Interface

CAMS relies upon the VEMS to process customer and non-customer violations. Because these types of transactions can affect the customer's account, CAMS and VEMS exchange customer information. When a customer commits a violation, the VEMS associates the transaction with the customer's account and can suspend or apply a financial penalty to the customer. The customer can contact a CSR and determine the steps necessary to rectify the issue. Using the CAMS functionality (via the FPMS as previously discussed), the CSR can accept a violation payment or perform some other type of action. This information will be sent back to the VEMS that may, depending on the violation, restore the customer's account status.

11.1.5 TPMS and VEMS Interface

The TPMS sorts the new incoming transactions from the LPMS to determine what type they are. All violation transactions are sent to the VEMS for further processing. VEMS processes the violation transactions and provides a status back to the TPMS, including those violation transactions, which are postable to customer accounts. This provides the TPMS with the information necessary to properly track the status of all transactions.

11.1.6 TPMS and LPMS Interface

The TPMS sends the customer (Home and Away) account/device information to its associated LPMS's for transmittal to their associated LCMS's (lanes) so that the lanes can identify violators and provide feedback to the customer as to their account status. In return, LPMS's provide all transaction information to TPMS that they receive from their associated LCMS's so that it can be properly processed.

11.1.7 FPMS and LPMS Interface

FPMS tracks and records the financial activities that occurred at LPMS by Toll Collectors. FPMS tracks the revenue bags assigned to the Toll Collectors. All the lane transactions forwarded by LPMS (revenue bag deposit, bank deposit) are processed using FPMS. In return FPMS provides LPMS with information for auditing the funds collected by Toll Collectors, including traceability to individual bank deposit bags.

11.1.8 VEMS and LPMS Interface

The VEMS accepts violator images from LPMS (forwarded from their LCMS). Multiple images from a single violation transaction are supported.

11.1.9 LPMS and SAMS Interface

SAMS is used to enter the Fee Rate Schedules for each of the lanes associated with VECTOR (both internal and external). Once entered, each LPMS draws the information down and passes it to their LCMS' (lanes). SAMS is also used to add or edit lane, plaza, and facility information and to enter personnel authorized to use different functionality of the system.

11.1.10 LPMS and LCMS Interface

LCMS sends status information regarding the hardware as well as, the lane mode. It also provides transaction information so that the Toll Supervisor can monitor them in real time. LCMS accepts commands from the LPMS to switch modes and to allow Toll Collectors to log in. LPMS also acts as the communication conduit for LCMS to TPMS and VEMS communications. In this capacity, LPMS receives and forwards transactions to the TPMS, and violation images to the VEMS. In return, TPMS receives device status from the TPMS and forwards it to its LCMS's.

11.2 External

VECTOR subsystems interface with external entities and organizations.

Table 36 below depicts the relationship between a VECTOR subsystem (identified as column headings) and external entities. If a cell located underneath a subsystem column is blank, there is no relationship between that subsystem and the entity listed in the far left column. The text following the table describes the relationship between the two entities.



Table 36 Relationship between a VECTOR subsystem and external entities

	CAMS	DIMS	TPMS	FPMS	VEMS	SAMS	LPMS	LCMS
CSR	X	X			X	X	X	X
WEB	X			X				
VRS	X							
Home Agency			X		X			
Reciprocal Agency			X		X			
CC Processor				X				
Mail House	X				X			
Customer	X				X			X
Non-Customer					X			
DMV					X			
Collection Agency					X			

11.2.1 Customer Service Representative

11.2.1.1 CAMS

The CSR interacts with the CAMS through a GUI. In this manner, a CSR can perform all of the functions described in this document. This is the primary interface between the system and the customer.

11.2.1.2 DIMS

The CSR interacts with DIMS to perform all of the functions described in this manual.

11.2.1.3 VEMS

The interface to the CSR from VEMS is through the VECTOR GUI.

11.2.1.4 SAMS

The Customer Service Supervisor or Administrator interfaces with SAMS to load and view employee, plaza and service center information as documented in this manual.

11.2.1.5 LPMS

With respect to LPMS, the CSR is defined as the Toll Collector. The Toll Collector interacts with the LPMS through a GUI and software applications external to VECTOR. In this manner, a Toll Collector can perform all of the functions described in this document.

11.2.1.6 LCMS

With respect to LPMS, the CSR is defined as the Toll Collector. The Toll Collector interacts with the LPMS through a GUI and software applications external to VECTOR. In this manner, a Toll Collector can perform all of the functions described in this document.

11.2.2 Web Browser

11.2.2.1 CAMS

VECTOR provides an interface for some of the CAMS functions. Users can update and obtain information about their accounts (current balance, latest replenishments, and recent tolls). The subset of functions that are provided through the web is somewhat configurable by the Agency.

11.2.2.2 FPMS

VECTOR interfaces with FPMS by allowing the user to establish a credit card account via the web.

11.2.2.3 Retail Tag Sales E-ZPass "On the Go"

E-ZPass "On the Go" provides a web interface allowing access to account information for CSR's, new and existing customer account holders and retailers providing additional outlets for new E-ZPass device sales. The following is an overview of the functionality for each of the intended E-ZPass "On the Go" users.

- **Customer Account Reps:** CSR's can access the web interface to perform maintenance on tag sales to retail accounts. Maintenance includes: processing new tag orders for retail customers, track retail tag orders and cancel orders when required. Additionally CSR's can manage retailer information and view information history for retail tag sales.
- **Retail Customer Accounts:** Retailers have the ability to place new tag orders and view past and present orders within the system.
- **Account Holders:** Current E-ZPass account holders can access this web interface to manage and view account information.
- **New Customers:** E-ZPass "On the Go" provides an online resource for new customers to create new accounts and access information about E-ZPass quickly and easily

11.2.3 Voice Response System

11.2.3.1 CAMS

VECTOR provides an interface between the VRS software and the customer account information stored in the system. Customers can access the VRS via their telephones to make inquiries and perform other transactions as supported by the VRS software application.

11.2.4 Home Agency

11.2.4.1 TPMS

The TPMS has the capability to interface with non-VECTOR LCMS. It will accept transactions from these external Home Agency lanes and process them as if they were from the VECTOR LCMS. In addition, TPMS provides these external systems with the same information that it provides to the VECTOR LCMS. Manual toll log information is provided by the Home Agency and entered into the system so that these transactions may be processed. TPMS also provides the Home Agency with all transaction reconciliation information so that the Home Agency is aware of the lane activity and the transaction processing information.

11.2.4.2 VEMS

VEMS provides several interfaces to the Home Agency. A limited GUI is provided to support speed adjudication. In addition to accepting violation images directly from the Lanes subsystem, VEMS can also accept them from the Home Agency. If desired, VEMS can provide information regarding rejected images from the review process. VEMS also provides an interface that will allow the Home Agency to receive the lane transaction information and return the violator's license plate information and/or vehicle class.

11.2.5 Reciprocal Agency

11.2.5.1 TPMS

The TPMS is the interface between VECTOR and all reciprocal agencies. It exchanges customer information (i.e., customer device status, license plate information), transaction, and reconciliation to the other agencies and accepts the same in return.

11.2.5.2 VEMS

All violation information transferred to and from IAG Agencies goes through the VEMS.

11.2.6 Credit Card Processor

11.2.6.1 FPMS

FPMS interfaces with a credit card processor to receive credit card authorizations. FPMS sends a request for authorization to the credit card processor. In turn, the processor declines or approves the request. If approved, FPMS sends a settlement statement to the credit card processor. Payment can also set up through ACH debit using the customers bank routing and account number.

11.2.7 Mail house

11.2.7.1 CAMS

The CSC utilizes the services of a commercial mailing house to prepare and send out customer notices, letters, statements, and promotions. The account information is provided to the mailing house that formats it and puts the Agency information on the correspondence.

11.2.7.2 VEMS

VEMS does not issue notices itself. Rather it is designed to interface to an Automated Data Mail house. It sends notice information that will be printed and mailed to violators. Escalation information can also be sent to the ADM for customer noticing. The ADM will return information back to VEMS regarding the disposition of the notices (date mailed, etc.) that can be used in further violation processing.

11.2.8 Customer

11.2.8.1 CAMS

The customer interacts with the CAMS either through a CSR, the VRS, or the web interface. There is no support for a GUI that will allow the customer direct access to the system.

11.2.8.2 VEMS

The only direct interface with the customer from VEMS is the mailing of Violation Notices.

11.2.8.3 LCMS

The LCMS provides information to the customer regarding their account status through the use of lights and/or message display boards. It also uses hardware to accept the device and vehicle information as the customer passes through the lane.

11.2.9 Non-Customer

11.2.9.1 VEMS

VEMS interfaces with non-customers by obtaining their vehicle information from DMV and then mailing a notice to the non-customer for payment.

11.2.10 DMV

11.2.10.1 VEMS

To obtain the violator's information based on a license plate capture, VEMS sends a request to a state DMV. VEMS then receives motorist information from the DMV. The Agency must have an agreement with each state DMV that it wishes to obtain information from.

11.2.11 Collection Agency

11.2.11.1 VEMS

If implemented, VEMS can send violator (and transaction) information to a collection agency. If the status of the collection action changes, either VEMS or the agency can send updated information. If the collection agency resolves the issue, it sends the relevant information to VEMS.

Acronyms & Abbreviations

ACH	Automated Clearing House
ADM	Administrative Data Mailhouse
ATP	Automatic Transaction Posting
AVC	Automatic Vehicle Classification
AVI	Automatic Vehicle Identification
CAMS	Customer Account Management Subsystem
CC	Credit Card
CLMM	Class Mismatch
CMMS	Computerized Maintenance Management System
CSC	Customer Service Center
CSR	Customer Service Representative
CTOL	Casual Toll
DIMS	Device Inventory Management Subsystem
DMV	Department of Motor Vehicles
DISC	Discarded transactions (from Unmatched Handler)
EPH	Electronic Plaza Host
ETC	Electronic Toll Collection
ETOL	Electronic Toll
EXT	Exterior
FDD	Functional Description Document
FNDX	IAG Facility Operator Distribution Interface File
FNRX	IAG Facility Operator Reconciliation Interface File
FNTX	IAG Facility Operator Transaction Interface File
FPMS	Financial Processing Management Subsystem
FRXN	IAG Facility Operator Reconciliation Correction Interface File
FTAG	IAG Facility Operator Device Status Interface File
FTOL	Facility Operator Toll
FTXN	IAG Facility Operator Transaction Correction Interface File
FTP	File Transfer Protocol
GUI	Graphical User Interface



HOV	High Occupancy Vehicle
IAG	Inter-Agency Group
ICLP	IAG License Plate Interface File
ICRX	IAG Toll Reconciliation Interface File
ICTX	IAG Toll Transaction Interface File
ID	Identification
IITC	IAG Invalid Device Interface File
INRX	IAG Non-Toll Reconciliation Interface File
INT	Interior
INRX	IAG Non-Toll Reconciliation Interface File
INTX	IAG Non-Toll Transaction Interface File
IRXC	IAG Toll Correction Reconciliation Interface File
IRXN	IAG Non-Toll Reconciliation Correction Interface File
ITAG	IAG Device Status File
ITGU	IAG Device Status Update File
ITOL	Image Toll (violation toll after image review)
ITXC	IAG Transaction Correction Interface File
LCMS	Lane Controller Management Subsystem
LPMS	Lane/Plaza Management Subsystem
MOU	Memorandum Of Understanding
MTBF	Mean Time Between Failures
MTOL	Manual Toll
MTTR	Mean Time To Repair
MVA	Motor Vehicle Administration
NSF	Non-Sufficient Funds
NOL	Notice Of Liability
NPST	Not Posted
NSF	Non-Sufficient Funds
ORT	Open Road tolling
PC	Personal Computer
PDR	Payment Detail Report
PIN	Personal Identification Number
PM	Preventative Maintenance
PO	Purchase Order
POI	Point of Issuance



REJC	Rejected transactions
SAMS	System Administration Management Subsystem
TE	Toll Evasion
TIMS	Transportation Information Management System
TOD	Tour of Duty
TOR	Transfer of Responsibility
TPMS	Transaction Processing Management Subsystem
TSC	Transportation Service Center
UCTX	Unmatched Handler toll transactions for inclusion in ICTX file
UNMA	Unmatched transactions for the Unmatched Handler
UNTX	Unmatched Handler non-toll transactions for inclusion in INTX file
UTOL	Unmatched Handler Toll
VCTX	Violations tolls for inclusion in ICTX file
VECTOR	Violation Enforcement Customer Service Toll Operations Reporting
VEMS	Violation Enforcement Management Subsystem
VES	Video Enforcement System
VIOL	Violation Toll
VRS	Voice Response System
VTOL	Violation Toll (before image review)
YTD	Year-to-Date



Glossary of Terms

Agency	A generic term used to identify an organization that implements Electronic Toll Collection (ETC).
Away Agency	A term used to distinguish an agency that a customer does not belong to, but is using their facilities.
Business Account	An account that can support more than four tags. Generally used by companies with a large number of vehicles. Tolls are pre-paid.
Collection Agency	A collection agency collects all overdue funds for the CSC.
Commercial Account	An account similar to a business account but the tolls are post-paid.
Credit Card (CC) Processor	The CC Processor is utilized to transfer funds from a customer's charge card to the CSC's bank account.
Customer Service Center (CSC)	A physical location that services the needs of the toll customers. It also implements the 'back office' processing of VECTOR.
Customer Service Representative (CSR)	Person who works at a CSC. They comprise the bulk of the VECTOR users.
Device	See description for Tag.
Facility	The location where the vehicles actually pass through lanes and start the ETC process. Usually consists of multiple lanes operated by a plaza/host.
Home Agency	A term used to distinguish the agency that a customer belongs to (the agency with whom they have an account).
Host Agency	A term used to distinguish the agency that is administratively supporting a non-toll Facility Operator and their facilities. The Host Agency is responsible for integrating its associated non-toll facilities into the integrated, IAG-run toll system.

Inter-Agency Group (IAG)	A consortium of toll agencies that implement reciprocity and examine issues that relate to inter-agency interactions.
Mailhouse	A mailhouse prepares and sends out customer notices, letters, statements, and promotions on behalf of the CSC.
Non-Revenue Account	An account that does not pay for the use of ETC lanes. Typically used for agency and government employees. Examples are police, fire and rescue vehicles, etc.
Private Account	An account that generally belongs to a single person or family. Up to four tags may be assigned to a private account.
Proxy Deposit	A deposit that that is created on behalf of another employee.
Reciprocity	An agreement between agencies whereby the customers of one agency can use the facilities the others. Implemented by exchanging customer and transaction information between agencies in an agreed upon format.
Segment	The period between an employee's login and logout. There can be multiple segments within a tour.
Straggler Tag Box	A box to store returned devices for re-assignment.
Subordinate Agency	Some Agencies are responsible for multiple smaller agencies. These smaller agencies are referred to as being subordinate.
Tag (also called a device)	This term refers to the electronic transponder that a customer places in/on their vehicle. The tag is read/written by the lane equipment and contains information regarding the customer's account and vehicle.
Tour of Duty	An agency established shift or scheduled period of work.

Appendix A - Business Rules

VECTOR is a highly flexible system that allows agencies to tailor the software to meet their unique processing needs. During system implementation, agencies review VECTOR functionality and define how they will implement it. VECTOR implementation includes (among other things) the loading of tables that contain agency business rules that drive the automation of VECTOR functionality. These tables are not hard coded, so that as an agency's business changes, the tables can be modified to reflect the new business rules. The following document describes configurable VECTOR options and how existing agency customers have chosen to implement them. This list is not exhaustive and only covers the more significant business rule options.

A.1 Customer Account Management

A.1.1 Account Types

Customer accounts can be categorized and grouped for processing. The type of account will determine which set of business rules apply and what options are available. Table A-1 describes the agency specific business rules for each account type:

Table A-1 Agency Specific Business Rules

Account Types	Account Balance	E-Zpass NY All Agencies*			MDTA	DRBA	NJTA
		MTA	NYSTA	PANYNJ			
<input type="checkbox"/> Private	Pre-paid	X	X	X	X	X	X
<input type="checkbox"/> Commercial	Post-paid		X				X
<input type="checkbox"/> Business	Pre-paid	X	X	X	X	X	X
<input type="checkbox"/> Non revenue	No fee	X	X	X	X	X	X
<input type="checkbox"/> Companion							X
<input type="checkbox"/> Fleet							

*E-ZPass New York Agencies are MTA, NYSTA, and PANYNJ.

Agencies may establish restrictions on the types of plans that may be purchased for an account type. Table A-2 lists agency account type and plan restrictions.

Table A-2 Agency Account Type and Plan Restrictions

Account Types	Plan Restrictions	E-ZPass All Agencies	MDTA	DRBA	NJTA
<input type="checkbox"/> Private	Restrictions	Eligible for commuter/annual and other agency plans	Eligible for commuter and standard plan	Eligible for discount plans and standard plan	Eligible for commuter/annual and other agency plans
<input type="checkbox"/> Commercial		Not eligible for commuter/residence		N/A	Not eligible for commuter/residence
<input type="checkbox"/> Business		Not eligible for commuter/residence	Eligible for commuter, business (2axle) and post usage disc. (3+axle)	Not eligible for commuter	Not eligible for commuter/residence
<input type="checkbox"/> Non revenue		Plans restricted to Standard, Business, T2C, and PASI	Restricted to non-rev plans	DRBA facilities only	Restricted to non-rev plans
<input type="checkbox"/> Fleet	Under 7,000 lbs, Class 2 Veh only				

Account types may be restricted to certain vehicle classifications. The following tables list the agency specific business rules for account vehicle class restrictions.

Table A-3 Agency Specific Business Rules for Account Vehicle Class Restrictions

Account Types	Vehicle criteria	E-ZPass All Agencies	MDTA	DRBA	NJTA
<input type="checkbox"/> Private	2 axles	X	X	2-axle vehicle with single rear tires, except RV's with 2 axles and dual tires	X
	Under 7,000 lbs	X	No weight restriction	No weight restriction	X
	Vehicle class	All	All	All	
<input type="checkbox"/> Commercial		Unlimited	None	Not offered for DRBA	Unlimited
<input type="checkbox"/> Business	# axles (unlimited)	X	X	X	X
	over 7,000 lbs	X	X	X	
	Vehicle class	All	All	All	
<input type="checkbox"/> Non revenue					
<input type="checkbox"/> Fleet					

Agencies may restrict the number of tags per account type. The following table lists the agency specific tag limitations.

Table A-4 Agency Specific Tag Limitations

Account Types	Tag limits	E-ZPass All Agencies	MDTA	DRBA	NJTA
<input type="checkbox"/> Private	Max 4 tags	X		<i>Max 4 tags</i>	Max 4 tags
<input type="checkbox"/> Commercial	Unlimited	X	X	<i>Not offered</i>	Not offered
<input type="checkbox"/> Business	Unlimited	X	X	<i>Any account with more than 4 tags</i>	Any account with more than 4 tags
<input type="checkbox"/> Non revenue				<i>Unlimited</i>	Unlimited
<input type="checkbox"/> Fleet					

Agencies charge customers to lease or purchase tags. The following table lists tag costs by account type per agency.

Table A-5 Tag Costs by Account Type According to Agency

Account Types	Tag Costs	E-ZPass All Agencies	MDTA	DRBA	NJTA
<input type="checkbox"/> Private	Tag deposit	\$10.00/waived if pay by credit card	\$10.00/waived if pay by credit card	\$10.00/waived if pay by credit card ACH	\$10.00/waived if pay by credit card
<input type="checkbox"/> Commercial	Tag purchase	Exterior:\$28.30* Interior: \$22.50*	N/A	N/A	Exterior:\$29.40 Interior: \$23.00
<input type="checkbox"/> Business	Tag purchase	Exterior:\$28.30* Interior: \$22.50*	Exterior:\$28.80 * Interior:\$22.75 *	Exterior:\$28.55* Interior:\$22.50*	Exterior:\$29.40 Interior: \$23.00
<input type="checkbox"/> Non revenue	No charge	X	X	X	X
<input type="checkbox"/> Fleet					

* Tag purchase prices will be changing August 2002 to: Interior \$23.00/Exterior \$29.40

A.1.1.1 Account Establishment Methods

VECTOR provides multiple ways to establish an account on VECTOR. An account can be established by completing a paper application, a web-based application, or by applying over the phone. Table A-6 describes the methods used by each agency to establish an account on VECTOR.

Table A-6 Methods for Establishing Accounts

Method		E-ZPass All Agencies	MDTA	DRBA	NJTA
<input type="checkbox"/> Paper		X	X	X	X
<input type="checkbox"/> Web		X	E-mail application via web	X	X
<input type="checkbox"/> Telephone				X	X

For customer convenience, applications may be requested in multiple ways. VECTOR supports the following methods in Table A-7:

Table A-7 How to Request an Application

Method		E-ZPass All Agencies	MDTA	DRBA	NJTA
<input type="checkbox"/> Walk in		X	X	X	X
<input type="checkbox"/> Mail in		X	X	X	X
<input type="checkbox"/> Phone in		X	X	X	X
<input type="checkbox"/> Web		X	X	X	X
<input type="checkbox"/> VRS		X	X	X	X

A.1.1.1.1 Agency Assignment

As a new account is created on VECTOR, the automatic assignment of the agency that actually "owns" the account, referred to as the home agency, is determined by several factors.

Note: This applies only to CSCs that service multiple agencies.

Agency account ownership is first mapped, based on the geographical location of the customer. Each agency will have geographical areas that will be defined as 'belonging' to them (by state and/or zip code). Any customer that requests an account from an agency's area will be identified as belonging to that agency. The second factor that is taken into consideration is the plan(s) that the customer signs up for. If the customer resides in one agency's geographical area, but primarily uses another agency's plans, the latter agency is granted ownership of the account as shown in Table A-8.

Table A-8 Ownership of Accounts

Assignment	Criteria	E-ZPass NY			MDTA	DRBA	NJTA
		MTA	NYSTA	PANYNJ			
<input type="checkbox"/> Automatic Agency assignment implemented		X	X	X		X	X

A.1.1.1.2 E-ZPass Account Status and Account Balance

Table A-9 E-ZPass Account Status and Account Balance

Agency	Account Status	Account Balance
All E-ZPass agencies	Closed	N/A
	Closed Pending	Any. Acct. closed only after full payment is made.
	Good	>Replenishment Threshold
	Low Balance	>(-\$14.99) And <Replenishment Threshold
	Revoked Warning	After 30 days consecutive days of being below (\$14.99)
	Revoked Final	20 days after Revoked Warning Notice with no payment
	Suspended	N/A

A.1.1.1.3 Maryland Account Status and Account Balance

Table A-10 Maryland Account Status and Account Balance

Agency	Account Status	Account Balance
Maryland	Closed	N/A
	Closed Pending	Any
	Good	> Replenishment Threshold
	Low balance	>(\$0) and <Replenishment threshold
	Suspended	N/A

A.1.1.1.4 DRBA Account Status and Account Balance

Table A-11 DRBA Account Status and Account Balance

Agency	Account Status	Account Balance
DRBA	Closed	N/A
	Closed Pending	Any
	Good	>Replenishment Threshold
	Low Balance	>(-\$14.99) And <Replenishment Threshold
	Revoked Warning	<(-\$14.99)
	Revoked Final	3 weeks after Revoked Warning Notice with no payment
	Suspended	N/A

A.1.1.1.5 NJTA Account Status and Account Balance

Table A-12 NJTA Account Status and Account Balance

Agency	Account Status	Account Balance
NJTA	Closed	N/A
	Closed Pending	Any
	Good	>Replenishment Threshold
	Low Balance	>(-\$14.99) And <Replenishment Threshold
	Revoked Warning	<(-\$14.99)
	Revoked Final	20 days after Revoked Warning Notice with no payment
	Suspended	N/A

A.1.1.2 Customer Statements

Customer statements are generated periodically based on customer anniversary dates. Statements can be sent via multiple methods and media. Table A-12 lists the agency specific business rules for statement generation.

Table A-12 Statement Generation Method

Account type	Method	E-ZPass All Agencies	MDTA	DRBA	NJTA
<input type="checkbox"/> Private	E-mail	X		X	X
	Disk				
	Mail	X - \$6 fee annually	X	X	X- \$6 fee annually
	FED EX				
	DHL				
	UPS				
<input type="checkbox"/> Business	E-Mail	X		X	X
	Disk	X		X	X
	Mail	X	X	X	X

Table A-13 Statement Generation Frequency

Account type	Frequency Information	E-ZPass All Agencies	MDTA	DRBA	NJTA
<input type="checkbox"/> Private	None	X	X	X	X
	Monthly	X		Monthly for 1st six months	X
	Bi-monthly	X	X	bi-monthly after 1st six months "Monthly" for an annual cost of \$6.00	X
<input type="checkbox"/> Business	Frequency				
	None		X		X
	Monthly		X	X	X
	Bi-monthly				X
	Suppression for accounts with no activity	X	X	X	X
	Use of Mail house	ADM	ADM	ADM	Data Direct

A.1.1.3 Customer Complaints



Customer interaction can be tracked through VECTOR. Complaints are identified and tracked based upon the agency specific business rules as shown in Table A-14:

Table A-14 Tracking Customer Interaction

Information		E-ZPass All Agencies	MDTA	DRBA	NJTA
<input type="checkbox"/> Source	FAX	X	X	X	X
	Phone	X	X	X	X
	Mail	X	X	X	X
	In Person	X	X	X	X
<input type="checkbox"/> Category	Customer	X	X	X	X
	Other	X	X	X	X
	Toll Dispute	X	X	X	X
	Tag request	X	X	X	X
	Plans	X	X	X	X
	CC disputes	X	X	X	X
	Violations	X	X	X	X
	Sticker	X			
	Close account	X	X	X	X
	Fee dispute	X	X	X	X
<input type="checkbox"/> Status	Opened	X	X	X	X
	Forwarded	X	X	X	X
	Closed	X	X	X	X
	Pending	X	X	X	X
	Reviewed		X		

A.1.2 Agency Plans

Based upon special eligibility criteria, frequent user and other discounts are implemented in VECTOR via 'plans' that are added to a customer's account. There are several types of plans that are available to an Agency, that provide flexibility in their implementations. The main plan types are; Standard, Commuter, Annual, Residential, Business, Commercial, and Non-Revenue. Table A-15 lists the agency plans, with trip requirements and restrictions.

Table A-15 E-ZPass NY Plans

Account type	Plan	Description	Agency	Prepaid amount	Trip Requirements	Toll Discount	Restrictions
<input type="checkbox"/> Private	Standard	Basic	PANYNJ/ MTA/ NYSTA	Cash, check 1-2 tags \$25.00 3-4 tags \$50.00 credit card 1-4 tags \$25.00			None
<input type="checkbox"/> Business	Business	Business	PANYNJ/ MTA/ NYSTA	\$50/commercial axle and \$25/private vehicle			
<input type="checkbox"/> Private	Resident						
	SIR	Staten Island Resident	MTA	Requires Standard Plan	None	\$3.20 vs. \$7.00	Verrazano Narrows Bridge
	RR	Rockaway Resident	MTA	Requires Standard Plan	None		Cross Bay Bridge, Marine parkway. Type 2 vehicles only
	SIRSTICKER	Staten Island resident sticker	MTA				

Account type	Plan	Description	Agency	Prepaid amount	Trip Requirements	Toll Discount	Restrictions
	RRSTICKER c	Rockaway resident sticker	MTA			\$.67 vs. \$1.75 0.67 vs. \$1.75	
<input type="checkbox"/> Private	Commuter						
	PACP	Port Authority Carpool	PANYNJ	Requires Standard Plan		\$1.00 vs. \$6.00	3 or more people, type 2 vehicles only
	PASI	Port Authority Staten Island Bridges Plan	PANYNJ	\$50.00	20 trips in 35 days	\$2.50 vs. \$6.00	Goethals, Bayonne, and Outerbridge crossing
	GIR	Grand Island Resident	NYSTA	\$5		0.09 vs. 0.50	Proof of residency
	GIC	Grand Island Commuter Plan	NYSTA	\$5.00	10 trips in 30 days	0.13 vs. 0.50	
	TZC	Tappan Zee Bridge Commuter plan	NYSTA	\$20.00	17 trips in 30 days	\$1.00 vs. \$3.00	
	TZPL	Tappan Zee Bridge Car Pool	NYSTA	\$25.00	17 trips in 30 days	.50 vs. \$3.00	3 or more people, type 2 vehicles only
<input type="checkbox"/> Commercial	NYCOML	Post paid commercial	NYSTA	None			
<input type="checkbox"/> Private – annual	NY12	NYSTA annual Permit Plan	NYSTA	Annual prepaid \$80.00 (pro-rated by month)	Customer limited to 30 miles, else pays discounted rate for extra miles.		Tag Specific
<input type="checkbox"/> Commuter	NYSBA	New York Bridge Authority	NYSTA	\$25.00	17 trips in 30 days	0.50 vs. \$1.01	5 mid Hudson bridges. Tag specific
<input type="checkbox"/> Non-Revenue	MTAF	Non-Revenue – MTA Franchise Busses	MTA				

Account type	Plan	Description	Agency	Prepaid amount	Trip Requirements	Toll Discount	Restrictions
	TBNRRI	Non-Revenue Randels Island Only Plan	MTA	None			Tmborough Bridge only
	TBNRV	Non-Revenue	MTA	None			
	TBNREM	Non-Revenue – employee & retirees	MTA				
	TBNRFP	Non-Revenue – federal police	MTA	None			
	PANRPA	Non-Revenue – selected individuals, governors, PANYNJ directors	PANYNJ	None			
	PANREP	Non-Revenue – employee & retirees	PANYNJ	None			Tag Specific
	PANROF	Non-Revenue – official vehicles	PANYNJ	None			
	PANRPL	Non-Revenue	PANYNJ	None			
	NYNREM	Non-Revenue – employee & retirees	NYSTA	None			
	NYNRL	Non-Revenue	NYSTA	None			limited plazas on ticket portion of thruway. Tag specific
	NYNRTH	Non-Revenue – fleet vehicles	NYSTA	None			
	NYNRNB	Non-Revenue – for NY State Bridge Authority	NYSTA	None			Tag Specific



A.1.2.1 Maryland Plans

Table A-16 Maryland Plans

Account type	Plan	Description	Agency	Prepaid amount	Trip Requirements	Toll Discount	Restrictions
<input type="checkbox"/> Private	Standard	Casual Use		Cash/check \$25.00 1-2 tags \$50.00 3-4 tags Credit Card \$25.00 1-4 tags	Full fare no trip requirement	None	2 axle vehicles only
	MDTACMT	Commuter		\$20.00	50 trips to be used in a 60 day period	60% if all 50 trips are used	UUCT charge if all 50 trips are not used
	MDTAHWN	Nice Bridge Plan		\$15.00	25 trips to be used in a 60 day period	60% if all 25 trips are used	UUCT charge if all 25 trips are not used
	MDTAWPL	Lane Bridge Plan		\$25.00	25 trips to be used in a 60 day period	60% if all 25 trips are used	UUCT charge if all 25 trips are not used
<input type="checkbox"/> Business	MDAPOSTDISC	Post usage discount plan		# of commercial axles X \$25 toll deposit	No trip requirement	\$0-\$999 0% \$1000 - \$1999 = 5%, \$2000-\$2999 = 10%, \$3000 + = 15%	Maryland toll facilities only. 3+axle vehicle only
<input type="checkbox"/> Non-Revenue	NREMP	Non-revenue employee		None	None		
	NROFF	Non-revenue off		None	None		
	NRSTATE	Non-revenue state		None	None		
	NRPOL	Non-revenue Police		None	None		
	NROTH	Non-revenue other		None	None		

A.1.2.2 DRBA Plans

Table A-17 DRBA Plans

Account type	Plan	Description	Agency	Prepaid amount	Trip Requirements	Toll Discount	Restrictions
<input type="checkbox"/> Private	Standard	Basic		Cash, check, credit card: 1-2 tags \$25.00 or 4 tags \$50.00			Frequent Traveler Plans must have a Standard Plan
<input type="checkbox"/> Business	Commuter	Business		# of commercial axles @\$50.00 each, # of passenger vehicles @\$25.00 each.	As customer travels over one of four bridges at least 20 times a calendar month the commuters account will be credited with \$14	\$.30	Device specific, Class 2 vehicles only
<input type="checkbox"/> Non-revenue	DREM	DRBA employees			100 free trips per calendar year		On DRBA facilities only
							Funds must be placed on the account to cover trips on away facilities
	NRV	DRBA upper management			Unlimited trips		Funds must be placed on the account to cover trips on away facilities
	PATCO	PATCO employees			10 free trips per calendar year		On DRBA facilities only
							Funds must be placed on the account to cover trips on away facilities



A.1.2.3 NJTA Plans

Table A-18 NJTA Plans

Account type	Plan	Description	Agency	Prepaid amount	Trip Requirements	Restrictions
<input type="checkbox"/> Private	Standard	Basic		Cash, check, credit card: 1-2 tags \$25.00 or 4 tags \$50.00	None	Frequent Traveler Plans must have a Standard Plan
	SIR	MTA Staten Island Residency Plan		\$0	Customer must provide proof of residency	
	PASI	Port Authority Staten Island Bridge Plan		\$50 uuct's charged	20 trips in 35 days – starting with the initial use of the tag.	
	PACP	Port Authority Carpool Commuter Plan		\$0	None	
	TZC	Tappan Zee Commuter Plan		\$25 uuct's charged	17 trips in 30 days – new cycle will begin on the 31 st day.	
	TZPL	Tappan Zee Carpool ommuter Plan		\$25 uuct's charged	17 trips in 30 days – new cycle will begin on the 31 st day, 3 or more in vehicle use staffed lane.	
	ACE	ACE Frequent User Plan		\$0	30 or more trips during the previous 35-day period/	
	NY12	NYSTA Annual Permit- NY 12		No	None-Plan only covers the 1 st 30 miles of the ticketed portion of the roadway the customers travels.	
	NYSBA	NYSBA Bridges Discount Commuter Plan		\$25 uuct's charged	17 trips in 30 days per tag – new cycle will begin on the 31 st day.	
	DTHOV	Delaware Turnpike (1- 95) HOV Program		\$0	20 trips per month with 2 or more persons in the vehicle – must travel in staffed lanes between 12	

Account type	Plan	Description	Agency	Prepaid amount	Trip Requirements	Restrictions
					midnight Monday through 7:00 p.m. Friday.	
	SRHOV	Delaware (SR-1)HOV		\$0	20 trips per month with 2 or more persons in the vehicle – must travel in staffed lanes between 12 midnight Monday through 7:00 p.m. Friday.	
	SRFTP	Delaware SR-1 Frequent User Plan		\$0	20 trips within a 30-day rolling period.	
	DPCMT	DRPA Bridge Commuter Plan		\$0	Minimum of 18 trips in a calendar month to receive a rebate/discount of \$18 per tag.	
	DRVACM TP	DRBA Commuter Plan		\$18.75 uuct's charged	Minimum of 25 trips within 30-day period	
	DRBAFTP	DRBA Frequent User Plan		\$20 uuct's charged	Minimum of 20 trips with 90-day period	
	PATCO		DRPA			
<input type="checkbox"/> Business	Commuter	Business		# of commercial axles @\$50.00 each, # of passenger vehicles @\$25.00 each.	As customer travels over one of four bridges at least 20 times a calendar month the commuters account will be credited with \$14	Device specific, Class 2 vehicles only
<input type="checkbox"/> Non-revenue	DREM	DRBA employees			100 free trips per calendar year	On DRBA facilities only
						Funds must be placed on the account to cover trips on away facilities
	NRV	DRBA upper management			Unlimited trips	Funds must be placed on the account to cover trips on away facilities



Account type	Plan	Description	Agency	Prepaid amount	Trip Requirements	Restrictions
	PATCO	PATCO employees			10 free trips per calendar year	On DRBA facilities only
						Funds must be placed on the account to cover trips on away facilities



A.1.3 Plan Suspensions

At the customer's request, a discount/commuter plan can be suspended for a period of time, during which the commuter will not be using the E-ZPass facilities. The following tables describe the criteria for plan suspensions.

Table A-18 Plan Suspensions

Information	Min/Max Number of Suspensions	NYSTA/NYSBA	MDTA	DRBA	NJTA
<input type="checkbox"/> Voluntary	Limited to a maximum of four per year	X	N/A	X	X
	Require a minimum of one week in duration*	X	N/A	X	X

*The first trip will be out of suspension, providing that the plan has been in suspension for a least one-week, therefore, the specified end date does not bring the plan out of suspension.

** Cannot suspend ACE plan

A.1.4 Renewal notices for annual periodic plans

Renewal notices are sent to customers who participate in periodic plans (i.e., annual plan) at an agency specified time prior to the expiration date of the plan

Table A-19 Renewal Notices

Account Type	Notice Type	E-ZPass All Agencies	MDTA	DRBA	NJTA
<input type="checkbox"/> Process	Renewal notice	Sent 1 to 1 ½ months prior to expiration date of plan.	N/A	N/A	Sent 1 to 1 ½ months prior to expiration date of plan.
	Payment method	Cash			Cash
		Check			Check
		Credit Card			Credit Card

A.2 Financial Processing (FPMS)

A.2.1 Payment Processing

Customers are permitted to make payments via the following methods:

Table A-20 Payment Processing

Method		E-ZPass All Agencies	MDTA	DRBA	NJTA
<input type="checkbox"/> Phone in		X		X	X
<input type="checkbox"/> Walk in		X	X	X	X
<input type="checkbox"/> Web				X	X
<input type="checkbox"/> Mail in		X	X	X	X

A.2.2 Types of Payments

Customers may make the following types of payments:

Table A-21 Types of Payments

Payment type		E-ZPass All Agencies	MDTA	DRBA	NJTA
<input type="checkbox"/> Check		X	X	X	X
<input type="checkbox"/> Cash		X	X	X	X
<input type="checkbox"/> Credit Card		X	X	X	X
<input type="checkbox"/> Money Order		X	X	X	X
<input type="checkbox"/> Debit Card		X			X
<input type="checkbox"/> EFT					X

* Replenishment processing only

The following credit cards may be used:

Table A-22 Credit Card Payments

Payment type		E-ZPass All Agencies	MDTA	DRBA	NJTA
<input type="checkbox"/> Master card		X	X	X	X
<input type="checkbox"/> Visa		X	X	X	X
<input type="checkbox"/> American Express		X	X	X	X
<input type="checkbox"/> Discover		X	X	X	X

A.2.3 Credit Card Processing

Financial institutions are utilized by agencies to process credit card payments. The following table lists the relationships that each agency has to a financial institution.

Table A-23 Credit Card Processing

	Financial Institution	E-ZPass NY All Agencies			MDTA	DRBA	NJTA
		MTA	NYSTA	PANYNJ			
Credit Card Processing	First Data/Chase	X	X	X	X		X
ACH	Mellon Bank					X	N/A

A.2.4 Check Processing

In addition to On-Line check processing, VECTOR provides the capability to handle batch processing of checks. The following table lists the agency specific batch check processing tools.

Table A-24 Check Processing

Batch Check Processing	Device	E-Zpass NY All Agencies			MdTA	DRBA	NJTA
		MTA	NYSTA	PANYNJ			
Device	DP500	X	X	X	N/A	N/A	X

A.2.5 Credit Card Expiration Process

VECTOR captures the expiration date for credit cards that are used for payment. Since a valid expiration date is required to process a credit card, VECTOR notifies customers whose credit cards are about to expire. The following describes the agency specific processing rules for this process. If the credit card is declined, then the account is converted to cash.

Note: The customer will be charged a tag deposit when they convert to paying by cash.

Table A-25 Credit Card Expiration Process

Information	Expiration Notification Process	E-ZPass All Agencies	MDTA	DRBA	NJTA
<input type="checkbox"/> Process	Initial notice	X	X	X	X
	Follow up letter		X	X	
	Customer doesn't respond within 30 days Convert to cash customer	Replenishment declined due to expiration not being updated Account converted to cash	Replenishment declined due to expiration not being updated Account converted to cash	X	Replenishment declined due to expiration not being updated Account converted to cash

A.2.6 Account Replenishment

Customer accounts may be replenished when their balance reaches an agency specific threshold. The following lists the agency specific business rules related to replenishment processing. All accounts are periodically evaluated to ensure that the replenishment amounts are equal to one month of the customer's toll usage.

There are two types of evaluation: initial and recurring. All accounts are initially evaluated. The initial evaluation is set to occur sometime shortly after the customer establishes the account as defined by the Agency (i.e., 30 days after first toll use). The frequency of the recurring evaluation is determined by the Agency.

A.2.6.1 E-ZPass

Table A-26 E-ZPass Replenishment

Account type	Plan	Description	Agency	Payment Method	Threshold	Initial Amount	
<input type="checkbox"/> Private	Standard	Basic	PANYNJ	Cash, check	\$25.50	\$25.00	
				Credit card	\$10.00	\$25.00	
<input type="checkbox"/> Business	Business	Business Plan		Cash, Check	\$25.00	\$50.00	
				Credit card	\$12.50	\$50.00	
<input type="checkbox"/> Private	Resident						
	SIR	Staten Island Resident	MTA	N/A	0	0	
	RR	Rockaway Resident	MTA	N/A	0	0	
	SIRSTICKER	Staten Island resident sticker	MTA	N/A	0	0	
	RRSTICKER	Rockaway resident sticker	MTA	N/A	0	0	
	Commuter						
<input type="checkbox"/> Private	PACP	Port Authority Carpool	PANYNJ	Cash/check Credit card	Standard Plan is required	Standard Plan is required	
	PASI	Port Authority Staten Island Bridges Plan	PANYNJ	Cash/check Credit card	\$25.00 \$10.00	\$50.00 \$50.00	
	GIR	Grand Island Resident	NYSTA	Cash/check Credit card	\$2.50 \$2.00	\$5.00 \$5.00	
	GIC	Grand Island Commuter Plan	NYSTA	Cash/check Credit card	\$2.50 \$2.00	\$5.00 \$5.00	
	TZC	Tappan Zee Bridge Commuter plan			Cash/check	\$12.50	\$25.00
					Credit card	\$10.00	\$25.00

Account type	Plan	Description	Agency	Payment Method	Threshold	Initial Amount
	TZPL	Tappan Zee Bridge Car Pool	NYSTA	Cash/check Credit card	\$12.50 \$10.00	\$25.00 \$25.00
	NYSBA	New York Bridge Authority	NYSTA	Cash/check Credit card	\$12.50 \$10.00	\$25.00 \$25.00
<input type="checkbox"/> Private – annual	NY12	NYSTA annual Permit Plan	NYSTA	N/A	0	0
<input type="checkbox"/> Commercial	NYCOML	Post paid commercial	NYSTA	N/A	0	0
<input type="checkbox"/> Non-Revenue		Does not apply		N/A	N/A	N/A
<input type="checkbox"/> Analysis for new accounts	Frequency	35 days from the first use of tolls and every 90 days thereafter				

A.2.6.2 Maryland

Table A-27 Maryland Replenishment

Account type	Plan	Description	Agency	Payment Method	Threshold	Amount
<input type="checkbox"/> Private	Standard	Casual Use		Cash, check Credit card	\$10.00	\$25.00
	MDTACMT	Commuter		Cash, check Credit card	\$10.00	\$25.00
	MDTAHWN	Nice Bridge Plan		Cash, check Credit card		
	MDTAWPL	Lane Bridge Plan		Cash, check Credit card		
<input type="checkbox"/> Business	MDAPOSTDISC	Post usage discount plan		Cash, check Credit card	\$25.00	\$50.00

A.2.6.3 DRBA

Table A-28 DRBA Replenishment

Account type	Plan	Description	Agency	Payment Method	Threshold	Amount
<input type="checkbox"/> Private	DRBACMTP	Commuter plan		Cash, check	\$22.50	\$45.00
				Credit card	\$10.00	\$43.75
	DRBAFTP	Frequent Traveler Discount Plan		Cash, check	\$22.00	\$43.75
				Credit card	\$10.00	\$43.75
<input type="checkbox"/> Private	Standard			Cash, check 1-2 tags	\$12.50	\$25.00
<input type="checkbox"/> Private	Standard			Credit card 1-2 tags	\$10.00	\$25.00
<input type="checkbox"/> Private	Standard			Cash, check 3-4 tags	\$25.00	\$50.00
<input type="checkbox"/> Private	Standard			Credit card 3-4 tags	\$10.00	\$50.00
<input type="checkbox"/> Business	Business			Cash, check	50% of initial account opening payment	
<input type="checkbox"/> Business	Business			Credit card	25% of initial account opening payment	

A.2.6.4 NJTA

Table A-29 NJTA Replenishment

Account type	Plan	Description	Agency	Payment Method	Threshold	Amount
<input type="checkbox"/> Private	NJTACMTP		NJTA	Cash/check Credit card	CC is 25% of rebill or \$10; whichever is higher. All other payment types are 50%.	
	NJTAFTP		NJTA	Cash/check Credit card	CC is 25% of rebill or \$10; whichever is higher. All other payment types are 50%.	
<input type="checkbox"/> Private	Standard		NJTA	Cash/check Credit card	CC is 25% of rebill or \$10; whichever is higher. All other payment types are 50%.	\$25.00
<input type="checkbox"/> Private	Business		NJTA	Cash/check	CC is 25% of rebill or \$10; whichever is higher. All other payment types	\$5.00

Account type	Plan	Description	Agency	Payment Method	Threshold	Amount
					are 50%.	
<input type="checkbox"/> Private	Business		NJTA	Credit card	CC is 25% of rebill or \$10; whichever is higher. All other payment types are 50%.	\$5.00
<input type="checkbox"/> Private	TZC		NJTA	Cash/check Credit card	CC is 25% of rebill or \$10; whichever is higher. All other payment types are 50%.	\$25.00
<input type="checkbox"/> Private	TZPL		NJTA	Cash/check Credit card	CC is 25% of rebill or \$10; whichever is higher. All other payment types are 50%.	\$25.00
<input type="checkbox"/> Private	NY12		NJTA	Cash/check Credit card	CC is 25% of rebill or \$10; whichever is higher. All other payment types are 50%.	\$0
<input type="checkbox"/> Private	SIR		NJTA	Cash/check Credit card	CC is 25% of rebill or \$10; whichever is higher. All other payment types are 50%.	\$0
<input type="checkbox"/> Private	PASI		NJTA	Cash/check Credit card	CC is 25% of rebill or \$10; whichever is higher. All other payment types are 50%.	\$50.00
<input type="checkbox"/> Private	PANREP		NJTA	Cash/check Credit card	CC is 25% of rebill or \$10; whichever is higher. All other payment types are 50%.	\$0
<input type="checkbox"/> Private	PACP		NJTA	Cash/check Credit card	CC is 25% of rebill or \$10; whichever is higher. All other payment types are 50%.	\$25.00
<input type="checkbox"/> Private	NYSBA		NJTA	Cash/check Credit card	CC is 25% of rebill or \$10; whichever is higher. All other payment types are 50%.	\$25.00
<input type="checkbox"/> Private	ACE		NJTA	Cash/check Credit card	CC is 25% of rebill or \$10; whichever is higher. All other payment types are 50%.	\$25.00
<input type="checkbox"/> Private	SRFTP		NJTA	Cash/check Credit card	CC is 25% of rebill or \$10; whichever is higher. All other payment types are 50%.	\$25.00
<input type="checkbox"/> Private	DPCMT		NJTA	Cash/check Credit card	CC is 25% of rebill or \$10; whichever is higher. All other payment types are 50%.	\$25.00
<input type="checkbox"/> Private	NJTBD		NJTA	Cash/check	CC is 25% of rebill or \$10; whichever is higher. All other payment types are 50%.	\$25.00



Account type	Plan	Description	Agency	Payment Method	Threshold	Amount
<input type="checkbox"/> Private	NJTBD		NJTA	Credit card	CC is 25% of rebill or \$10; whichever is higher. All other payment types are 50%.	\$25.00
<input type="checkbox"/> Private	NJCOML		NJTA	Cash/check Credit card	CC is 25% of rebill or \$10; whichever is higher. All other payment types are 50%.	\$0
<input type="checkbox"/> Private	NJTRANRE V		NJTA	Cash, check 1-2 tags	CC is 25% of rebill or \$10; whichever is higher. All other payment types are 50%.	\$0
<input type="checkbox"/> Private	NJTRANRE V		NJTA	Credit card 1-2 tags	CC is 25% of rebill or \$10; whichever is higher. All other payment types are 50%.	\$0
<input type="checkbox"/> Private	NJTRANRE V		NJTA	Cash, check Credit card 3-4 tags	CC is 25% of rebill or \$10; whichever is higher. All other payment types are 50%.	\$0
<input type="checkbox"/> Private	NJHANREV		NJTA	Cash, check 1-2 tags	CC is 25% of rebill or \$10; whichever is higher. All other payment types are 50%.	\$0
<input type="checkbox"/> Private	NJHANREV		NJTA	Credit card 1-2 tags	CC is 25% of rebill or \$10; whichever is higher. All other payment types are 50%.	\$0
<input type="checkbox"/> Private	NJHANREV		NJTA	Cash, check Credit card 3-4 tags	CC is 25% of rebill or \$10; whichever is higher. All other payment types are 50%.	\$0
<input type="checkbox"/> Private	SJTRANRE V		NJTA	Cash, check 1-2 tags	CC is 25% of rebill or \$10; whichever is higher. All other payment types are 50%.	\$0
<input type="checkbox"/> Private	SJTRANRE V		NJTA	Credit card 1-2 tags	CC is 25% of rebill or \$10; whichever is higher. All other payment types are 50%.	\$0
<input type="checkbox"/> Private	SJTRANRE V		NJTA	Cash, check Credit card 3-4 tags	CC is 25% of rebill or \$10; whichever is higher. All other payment types are 50%.	\$0
<input type="checkbox"/> Private	NJHBDP		NJTA	Cash/check Credit card	CC is 25% of rebill or \$10; whichever is higher. All other payment types are 50%.	\$25.00
<input type="checkbox"/> Private	NJHSBDP		NJTA	Cash/check	CC is 25% of rebill or \$10; whichever is higher. All other payment types are 50%.	\$25.00
<input type="checkbox"/> Private	NJHSBDP		NJTA	Credit card	CC is 25% of rebill or	\$25.00



Account type	Plan	Description	Agency	Payment Method	Threshold	Amount
					\$10; whichever is higher. All other payment types are 50%.	
<input type="checkbox"/> Private	DRBACMT P		NJTA	Cash/check Credit card	CC is 25% of rebill or \$10; whichever is higher. All other payment types are 50%.	\$18.75
<input type="checkbox"/> Private	DRBAFTP		NJTA	Cash/check Credit card	CC is 25% of rebill or \$10; whichever is higher. All other payment types are 50%.	\$25.00
<input type="checkbox"/> Commercial	Standard		NJTA	Cash/check Credit card	CC is 25% of rebill or \$10; whichever is higher. All other payment types are 50%.	\$25.00
<input type="checkbox"/> Commercial	Business		NJTA	Cash/check	CC is 25% of rebill or \$10; whichever is higher. All other payment types are 50%.	\$5.00
<input type="checkbox"/> Commercial	Business		NJTA	Credit card	CC is 25% of rebill or \$10; whichever is higher. All other payment types are 50%.	\$5.00
<input type="checkbox"/> Commercial	TZC		NJTA	Cash/check Credit card	CC is 25% of rebill or \$10; whichever is higher. All other payment types are 50%.	\$25.00
<input type="checkbox"/> Commercial	TZPL		NJTA	Cash/check Credit card	CC is 25% of rebill or \$10; whichever is higher. All other payment types are 50%.	\$25.00
<input type="checkbox"/> Commercial	NY12		NJTA	Cash/check Credit card	CC is 25% of rebill or \$10; whichever is higher. All other payment types are 50%.	\$0
<input type="checkbox"/> Commercial	SIR		NJTA	Cash/check Credit card	CC is 25% of rebill or \$10; whichever is higher. All other payment types are 50%.	\$0
<input type="checkbox"/> Commercial	PASI		NJTA	Cash/check Credit card	CC is 25% of rebill or \$10; whichever is higher. All other payment types are 50%.	\$50.00
<input type="checkbox"/> Commercial	PANREP		NJTA	Cash/check Credit card	CC is 25% of rebill or \$10; whichever is higher. All other payment types are 50%.	\$0
<input type="checkbox"/> Commercial	PACP		NJTA	Cash/check Credit card	CC is 25% of rebill or \$10; whichever is higher. All other payment types are 50%.	\$25.00
<input type="checkbox"/> Commercial	NYSBA		NJTA	Cash/check	CC is 25% of rebill or	\$25.00



Account type	Plan	Description	Agency	Payment Method	Threshold	Amount
				Credit card	\$10; whichever is higher. All other payment types are 50%.	
<input type="checkbox"/> Commercial	ACE		NJTA	Cash/check Credit card	CC is 25% of rebill or \$10; whichever is higher. All other payment types are 50%.	\$25.00
<input type="checkbox"/> Commercial	SRFTP		NJTA	Cash/check Credit card	CC is 25% of rebill or \$10; whichever is higher. All other payment types are 50%.	\$25.00
<input type="checkbox"/> Commercial	DPCMT		NJTA	Cash/check Credit card	CC is 25% of rebill or \$10; whichever is higher. All other payment types are 50%.	\$25.00
<input type="checkbox"/> Commercial	NJTBD		NJTA	Cash/check	CC is 25% of rebill or \$10; whichever is higher. All other payment types are 50%.	\$25.00
<input type="checkbox"/> Commercial	NJTBD		NJTA	Credit card	CC is 25% of rebill or \$10; whichever is higher. All other payment types are 50%.	\$25.00
<input type="checkbox"/> Commercial	NJCOML		NJTA	Cash/check Credit card	CC is 25% of rebill or \$10; whichever is higher. All other payment types are 50%.	\$0
<input type="checkbox"/> Commercial	NJTRANRE V		NJTA	Cash, check 1-2 tags	CC is 25% of rebill or \$10; whichever is higher. All other payment types are 50%.	\$0
<input type="checkbox"/> Commercial	NJTRANRE V		NJTA	Credit card 1-2 tags	CC is 25% of rebill or \$10; whichever is higher. All other payment types are 50%.	\$0
<input type="checkbox"/> Commercial	NJTRANRE V		NJTA	Cash, check Credit card 3-4 tags	CC is 25% of rebill or \$10; whichever is higher. All other payment types are 50%.	\$0
<input type="checkbox"/> Commercial	NJHANREV		NJTA	Cash, check 1-2 tags	CC is 25% of rebill or \$10; whichever is higher. All other payment types are 50%.	\$0
<input type="checkbox"/> Commercial	NJHANREV		NJTA	Credit card 1-2 tags	CC is 25% of rebill or \$10; whichever is higher. All other payment types are 50%.	\$0
<input type="checkbox"/> Commercial	NJHANREV		NJTA	Cash, check Credit card 3-4 tags	CC is 25% of rebill or \$10; whichever is higher. All other payment types are 50%.	\$0
<input type="checkbox"/> Commercial	SJTRANRE V		NJTA	Cash, check 1-2 tags	CC is 25% of rebill or \$10; whichever is higher.	\$0



Account type	Plan	Description	Agency	Payment Method	Threshold	Amount
					All other payment types are 50%.	
<input type="checkbox"/> Commercial	SJTRANRE V		NJTA	Credit card 1-2 tags	CC is 25% of rebill or \$10; whichever is higher. All other payment types are 50%.	\$0
<input type="checkbox"/> Commercial	SJTRANRE V		NJTA	Cash, check Credit card 3-4 tags	CC is 25% of rebill or \$10; whichever is higher. All other payment types are 50%.	\$0
<input type="checkbox"/> Commercial	NJHBDP		NJTA	Cash/check Credit card	CC is 25% of rebill or \$10; whichever is higher. All other payment types are 50%.	\$25.00
<input type="checkbox"/> Commercial	NJHSBDP		NJTA	Cash/check	CC is 25% of rebill or \$10; whichever is higher. All other payment types are 50%.	\$25.00
<input type="checkbox"/> Commercial	NJHSBDP		NJTA	Credit card	CC is 25% of rebill or \$10; whichever is higher. All other payment types are 50%.	\$25.00
<input type="checkbox"/> Commercial	DRBACMT P		NJTA	Cash/check Credit card	CC is 25% of rebill or \$10; whichever is higher. All other payment types are 50%.	\$18.75
<input type="checkbox"/> Commercial	DRBAFTP		NJTA	Cash/check Credit card	CC is 25% of rebill or \$10; whichever is higher. All other payment types are 50%.	\$25.00
<hr/>						
<input type="checkbox"/> Business	Standard		NJTA	Cash/check Credit card	CC is 25% of rebill or \$10; whichever is higher. All other payment types are 50%.	\$25.00
<input type="checkbox"/> Business	Business		NJTA	Cash/check	CC is 25% of rebill or \$10; whichever is higher. All other payment types are 50%.	\$5.00
<input type="checkbox"/> Business	Business		NJTA	Credit card	CC is 25% of rebill or \$10; whichever is higher. All other payment types are 50%.	\$5.00
<input type="checkbox"/> Business	TZC		NJTA	Cash/check Credit card	CC is 25% of rebill or \$10; whichever is higher. All other payment types are 50%.	\$25.00
<input type="checkbox"/> Business	TZPL		NJTA	Cash/check Credit card	CC is 25% of rebill or \$10; whichever is higher. All other payment types are 50%.	\$25.00
<input type="checkbox"/> Business	NY12		NJTA	Cash/check	CC is 25% of rebill or \$10; whichever is higher.	\$0



Account type	Plan	Description	Agency	Payment Method	Threshold	Amount
				Credit card	All other payment types are 50%.	
<input type="checkbox"/> Business	SIR		NJTA	Cash/check Credit card	CC is 25% of rebill or \$10; whichever is higher. All other payment types are 50%.	\$0
<input type="checkbox"/> Business	PASI		NJTA	Cash/check Credit card	CC is 25% of rebill or \$10; whichever is higher. All other payment types are 50%.	\$50.00
<input type="checkbox"/> Business	PANREP		NJTA	Cash/check Credit card	CC is 25% of rebill or \$10; whichever is higher. All other payment types are 50%.	\$0
<input type="checkbox"/> Business	PACP		NJTA	Cash/check Credit card	CC is 25% of rebill or \$10; whichever is higher. All other payment types are 50%.	\$25.00
<input type="checkbox"/> Business	NYSBA		NJTA	Cash/check Credit card	CC is 25% of rebill or \$10; whichever is higher. All other payment types are 50%.	\$25.00
<input type="checkbox"/> Business	ACE		NJTA	Cash/check Credit card	CC is 25% of rebill or \$10; whichever is higher. All other payment types are 50%.	\$25.00
<input type="checkbox"/> Business	SRFTP		NJTA	Cash/check Credit card	CC is 25% of rebill or \$10; whichever is higher. All other payment types are 50%.	\$25.00
<input type="checkbox"/> Business	DPCMT		NJTA	Cash/check Credit card	CC is 25% of rebill or \$10; whichever is higher. All other payment types are 50%.	\$25.00
<input type="checkbox"/> Business	NJTBD		NJTA	Cash/check	CC is 25% of rebill or \$10; whichever is higher. All other payment types are 50%.	\$25.00
<input type="checkbox"/> Business	NJTBD		NJTA	Credit card	CC is 25% of rebill or \$10; whichever is higher. All other payment types are 50%.	\$25.00
<input type="checkbox"/> Business	NJCOML		NJTA	Cash/check Credit card	CC is 25% of rebill or \$10; whichever is higher. All other payment types are 50%.	\$0
<input type="checkbox"/> Business	NJTRAN REV		NJTA	Cash, check 1-2 tags	CC is 25% of rebill or \$10; whichever is higher. All other payment types are 50%.	\$0
<input type="checkbox"/> Business	NJTRAN REV		NJTA	Credit card 1-2 tags	CC is 25% of rebill or \$10; whichever is higher. All other payment types are 50%.	\$0



Account type	Plan	Description	Agency	Payment Method	Threshold	Amount
					are 50%.	
<input type="checkbox"/> Business	NJTRAN REV		NJTA	Cash, check Credit card 3-4 tags	CC is 25% of rebill or \$10; whichever is higher. All other payment types are 50%.	\$0
<input type="checkbox"/> Business	NJHANR EV		NJTA	Cash, check 1-2 tags	CC is 25% of rebill or \$10; whichever is higher. All other payment types are 50%.	\$0
<input type="checkbox"/> Business	NJHANR EV		NJTA	Credit card 1-2 tags	CC is 25% of rebill or \$10; whichever is higher. All other payment types are 50%.	\$0
<input type="checkbox"/> Business	NJHANR EV		NJTA	Cash, check Credit card 3-4 tags	CC is 25% of rebill or \$10; whichever is higher. All other payment types are 50%.	\$0
<input type="checkbox"/> Business	SJTRANR EV		NJTA	Cash, check 1-2 tags	CC is 25% of rebill or \$10; whichever is higher. All other payment types are 50%.	\$0
<input type="checkbox"/> Business	SJTRANR EV		NJTA	Credit card 1-2 tags	CC is 25% of rebill or \$10; whichever is higher. All other payment types are 50%.	\$0
<input type="checkbox"/> Business	SJTRANR EV		NJTA	Cash, check Credit card 3-4 tags	CC is 25% of rebill or \$10; whichever is higher. All other payment types are 50%.	\$0
<input type="checkbox"/> Business	NJHBDP		NJTA	Cash/check Credit card	CC is 25% of rebill or \$10; whichever is higher. All other payment types are 50%.	\$25.00
<input type="checkbox"/> Business	NJHSBDP		NJTA	Cash/check	CC is 25% of rebill or \$10; whichever is higher. All other payment types are 50%.	\$25.00
<input type="checkbox"/> Business	NJHSBDP		NJTA	Credit card	CC is 25% of rebill or \$10; whichever is higher. All other payment types are 50%.	\$25.00
<input type="checkbox"/> Business	DRBACM TP		NJTA	Cash/check Credit card	CC is 25% of rebill or \$10; whichever is higher. All other payment types are 50%.	\$18.75
<input type="checkbox"/> Business	DRBAFT P		NJTA	Cash/check Credit card	CC is 25% of rebill or \$10; whichever is higher. All other payment types are 50%.	\$25.00
<input type="checkbox"/> Business	Standard		NJTA	Cash/check Credit card	CC is 25% of rebill or \$10; whichever is higher. All other payment types	\$25.00

Account type	Plan	Description	Agency	Payment Method	Threshold	Amount
					are 50%.	
<input type="checkbox"/> Business	Business		NJTA	Cash/check	CC is 25% of rebill or \$10; whichever is higher. All other payment types are 50%.	\$5.00
<input type="checkbox"/> Business	Business		NJTA	Credit card	CC is 25% of rebill or \$10; whichever is higher. All other payment types are 50%.	\$5.00
<input type="checkbox"/> Business	TZC		NJTA	Cash/check Credit card	CC is 25% of rebill or \$10; whichever is higher. All other payment types are 50%.	\$25.00
<input type="checkbox"/> Business	TZPL		NJTA	Cash/check Credit card	CC is 25% of rebill or \$10; whichever is higher. All other payment types are 50%.	\$25.00
<input type="checkbox"/> Business	NY12		NJTA	Cash/check Credit card	CC is 25% of rebill or \$10; whichever is higher. All other payment types are 50%.	\$0
<input type="checkbox"/> Business	SIR		NJTA	Cash/check Credit card	CC is 25% of rebill or \$10; whichever is higher. All other payment types are 50%.	\$0
<input type="checkbox"/> Business	PASI		NJTA	Cash/check Credit card	CC is 25% of rebill or \$10; whichever is higher. All other payment types are 50%.	\$50.00
<input type="checkbox"/> Business	PANREP		NJTA	Cash/check Credit card	CC is 25% of rebill or \$10; whichever is higher. All other payment types are 50%.	\$0
<input type="checkbox"/> Business	PACP		NJTA	Cash/check Credit card	CC is 25% of rebill or \$10; whichever is higher. All other payment types are 50%.	\$25.00
<input type="checkbox"/> Business	NYSBA		NJTA	Cash/check Credit card	CC is 25% of rebill or \$10; whichever is higher. All other payment types are 50%.	\$25.00
<input type="checkbox"/> Business	ACE		NJTA	Cash/check Credit card	CC is 25% of rebill or \$10; whichever is higher. All other payment types are 50%.	\$25.00
<input type="checkbox"/> Business	SRFTP		NJTA	Cash/check Credit card	CC is 25% of rebill or \$10; whichever is higher. All other payment types are 50%.	\$25.00
<input type="checkbox"/> Business	DPCMT		NJTA	Cash/check Credit card	CC is 25% of rebill or \$10; whichever is higher. All other payment types are 50%.	\$25.00



Account type	Plan	Description	Agency	Payment Method	Threshold	Amount
<input type="checkbox"/> Business	NJTBD		NJTA	Cash/check	CC is 25% of rebill or \$10; whichever is higher. All other payment types are 50%.	\$25.00
<input type="checkbox"/> Business	NJTBD		NJTA	Credit card	CC is 25% of rebill or \$10; whichever is higher. All other payment types are 50%.	\$25.00
<input type="checkbox"/> Business	NJCOML		NJTA	Cash/check Credit card	CC is 25% of rebill or \$10; whichever is higher. All other payment types are 50%.	\$0
<input type="checkbox"/> Business	NJTRAN REV		NJTA	Cash, check 1-2 tags	CC is 25% of rebill or \$10; whichever is higher. All other payment types are 50%.	\$0
<input type="checkbox"/> Business	NJTRAN REV		NJTA	Credit card 1-2 tags	CC is 25% of rebill or \$10; whichever is higher. All other payment types are 50%.	\$0
<input type="checkbox"/> Business	NJTRAN REV		NJTA	Cash, check Credit card 3-4 tags	CC is 25% of rebill or \$10; whichever is higher. All other payment types are 50%.	\$0
<input type="checkbox"/> Business	NJHANR EV		NJTA	Cash, check 1-2 tags	CC is 25% of rebill or \$10; whichever is higher. All other payment types are 50%.	\$0
<input type="checkbox"/> Business	NJHANR EV		NJTA	Credit card 1-2 tags	CC is 25% of rebill or \$10; whichever is higher. All other payment types are 50%.	\$0
<input type="checkbox"/> Business	NJHANR EV		NJTA	Cash, check Credit card 3-4 tags	CC is 25% of rebill or \$10; whichever is higher. All other payment types are 50%.	\$0
<input type="checkbox"/> Business	SJTRANR EV		NJTA	Cash, check 1-2 tags	CC is 25% of rebill or \$10; whichever is higher. All other payment types are 50%.	\$0
<input type="checkbox"/> Business	SJTRANR EV		NJTA	Credit card 1-2 tags	CC is 25% of rebill or \$10; whichever is higher. All other payment types are 50%.	\$0
<input type="checkbox"/> Business	SJTRANR EV		NJTA	Cash, check Credit card 3-4 tags	CC is 25% of rebill or \$10; whichever is higher. All other payment types are 50%.	\$0
<input type="checkbox"/> Business	NJHBDP		NJTA	Cash/check Credit card	CC is 25% of rebill or \$10; whichever is higher. All other payment types are 50%.	\$25.00
<input type="checkbox"/> Business	NJHSBDP		NJTA	Cash/check	CC is 25% of rebill or	\$25.00



Account type	Plan	Description	Agency	Payment Method	Threshold	Amount
					\$10; whichever is higher. All other payment types are 50%.	
<input type="checkbox"/> Business	NJHSBDP		NJTA	Credit card	CC is 25% of rebill or \$10; whichever is higher. All other payment types are 50%.	\$25.00
<input type="checkbox"/> Business	DRBACM TP		NJTA	Cash/check Credit card	CC is 25% of rebill or \$10; whichever is higher. All other payment types are 50%.	\$18.75
<input type="checkbox"/> Business	DRBAFT P		NJTA	Cash/check Credit card	CC is 25% of rebill or \$10; whichever is higher. All other payment types are 50%.	\$25.00
					CC is 25% of rebill or \$10; whichever is higher. All other payment types are 50%.	
<input type="checkbox"/> Non-Revenue	Standard		NJTA	Cash/check Credit card	CC is 25% of rebill or \$10; whichever is higher. All other payment types are 50%.	\$25.00
<input type="checkbox"/> Non-Revenue	Business		NJTA	Cash/check	CC is 25% of rebill or \$10; whichever is higher. All other payment types are 50%.	\$5.00
<input type="checkbox"/> Non-Revenue	Business		NJTA	Credit card	CC is 25% of rebill or \$10; whichever is higher. All other payment types are 50%.	\$5.00
<input type="checkbox"/> Non-Revenue	TZC		NJTA	Cash/check Credit card	CC is 25% of rebill or \$10; whichever is higher. All other payment types are 50%.	\$25.00
<input type="checkbox"/> Non-Revenue	TZPL		NJTA	Cash/check Credit card	CC is 25% of rebill or \$10; whichever is higher. All other payment types are 50%.	\$25.00
<input type="checkbox"/> Non-Revenue	NY12		NJTA	Cash/check Credit card	CC is 25% of rebill or \$10; whichever is higher. All other payment types are 50%.	\$0
<input type="checkbox"/> Non-Revenue	SIR		NJTA	Cash/check Credit card	CC is 25% of rebill or \$10; whichever is higher. All other payment types are 50%.	\$0
<input type="checkbox"/> Non-Revenue	PASI		NJTA	Cash/check Credit card	CC is 25% of rebill or \$10; whichever is higher. All other payment types are 50%.	\$50.00
<input type="checkbox"/> Non-Revenue	PANREP		NJTA	Cash/check Credit card	CC is 25% of rebill or \$10; whichever is higher.	\$0



Account type	Plan	Description	Agency	Payment Method	Threshold	Amount
					All other payment types are 50%.	
<input type="checkbox"/> Non-Revenue	PACP		NJTA	Cash/check Credit card	CC is 25% of rebill or \$10; whichever is higher. All other payment types are 50%.	\$25.00
<input type="checkbox"/> Non-Revenue	NYSBA		NJTA	Cash/check Credit card	CC is 25% of rebill or \$10; whichever is higher. All other payment types are 50%.	\$25.00
<input type="checkbox"/> Non-Revenue	ACE		NJTA	Cash/check Credit card	CC is 25% of rebill or \$10; whichever is higher. All other payment types are 50%.	\$25.00
<input type="checkbox"/> Non-Revenue	SRFTP		NJTA	Cash/check Credit card	CC is 25% of rebill or \$10; whichever is higher. All other payment types are 50%.	\$25.00
<input type="checkbox"/> Non-Revenue	DPCMT		NJTA	Cash/check Credit card	CC is 25% of rebill or \$10; whichever is higher. All other payment types are 50%.	\$25.00
<input type="checkbox"/> Non-Revenue	NJTBD		NJTA	Cash/check	CC is 25% of rebill or \$10; whichever is higher. All other payment types are 50%.	\$25.00
<input type="checkbox"/> Non-Revenue	NJTBD		NJTA	Credit card	CC is 25% of rebill or \$10; whichever is higher. All other payment types are 50%.	\$25.00
<input type="checkbox"/> Non-Revenue	NJCOML		NJTA	Cash/check Credit card	CC is 25% of rebill or \$10; whichever is higher. All other payment types are 50%.	\$0
<input type="checkbox"/> Non-Revenue	NJTRAN REV		NJTA	Cash, check 1-2 tags	CC is 25% of rebill or \$10; whichever is higher. All other payment types are 50%.	\$0
<input type="checkbox"/> Non-Revenue	NJTRAN REV		NJTA	Credit card 1-2 tags	CC is 25% of rebill or \$10; whichever is higher. All other payment types are 50%.	\$0
<input type="checkbox"/> Non-Revenue	NJTRAN REV		NJTA	Cash, check Credit card 3-4 tags	CC is 25% of rebill or \$10; whichever is higher. All other payment types are 50%.	\$0
<input type="checkbox"/> Non-Revenue	NJHANR EV		NJTA	Cash, check 1-2 tags	CC is 25% of rebill or \$10; whichever is higher. All other payment types are 50%.	\$0
<input type="checkbox"/> Non-Revenue	NJHANR EV		NJTA	Credit card 1-2 tags	CC is 25% of rebill or \$10; whichever is higher. All other payment types are 50%.	\$0



Account type	Plan	Description	Agency	Payment Method	Threshold	Amount
					are 50%.	
<input type="checkbox"/> Non-Revenue	NJHANR EV		NJTA	Cash, check Credit card 3-4 tags	CC is 25% of rebill or \$10; whichever is higher. All other payment types are 50%.	\$0
<input type="checkbox"/> Non-Revenue	SJTRANR EV		NJTA	Cash, check 1-2 tags	CC is 25% of rebill or \$10; whichever is higher. All other payment types are 50%.	\$0
<input type="checkbox"/> Non-Revenue	SJTRANR EV		NJTA	Credit card 1-2 tags	CC is 25% of rebill or \$10; whichever is higher. All other payment types are 50%.	\$0
<input type="checkbox"/> Non-Revenue	SJTRANR EV		NJTA	Cash, check Credit card 3-4 tags	CC is 25% of rebill or \$10; whichever is higher. All other payment types are 50%.	\$0
<input type="checkbox"/> Non-Revenue	NJHBDP		NJTA	Cash/check Credit card	CC is 25% of rebill or \$10; whichever is higher. All other payment types are 50%.	\$25.00
<input type="checkbox"/> Non-Revenue	NJHSBDP		NJTA	Cash/check	CC is 25% of rebill or \$10; whichever is higher. All other payment types are 50%.	\$25.00
<input type="checkbox"/> Non-Revenue	NJHSBDP		NJTA	Credit card	CC is 25% of rebill or \$10; whichever is higher. All other payment types are 50%.	\$25.00
<input type="checkbox"/> Non-Revenue	DRBACM TP		NJTA	Cash/check Credit card	CC is 25% of rebill or \$10; whichever is higher. All other payment types are 50%.	\$18.75
<input type="checkbox"/> Non-Revenue	DRBAFT P		NJTA	Cash/check Credit card	CC is 25% of rebill or \$10; whichever is higher. All other payment types are 50%.	\$25.00



A.2.6.5 Credit Card Rebill Process

The credit card rebill process is the method by which an agency's customer, paying by credit card, is automatically rebilled when their account reaches a predetermined threshold amount. VECTOR examines customer accounts and identifies those with balances that have fallen below their preset threshold amount. Credit card and replenishment information for these accounts are gathered and sent to a financial institution for payment processing.

If the request for payment is denied, VECTOR will attempt to process the request again on the next rebill cycle. If the customer's rebill request is denied on an agency specific number of attempts, VECTOR will convert the customer to a cash account and send notification to the customer. The following table describes the agency specific business rules for the number of rebills attempts.

Table A-29 Credit Card Rebill Process

	E-Zpass NY			MDTA	DRBA	NJTA
	MTA	NYSTA	PANYNJ			
Is automatic replenishment processing implemented?	X	X	X	X	X	X
# of rebill attempts	2	2	2	2	3	

A.2.7 Calculation of initial payment

When a customer's account is created, an initial payment is calculated. This payment is based upon the plan and account type. The algorithm for calculating the amount by agency is listed below:

Table A-30 Calculation of Initial Payment

Information	Account type	E-ZPass All Agencies	MDTA	DRBA	NJTA
<input type="checkbox"/> Initial Payment	Private	(# of private vehicles * tag deposit) plus Toll deposit	Tag deposit, if any, plus toll deposit	Add the # of tags (1-2 \$25.00, 3-4 \$50.00) by the number of plans (commuter - \$20.00, Frequent Traveler \$18.75) and tag deposit if required.	(# of private vehicles * tag deposit) plus Toll deposit
	Business	(# of private vehicles * toll deposit) plus (# of commercial axles toll deposit)	# of tags (tag sale) toll deposit (commuter plans), Business plan (2 axle vehicles only) \$25 X # of 2 axle devices, Post Usage # of commercial axles X toll deposit	# of commercial axles @ \$50.00 each and the # of private vehicles @ \$25.00 each plus the cost of the tags	

Agencies establish administrative fees for handling replacement of tags, returned check fees and tag misuse. The following table lists the agency specific administrative fees. Fees for violations will be discussed in the violation processing section.

Table A-31 Agency Administrative Fees

Information	E-ZPass All Agencies	MDTA	DRBA	NJTA
<input type="checkbox"/> Replacement of interior tag	\$22.50*	\$22.75	\$22.50	\$23.00
<input type="checkbox"/> Replacement of exterior tag	\$28.30**	\$28.80	\$28.55	\$29.40
<input type="checkbox"/> Returned check fee	\$15.00	\$25.00	\$25.00	\$25.00

* Price will change to \$23.00 in August 2002

** Price will change to \$29.40 in August 2002

A.3 Violation Processing (VEMS)

This section defines the agency business rules and requirements as they pertain to the implementation of VEMS.

A.3.1 Violation Implementation

In VECTOR there are three ways a vehicle can be classified as a violator. They are class mismatch, speed and toll evasion. The implementation of VECTOR functionality to perform violation processing is based upon agency business rules. The following table identifies the functionality that each agency has configured in VECTOR to support violation processing.

Table A-32 Violation Process Support

Function	E-ZPass NY			MdTA	DRBA	NJTA
	MTA	NYSTA	PANYNJ			
<input type="checkbox"/> Toll Evasion		X	X	X	X	X
<input type="checkbox"/> Class Mismatch	X				X	
<input type="checkbox"/> Speed Enforcement		X	X		X	

A.3.2 Image Review

Violation images are captured in the lane and matched with a violation transaction identifying the date, time, lane and plaza. The images will be sent to VEMS for processing. Violation image review is performed by CSRs who visually examine the vehicle images captured at the lanes.

Table A-33 Violation Image Review

Function	E-Zpass NY			MdTA	DRBA	NJTA
	MTA	NYSTA	PANYNJ			
<input type="checkbox"/> Image review performed by the CSC	X	X	X	X	X	
<input type="checkbox"/> External organization to perform image review?						X

A.3.3 Conditions for image capture

The collection of images at the lane is based upon agency specific business rules. The following tables list the agency specific conditions for image capture and the resulting violation type.

A.3.3.1 PANYNJ Toll Evasion Tag/Account Status

Table A-34 PANYNJ Toll Evasion Tag/Account Status

Account Status	Device Status	Speed Suspension?	Account Balance	Image Capture	Image Review	Notice Type	Violation Type
Closed	-		N/A	X	X	Non-Customer	Tag Violation
Closed Pending	-		Any	X	X	Non-Customer	Tag Violation
Good	Active		>Replenishment Threshold			N/A	N/A
Low Balance	Active		>(-\$14.99) and <Replenishment Threshold			N/A	N/A
Low Balance	Active		<(-\$14.99)	X		Customer	Negative Balance Violation
Revoked Warning	Active		<(-\$14.99)	X		Customer	Customer Violation
Revoked Final	Active		<(-\$14.99)	X	X	Non-Customer	Tag Violation
N/A	Retained	N/A	N/A	X	X	Non-Customer	Tag Violation
N/A	Defective	N/A	N/A	X	X	Non-Customer	Tag Violation
N/A	Inventory	N/A	N/A	X	X	Non-Customer	Tag Violation
Any	Lost	N/A	Any	X	X	Non-Customer	Tag Violation
N/A	Returned	N/A	N/A	X	X	Non-Customer	Tag Violation
Any	Stolen	N/A	Any	X	X	Non-Customer	Tag Violation



A.3.3.2 DRBA Toll Evasion Tag/Account Status

Table A-35 DRBA Toll Evasion Tag/Account Status

Account Status	Device Status	Speed Suspension?	Account Balance	Image Capture	Image Review	Notice Type	Violation Type
Closed	-		N/A	X	X	Non-Customer	Tag Violation
Closed Pending	-		Any	X	X	Non-Customer	Tag Violation
Good	Active		>Replenishment Threshold			N/A	N/A
Good	Active	X	>Replenishment Threshold	X		Customer	Customer Violation
Low Balance	Active		>(-\$14.99) and <Replenishment Threshold			N/A	N/A
Low Balance	Active		<(-\$14.99)	X		Customer	Negative Balance Violation
Low Balance	Active	X	>(-\$14.99) and <Replenishment Threshold	X		Customer	Customer Violation
Low Balance	Active	X	<(-\$14.99)	X		Customer	Customer Violation
Revoked Warning	Active		<(-\$14.99)	X		Customer	Customer Violation
Revoked Warning	Active	X	<(-\$14.99)	X		Customer	Customer Violation
Revoked Final	Active		<(-\$14.99)	X	X	Non-Customer	Tag Violation
N/A	Retained	N/A	N/A	X	X	Non-Customer	Tag Violation
N/A	Defective	N/A	N/A	X	X	Non-Customer	Tag Violation
N/A	Inventory	N/A	N/A	X	X	Non-Customer	Tag Violation
Any	Lost	N/A	Any	X	X	Non-Customer	Tag Violation
N/A	Returned	N/A	N/A	X	X	Non-Customer	Tag Violation
Any	Stolen	N/A	Any	X	X	Non-Customer	Tag Violation



A.3.3.3 NYSTA Toll Evasion Tag/Account Status

Table A-36 NYSTA Toll Evasion Tag/Account Status

Account Status	Device Status	Speed Suspension?	Account Balance	Image Capture	Image Review	Notice Type	Violation Type
Closed	-	No	N/A	X	X	Non-Customer	Tag Violation
Closed Pending	-	No	Any	X	X	Non-Customer	Tag Violation
Good	Active	No	>Replenishment Threshold			N/A	N/A
Good	Active	X	>Replenishment Threshold			Customer	Customer Violation
Low Balance	Active	No	>(-\$14.99) and <Replenishment Threshold			N/A	N/A
Low Balance	Active	No	<(\$14.99)			Customer	Negative Balance Violation
Low Balance	Active	X	>(-\$14.99) and <Replenishment Threshold			Customer	Customer Violation
Low Balance	Active	X	<(-\$14.99)			Customer	Customer Violation
Revoked Warning	Active	No	<(-\$14.99)			Customer	Customer Violation
Revoked Warning	Active	X	<(-\$14.99)			Customer	Customer Violation
Revoked Final	Active	No	<(-\$14.99)	X	X	Non-Customer	Tag Violation
N/A	Retained	N/A	N/A	X	X	Non-Customer	Tag Violation
N/A	Defective	N/A	N/A	X	X	Non-Customer	Tag Violation
N/A	Inventory	N/A	N/A	X	X	Non-Customer	Tag Violation
Any	Lost	N/A	Any	X	X	Non-Customer	Tag Violation
N/A	Returned	N/A	N/A	X	X	Non-Customer	Tag Violation
Any	Stolen	N/A	Any	X	X	Non-Customer	Tag Violation
N/A	Test	N/A	N/A	X	X	Non-Customer	Tag Violation



A.3.3.4 Maryland Toll Evasion Tag/Account Status

Table A-37 Maryland Toll Evasion Tag/Account Status

Account Status	Device Status	Speed Suspension?	Account Balance	Image Capture	Image Review	Notice Type	Violation Type
Closed	-	No	N/A	X	X	Non-Customer	Tag Violation
Closed Pending	-	No	Any	X	X	Non-Customer	Tag Violation
Good	Active	No	>Replenishment Threshold			N/A	N/A
Good	Active	X	>Replenishment Threshold			Customer	Customer Violation
Low Balance	Active	No	>(\$0) and <Replenishment Threshold			N/A	N/A
Low Balance	Active	No	<(\$0)			Customer	Negative Balance Violation
Low Balance	Active	X	>(\$0) and <Replenishment Threshold			Customer	Customer Violation
Low Balance	Active	X	<(\$0)			Customer	Customer Violation
N/A	Defective	N/A	N/A	X	X	Non-Customer	Tag Violation
N/A	Inventory	N/A	N/A	X	X	Non-Customer	Tag Violation
Any	Lost	N/A	Any	X	X	Non-Customer	Tag Violation
N/A	Returned	N/A	N/A	X	X	Non-Customer	Tag Violation
Any	Stolen	N/A	Any	X	X	Non-Customer	Tag Violation
N/A	Test	N/A	N/A	X	X	Non-Customer	Tag Violation



A.3.3.5 NJTA Toll Evasion Tag/Account Status

Table A-38 NJTA Toll Evasion Tag/Account Status

Account Status	Device Status	Speed Suspension?	Account Balance	Image Capture	Image Review	Notice Type	Violation Type
Closed	-	N/A	N/A	X	X	Non-Customer	Tag Violation
Closed Pending	-	N/A	Any	X	X	Non-Customer	Tag Violation
Good	Active	N/A	>Replenishment Threshold	No	N/A	N/A	N/A
Low Balance	Active	N/A	>(-\$14.99) and <Replenishment Threshold	No	N/A	N/A	N/A
Low Balance	Active	N/A	<(-\$14.99)	X	N/A	Customer	Negative Balance Violation
Revoked Warning	Active	N/A	<(-\$14.99)	X		Customer	Customer Violation
Revoked Final	Active	N/A	<(-\$14.99)	X	X	Non-Customer	Tag Violation
N/A	Retained	N/A	N/A	X	X	Non-Customer	Tag Violation
N/A	Defective	N/A	N/A	X	X	Non-Customer	Tag Violation
N/A	Inventory	N/A	N/A	X	X	Non-Customer	Tag Violation
Any	Lost	N/A	Any	X	X	Non-Customer	Tag Violation
N/A	Returned	N/A	N/A	X	X	Non-Customer	Tag Violation
Any	Stolen	N/A	Any	X	X	Non-Customer	Tag Violation



A.3.4 Image Reject Codes

If the image review staff is unable to positively identify a license plate one of the following agency specific reject codes are loaded into VECTOR. The following table lists the agency specific reject codes.

Table A-38 Image Reject Codes

Reject Code	Description	E-ZPass	MDTA	DRBA	NJTA
		All Agencies			
BRIT	Too bright.	X	X	X	X
DARK	Too dark	X	X	X	X
CORR	Corrupt. Possible reasons: multiple copies of same image; no overlay; corrupt overlay; overlay does not match image header; portion or all of image is blacked out, snow distorted, or contains sunspots.	X	X	X	X
ALGN	Camera is out of alignment	X	X	X	X
RJNV	No vehicle in image; camera properly aligned	X	X	X	X
RJPL/NOPL	Plate blurry, out of focus, or contrast is low.	X	X	X	X
N/A	Can't determine the state of plate; the plate is a special plate like Purples Heart, etc.				
NOTR	Image has no matching violation transaction. Note: This is an image reject prior to image review.	X		X	X
RMMH	Corrupt. Possible reasons: multiple copies of same image; no overlay; corrupt overlay; overlay does not match image header; portion or all of image is blacked out, snow distorted, or contains sunspots.				
RMMP/PLMM	Plate mismatch - Front and rear license plates do not match for vehicles other than tractor-trailers.	X		X	X
RUNN	Cameras out of alignment, including: Vehicle or part of vehicle on image but plate is cut off to side, top, or bottom; camera not pointing at lane but at curb or canopy.				
OBST	Plate is obstructed	X	X	X	X
STAT	Can't determine the state of the plate	X	X	X	X
ROFF	Emergency vehicle - ambulance, fire truck or police. Note: Authority vehicles are not to be rejected.	X	X	X	X
WEAT	Weather conditions, including a license plate obstructed by snow, a snow plow is in the lane, or a person is shoveling in the lane.	X	X	X	X
TRLR	Commercial vehicle pulling trailers, unable to get 'cab' license plate due to not having front cameras installed at facilities.		X		

A.3.5 DMV Agreements

Agencies participating in the IAG, share customer information via a daily file transfer. As images are captured, VECTOR executes a process to determine to whom the license plate belongs. VECTOR stores Home Agency customer license plate information. When a violator is identified as an IAG customer, the transaction information is sent to the customer's Home Agency for reconciliation. If a non-customer is identified as a violator, VECTOR checks to see if the customer belongs to another agency. If the customer's license plate information cannot be found, a request for the name and address of the vehicle owner is made to the DMV. To avoid a fee, an agency must enter into an agreement with their home state. This allows them access to a free look-up service. The following tables list the agency specific DMV agreements.

Table A-39 DMV Agreements

Agency Name	State	Multiple requests	Vehicle make required
NYSTA	Connecticut		
	Florida		
	Massachusetts		
	Maryland		
	New Jersey	X	
	New York		
	Pennsylvania		
	Ontario		
	Quebec		
	Illinois		
	Virginia		
PANYNJ	Florida	X	
	Massachusetts	X	
	Maryland	X	
	New Jersey	X	
	New York		
	Pennsylvania		
	Illinois	X	
	Virginia	X	
DRBA	Delaware	X	
	Maryland	X	
	New Jersey	X	
	New York	X	
NJTA	Delaware		
	District of Columbia	X	
	Florida	X	
	Illinois	X	

	Maine	X	
	Maryland	X	
	Massachussetts	X	
	New Jersey	X	
	New York	X	
	North Carolina	X	
	Oklahoma	X	
	Pennsylvania	X	
	Tennessee	X	
	Virginia	X	



A.3.6 Toll Evasion Noticing Schemes

Violation noticing scheme can be agency specific. The following tables describe specific agency noticing schemes.

A.3.6.1 NYSTA – E-ZPass

Table A-40 NSTA-E-Zpass Toll Evasion Noticing Schemes

Agency	Notice Description	Escalation Level	Description
NYSTA	blank	First notice	Includes any new violation transaction(s). Fee is waived by the CSC for first occurrence on first notice if entire toll amount due is paid.
	Notice of Delinquency	Second notice	Includes violation toll(s) and fee(s) on first notice that have not been paid within 30 days of the first notice mailing date.
	Final Notice	Third notice	Includes violation toll(s) and fee(s) on second notice that have not been paid within 30 days of the Notice mailing date.
	Notice of Liability	NOL	Includes any violation transaction that occurs after an account has become eligible for NOL processing.

A.3.6.2 Port Authority – E-Zpass NY

Table A-41 Port Authority – E-Zpass NY Toll Evasion Noticing Schemes

Agency	Notice Description	Escalation Level	Description
Port Authority	Notice of Toll Violation – First Offense	First notice (first-ever)	Includes any new violation transaction(s) for a violator that has never before been issued a violation notice. The notice will advise the violator that fees will be waived if entire toll balance is paid within 15 business days of the notice mail-date.
	Notice of Toll Violation	First notice	Includes any new violation transaction(s) for a violator that was previously issued a notice.
	Second Notice of Toll Violation	Second notice	Includes violation toll(s) and fee(s) first notice that have not been paid within 30 days of the Notice mailing date.
	Final Notice of Toll Violation	Third notice	Includes violation toll(s) and fee(s) second notice that have not been paid within 30 days of the Notice mailing date.

A.3.6.3 Maryland

Table A-42 Maryland Toll Evasion Noticing Schemes

Notice Description	Escalation Level	Description
Notice of Toll Due	First notice	Includes any new violation transaction(s).
Notice of Liability	Second notice – Non-Payment	Includes violation toll(s) on Notice A and adds an administrative fee(s) for violation(s) that have not been paid within 15 days of the Notice A mailing date.
Notice of Liability	Second notice – Repeat Offender	Includes violation toll(s) and fee(s) as a result of a second toll violation.
Citation	Third notice – Non-Payment	Includes violation toll(s) and fee(s) on first and second notice and adds a civil penalty for violations that have not been paid within 15 days of the Notice mailing date.
Citation	Third notice – Repeat Offender	Includes violation toll(s), administrative fee(s), and a civil penalty for a 3rd or subsequent violation(s).

A.3.6.4 DRBA

Table A-43 DRBA Toll Evasion Noticing Schemes

Notice Description	Escalation Level	Description
blank	First notice	Includes any new violation transaction(s). Fee is waived for first occurrence on first notice if entire toll amount due is paid
Notice of Delinquency	Second notice	Includes violation toll(s) and fee(s) on Notice A that have not been paid within 30 days of the previous Notice mailing date.
Final Notice	Third notice	Includes violation toll(s) and fee(s) on Notice that have not been paid within 30 days of the previous Notice mailing date.

A.3.6.5 NJTA

Table A-44 NJTA Toll Evasion Noticing Schemes

Notice Description	Escalation Level	Description
Notice of Toll Violation – First Offense	First notice	The first notice will contain the violation image on the front of the notice, and the dispute form on the back of the notice, and shall contain all information currently provided as of the date of this contract.
Notice of Delinquency	Second notice	Second notices shall be sent, at the discretion of ACS, no later than 45 days after the mailing of the first notice, per violation.
Final Notice	Third notice	Images will not be included on the second and subsequent notices. All outstanding violations as of the date of the second notice are to be included in the notice.
Collection	Collection	Notices were sent one time during the pilot program.

A.3.7 Tolls and Fees

The following table describes the agency specific tolls and fees charged per transaction:

Table A-44 Agency Tolls and Fees

Agency	Notice Level	Toll	Fee per Transaction
PANYNJ	Tagged	Vehicle class per tag.	\$25
	Untagged	Vehicle class per AVC.	\$25
NYSTA	Tagged	Vehicle class per tag. Maximum toll for exit point if entry point is not known.	\$25.00.
	Untagged	Vehicle class group determined by image review (class 1 or non-class 1). Class 5 toll for non-class 1 vehicles. Maximum toll for exit point if entry point is not known.	\$25.00
Maryland	Notice of Toll Due	Full fare based on axles	None
	Notice of Liability – Non-Payment	Full fare based on axles	\$15 administrative fee
	Notice of Liability – Repeat Offense	Full fare based on axles	\$15 administrative fee
	Citation – Non-Payment	Full fare based on axles	\$15 administrative fee \$50 civil penalty
	Citation – Repeat Offense(s)	Full fare based on axles	\$15 administrative fee \$50 civil penalty
DRBA	Tagged	Higher of the AVC or tag rate. Except Tag Class 1 and AVC Class 2 where tag class is charged	\$25
	Untagged	Vehicle class per AVC.	\$25
NJTA	Tagged	Vehicle class per tag.	\$25.00
	Untagged		

A.3.8 Dismissals and Write-offs

The following tables list the agency specific dismissal codes that are entered by the CSRs into VECTOR when a violation fee is dismissed.

Table A-45 Dismissals and Write-offs

Agency	Dismissal Code	Description	Comments
All agencies	DCIF	Customer with insufficient funds	Problem with credit card; payment not made on time. Both the toll and the fee (if applicable) are dismissed and the correct toll is posted manually to the customer's account.
	DCST	Customer with valid account	A customer violation could be dismissed if their license plate number is not on their Home Agency account or the license plate on the account is incorrect. As a result, VECTOR does not identify the transaction as belonging to an E-ZPass customer and therefore cannot post the toll. Both the toll and the fee (if applicable) are dismissed and the correct E-ZPass toll is posted manually to the customer's account.
	DCSY	Courtesy	Agencies may decide to dismiss a toll and/or fee for a reason that is not represented by the other dismissal codes.
	DDMV	DMV license plate problem	Plate was turned in; plate was stolen; duplicate plates; etc.
	DISI	Image challenge	The violator challenges the violation and requests a review of the license plate image. Upon review, CSC determines that the license plate does not match the violator's plate and the violation is dismissed.
	DISS	Stolen vehicle	Vehicle was reported to the police as stolen.
	DNLM	Non-customer paid toll (left cash in lane)	"Violator" receives a violation then contacts the CSC claiming that they left cash at the lane but not with a toll collector. PANYNJ allows this dismissal once per customer.
	DNPC	Non-customer paid toll to toll collector	"Violator" receives a violation then contacts the CSC claiming that they paid a toll collector. Violator does not always have a receipt as proof. PANYNJ allows this dismissal twice per customer without a receipt – subsequent dismissals for this customer must include a receipt.
	DNRV	Non-revenue passage at direction of the Agency	Agency advises ACS that the violation should be dismissed due to the non-revenue status of the vehicle.
	DOTV	Dismissed fine – non-customer first-time violator	The CSC violations clerk, according to the CSC's policies and procedures, will apply this code manually.

Agency	Dismissal Code	Description	Comments
	DSKP	Skip read	Person has a valid ETC transaction and a matching violation transaction (e.g. PANYNJ cross lane reads, passbacks, etc). Most skip reads are filtered out by VECTOR prior to image review. For PANYNJ, these transactions will be returned with a reconciliation code. For skip read transactions that are found post-image review, any tolls and fees will be dismissed using the DSKP code. This might be more common with reciprocity (Consortium customer receives skip read and violation on NYSTA).
	DITR	Transfer responsibility	Violation is transferred from one account to another (e.g. license plate belongs to a rental agency).
	DISSPREPAY	Pre-paid violation	Violator sends payment for toll(s) to the CSC before receiving a violation notice. The CSC is able to match this toll payment to a specific violation notice and therefore must dismiss the transaction(s).
	DISSUND5	Automatic dismissal	
	DISSNIXIE	Dismissal for NIXIE, Retruned mail	
MD only	DISSVIP	Notice sent to VIP	Notice has been sent to VIP
NJ only	DIPC	Dismissed due to plate change	
	DISPPORT	Dismissed citation posted as toll	
	DISSUND10	Dismissal under 10 dollars	
	DISSWRITE OFF	Write-off after 6 months	
	REQCOURT	Request for court	

A.3.9 Court Hearing Schedule-NOL

A NOL is a legal document similar to a court citation. It is sent to toll evaders who incur a violation, and who have not paid or responded to a previous violation notice within the required time frame. Each agency can establish disposition codes to track the status of the NOL. The following table below shows the codes used to track the disposition of NOLs. This is an optional feature.

Table A-46 Court Hearing Schedule – Notice Of Liability

Agency	Disposition	Open Flag	Status Description
NYSTA only	DISM		Dismissed by court
	LATE		Late NOL generation
	LIAJ	X	Liability ordered
	LIDF	X	Did not appear (default)
	NEW		New NOL
	NOIM		No image available
	OPEN	X	NOL generated
	PDAD		Admitted, paid
	PDDF		Default, paid
	PDJD		Judgment, paid
	WITA		Withdrawal, Agency
	WITL		Withdrawal, ACS
	WITN		Withdrawal, name change
	WITR		Withdrawal, mail returned

A.3.10 Citation Disposition codes

The citation disposition codes are used to track the status of citations.

Table A-47 Citation Disposition Codes

Agency	Disposition	Open Flag	Status Description
MDTA	DISM		Dismissed by court
	LATE		Late NOL generation
	LIAJ	X	Liability ordered
	LIDF	X	Did not appear (default)
	NEW		New NOL
	NOIM		No image available
	OPEN	X	NOL generated
	PDAD		Admitted, paid
	PDDF		Default, paid
	PDJD		Judgment, paid
	WITA		Withdrawal, Agency
	WITL		Withdrawal, ACS
	WITN		Withdrawal, name change
	WITR		Withdrawal, mail returned
	PDCT		Judgment, Paid at Court
	OCRT	X	Open Court

A.3.11 Class Mismatch

Class mismatch transactions are toll transactions where the class of the vehicle detected by the AVC equipment does not match the class of the vehicle indicated by the tag. The following table describes the E-ZPass and MDTA business rules for class mismatch identification and processing.

Table A-48 Class Mismatch

CLMM Level	Tag Type = AVC Type	Mismatch	Description	Processing Rules for Confirmed CLMM	
				Number of Level 1 Notices per Account	Action
1	No	Tag Type < AVC Type	The type of vehicle as indicated by the tag does not match the type of vehicle as indicated by the AVC and the tag is for a lower fare than the AVC type.	1st	Warning notice sent to account holder
				2nd – 6th (excluding grace period notices)	Initial fee is \$10 per violation that is listed on the 2nd CLMM notice. For subsequent notices the fee will escalate in \$10 per violation per notice up to a maximum of \$50 on the 6th Level 1 notice (i.e. a \$50 fine is applied to each transaction on the customer's 6th notice). All fees are deducted from the customer's account balance.
				7th +	Notice plus \$50 fee sent to account holder.
				The toll amount charged to the account will be adjusted according to the vehicle type determined during image review.	
				An account (tag) that does not receive any Level 1 CLMM for a six-month period will be eligible to restart the notice cycle. For example, the next Level 1 mismatch (after a six-month period without a Level 1 CLMM) will trigger a warning notice.	
2	No	Tag Type > AVC Type	The type of vehicle as indicated by the tag does not match the type of vehicle as indicated by the AVC and the tag type is for a higher fare than the AVC type.	Image review is not required for this type of mismatch. The tag determines the toll charged to the account. Images are kept for resolving complaints on a case-by-case basis. Note: the PANYNJ does not indicate a mismatch in this case; AVC axle count is used to determine the fare.	
3	Yes (vehicle = car)	Tag and AVC number of axles do not match	Vehicle type indicated by both the tag and the AVC is a car. The mismatch is the number of axles indicated by the tag versus the number indicated by the AVC (e.g. a car towing a trailer).	The account is debited the proper amount according to image review and no further action is taken.	

CLMM Level	Tag Type = AVC Type	Mismatch	Description	Processing Rules for Confirmed CLMM
4	Yes (vehicle = truck or bus)	Tag and AVC number of axles do not match	Vehicle type indicated by both the tag and the AVC is a truck/bus. The mismatch is the number of axles indicated by the tag versus the number indicated by the AVC.	The account is debited the proper amount according to image review and no further action is taken. Note: the PANYNJ does not indicate a mismatch in this case; AVC axle count is used to determine the fare.



A.3.11.1 MTA Class Mismatch Processing

Table A-49 MTA Class Mismatch Processing

Tag Class (AVI)	AVC Class	Image	Letter	Fee Charged	CM Level
1	4-8, 11-13, 17-20	X	X	X	1
2	4-8, 11-13, 17-20	X	X	X	1
3	4-8, 11-13, 17-20	X	X	X	1
5	1-4, 6-9, 11-13, 15-21	X	X	X	1
9	1-8, 11-13, 15-20	X	X	X	1
11	1-4, 6-9, 12-13, 15-21	X	X	X	1
15	4-8, 11-13, 17-20	X	X	X	1
16	4-8, 11-13, 17-20	X	X	X	1
21	1-8, 11-13, 15-20	X	X	X	1
4	1-3, 9, 15, 16, 21	X			2
6	1-3, 9, 15, 16, 21	X			2
7	1-3, 9, 15, 16, 21	X			2
8	1-3, 9, 15, 16, 21	X			2
12	1-3, 9, 15, 16, 21	X			2
13	1-3, 9, 15, 16, 21	X			2
17	1-3, 9, 15, 16, 21	X			2
18	1-3, 9, 15, 16, 21	X			2
19	1-3, 9, 15, 16, 21	X			2
20	1-3, 9, 15, 16, 21	X			2
1	2, 3, 9, 15, 16, 21	X			3
2	1, 3, 9, 15, 16, 21	X			3
3	1, 2, 9, 15, 16, 21	X			3
4	5-8, 11-13, 17-20	X			3
6	4, 5, 7, 8, 11-13, 17-20	X			3
7	4-6, 8, 11-13, 17-20	X			3
8	4-7, 11-13, 17-20	X			3
9	21	X			3
11	5	X			3
12	4-8, 11, 13, 17-20	X			3
13	4-8, 11, 12, 17-20	X			3
15	1-3, 9, 16, 21	X			3
16	1-3, 9, 15, 21	X			3
17	4-8, 11-13, 18-20	X			3
18	4-8, 11-13, 17, 19, 20	X			3
19	4-8, 11-13, 17, 18, 20	X			3
20	4-8, 11-13, 17-19	X			3
21	9	X			3

A.3.11.2 PANYNJ Class Mismatch Processing

Table A-50 PANYNJ Class Mismatch Processing

AVC Class	PANYNJ Class Charged	Tag Class	Extra Axles Charged	CLMM Flag	CLMM Level (1=Notice)
7	Tag	1, 7	Tag	X	3
2-6	Tag	1, 7, 11	Tag	X	1
1-7	Tag	8, 9, 11	Tag	X	1
8, 9, 11	Tag	1, 7	Tag		N/A
2-6	AVC	2-6	AVC		N/A
1, 7, 8, 9, 11	Tag	2-6	Tag		N/A
8-9	AVC	8-9	AVC		N/A

The table below shows the categories and business rules for CLMM processing used in Maryland. Any CLMM violation will trigger an image capture. Only transactions where the tag type is less than the class indicated by the AVC equipment will cause an image review. For violations where the tag class is less than indicated at the lanes, the images will be stored for complaints on a case-by-case basis.

Table A-51 CLMM Processing

CLMM Level	Mismatch	Description	Processing Rules for Confirmed CLMM
1	Tag Type < AVC Type	The type of vehicle as indicated by the tag does not match the type of vehicle as indicated by the AVC and the tag is for a lower fare than the AVC type.	Image review is not required for this type of mismatch. The AVC classification determines the toll charged to the account. Images are kept for resolving complaints on a case-by-case basis.
2	Tag Type > AVC Type	The type of vehicle as indicated by the tag does not match the type of vehicle as indicated by the AVC and the tag type is for a higher fare than the AVC type.	Image review is not required for this type of mismatch. The AVC classification determines the toll charged to the account. Images are kept for resolving complaints on a case-by-case basis.

A.3.12 Speed

A speed violation occurs when a customer exceeds the agencies' speed thresholds. Speed enforcement will result in speed violation notices and the possible suspension or revocation of a customer's account (for private and non-revenue accounts) or tag (for business and commercial accounts). Unlike toll evasion or class mismatch notices, there are no fees associated with speed notices. To determine if a vehicle is speeding in a lane, agencies can configure speed thresholds on their facilities by plaza, lane, account type, and speed range. Specific agency thresholds are protected by each agency.

A.3.12.1 Speed Noticing and Sanctions

Agencies can generate notices and apply sanctions to speed violators. The agency specific business rules for noticing and sanctions are protected by each agency. DRBA has not implemented this functionality.

A.3.13 Toll Pricing/Toll Schedule

The process by which VECTOR computes the toll rate is called transaction posting. The calculations for toll rates are based upon agency business rules such as plans, toll schedules, holiday and congestion pricing.

Table A-53 Toll Pricing/Toll Schedule

Toll pricing	E-Zpass NY			MdTA	DRBA	NJTA
	MTA	NYSTA	PANYNJ			
<input type="checkbox"/> Holiday pricing	X	X	X		X	X
<input type="checkbox"/> Variable Pricing	X		X		X	X

Appendix B - Reports & Correspondence

B.1 Reports

VECTOR employs the powerful report generator, ACTUATE, to serve reports to its users. VECTOR reports, although premade or "canned," typically allow the user to enter additional filtering options when they are run, increasing their speed and utility.

VECTOR report categories include Transaction-Related, Reciprocity-Related and Finance-Related, Violations-Related, CSC Related, and Plaza Operations (plaza/host) Related as shown below. Additional reports may be created to satisfy a specific client's unique needs.

B.1.1 Transaction-Related Reports

Transaction-related reports are those that show the status of transactions at various stages of the processing flow. They are principally used to check system performance and to provide volume/usage information.

<u>Number</u>	<u>Report Title or Name</u>
16	Late Toll Transaction Report
21	Average Tolls Charged Report
24	Transaction Not Posted Report
31	Non-Revenue Tag Use Report
43	Manually Posted Tolls Report
54	Usage Day Report
60	Tolls Posted by Collection Date (TCR Tolls Posted) Report
61	Resident Usage at Crossing Report
07N	Unmatched Handler Report
32A	Non-Revenue Calendar Month Tag Use Summary Report
41B	Manual Tolls Posted From Logs Report
Q15	Transaction Reconciliation Report
Q4P/Q5M	Toll by Lane/Plaza Report
Q3M	ATP Statistics Report

B.1.2 Reciprocity-Related Reports

Reciprocity-related reports provide information on the transactions received from or sent to other participating Agencies, including information on reconciliation information on what transactions were posted to customer accounts. The following Reciprocity Reports provide information related to the IAG Specifications Document.

<u>Number</u>	<u>Report Title or Name</u>
63	Inter CSC Settlement Report
64	Inter CSC Confirmation Settlement Report
66	Inter CSC Rejection Transactions Report
67	NPST Report
68	Inter-CSC Reconciliation Aging Report
69	Local Use Report
77A	Inter CSC Toll Transaction Reconciliation Report
77B	Inter-CSC Settlement Report
Q8M	Causal Use Report
81A	Inter CSC Correction Reconciliation Report
81B	Inter-CSC Correction Reconciliation Report
81C	Inter-CSC Rejected Corrections Report
46	File Transmission Report
46B	Inter Agency Bad Acknowledgement Report

B.1.3 Finance-Related Reports

Finance-related reports provide information to assist in the process of collecting and distributing revenue for the toll collection system. They principally deal with customer billing and payments, sources of revenues and transfers to other Agencies.

<u>Number</u>	<u>Report Title or Name</u>
30	Replenishment Distribution Report
49	Revenue Detail Report
55	PDR - Detail
56	PDR – Summary of Deposit Report
57	PDR-Summary by Payment Type Report
58	PDR Summary by Transaction
62	Reimbursement Account Activity Report
65	Automated Rebill Summary Report
18A	Negative Account Balance Report
18B	Top X Negative Balance Accounts
22A	Distribution of Funds Report
22B	Average Replenishment Report
48B	Receipts by Agency and Category Report
F1M	Daily CC Reconciliation/Auto CC Replenishment Report
F3M	Processor Reconciliation Report
F4N-F22	Monthly Check Refund
Q11	Sales/Payment Daily Summary Report
Q13	Revenue Reconciliation Report
Q14	Refund Report
Q16	Commuter Plan Reconciliation Report
R02	Retailer Invoice Report

B.1.4 Violations-Related Reports

Violation-related reports provide information to assist the process of identifying and tracking violators of the toll collection system, and their noticing and payment.

<u>Number</u>	<u>Report Title or Name</u>
25	Speed Violation Notification Report
26	Speed Appeals Summary Report
33	Violation Image Processing
34	Toll Violations and Mismatches by Plaza/Lane Report
36A	Imaging Review Statistics / Imaging to Noticing Report
36B	Image Review Statistics
36C	Image Review Statistics
38	Violation Payments by Plaza Report
38S	Violation Billing By Plaza
40	Administrative Violations Notices by Status Report
41	Tolls Posted From Images Report
42	NOL by Court Report
35A	Summary of Rejected Violation Transactions Report
35C	Image Review Statistics Report
44A	Class Mismatch by Plaza/Lane Report
44B	Class Mismatch Top 100 Report
55B	PDR Violations Accounts Receivable
VINP	Violation Status (Daily, Weekly, Monthly) Toll Evasion Reports
V2	Class Mismatch Adjustments Report
V3	Monthly Toll Evasion Summary Report
VIN	FAST Report
V2N	(Agency Name) Non-Revenue Speed Violation Report
V4	Reviewer Summaary Report

B.1.5 CSC-Related Reports

CSC-related reports provide information on the sale of devices, the distribution and status of devices, and the status of individual customer accounts.

<u>Number</u>	<u>Report Title or Name</u>
01	Tag Order / Receive Control Sheet
6	Distribution of Tags by Age Report
12	CSC Activity Report
13	Application Processing Report
15	Payments Updated to the System Report
17	Statement Production Report
28	Unauthorized Non Revenue Tag Use Report
59	Purchase Order Receipt Report
76	Unassigned Tag Listing Report
78	Control Totals
05N	Business / Commercial Post Paid Tag Reconciliation Report
10A	Outgoing Mail Tracking Log
10B	Incoming Mail Tracking Log
11A	Mail Processing in Queue Report
11B	Mail Processing and Tag Distribution Report
4A	Tag Distribution Tracking Report
4B	Active Tag Distribution by IAG Class Report
5A	Tag Activity Report
5B	Account Plan Status Report
5C	Low Hand Shake Report
O8N	Annual Permit Sales Report
Q12	Tag Sales by Account Plan Report
R01-A	Summary of Inventory by Retailer
R01-B	Detail of Inventory by Retailer
R03	Unregistered Retail Tags
S2A	Tag Activity Report
S2B	Tag Inventory by Color Report
	On Demand Statement

B.1.6 Plaza/Host-Related Reports

Plaza/Host-related reports generate information on the performance, revenue, and lane message activity of the toll collection process, and on employee security, scheduling, and revenue bag assignment, as well as data on the status of vaults and bank deposit bags.

<u>Number</u>	<u>Report Title or Name</u>
Host0014	Daily Facility Summary Report
Host0027	Revenue Bag Status Report
Host0002	Daily Settlement by Collector Report
Host0001	Collector Tour of Duty Report
Host0003A	Daily Collector Report
Host0003B	Daily Collector Report (Vehicle/Axle Summary)
Host0005	Record of Traffic Volume and Toll Collections Report
Host0017	Record of Toll Collection Report
Host0016	Detailed Transaction Report
Host0019	Record of Traffic Volume Report
Host0006	Toll Facility Overage and Shortage Report – Summary by Day
Host0018	Toll Facility Overage and Shortage – Summary by Collector
Host0020	Toll Facility Overage and Shortage Report – Summary
Host0025	No Class Report
Host0024	Employee Identification Report
Host0023	Denomination Breakdown Report
Host0015	Unusual Occurrence Report
Host0026	Revenue Bag Assignment Report
Host0029	Daily Utility Summary by Day/Lane/Dir/Hour Report
Host0009	Monthly Traffic Statistics Report – By Lane
Host0010	Monthly Traffic Statistics Report – By Day & Plaza
Host0011	Monthly Traffic Statistics Report – By Lane & Day
Host0021	Lane Utilization Summary Report
Host0008	Monthly Vehicle Traffic Statistics Report – By Hour
Host0013	ETC Posting Report

B.2 Correspondence

VECTOR contains an automated correspondence system that provides a level of professionalism and consistency to the customers. A correspondence system can be a powerful tool for communication of account information, program changes, or current events. From this system letters can be generated to all customers, groups of customers, or any individual customer.

VECTOR provides the capability to generate mail to every customer or target a mailing based on zip codes, usage volumes, replenishment method, upcoming credit card expiration dates, or other criteria that can be identified on the database. Other letters can be initiated automatically upon entry of specific transactions, such as a returned check.

CSRs are able to respond to customer inquiries with a series of system-generated form letters. Typical use of the correspondence system is to advise customers of inquiry resolution or to request specific information from the customer.

CSRs have a catalogue of standardized letters, which can be initiated by inputting a code, which represents the letter, into the customer's account record. Letters can be sent to violators as well as ETC customers, allowing flexibility in the violation administration function.

The correspondence system allows on-site Service Center staff to enter or revise letter text when needed.

Paragraphs that follow list the various items of correspondence generated by each VECTOR subsystem.

B.2.1 CAMS Correspondence

The list shown below comprises the various correspondence generated by CAMS.

Title/Name of Correspondence

Phone in Account Profile
Walk In Account Profile
Phone In Account Profile
Business Account Profile
Post Paid Account Profile
Commercial Profile for Vehicle and Tags
WMATA Account Profile
Account Adjustment
Application Returned
Close Account - Incomplete Information
Close Account - Negative Balance Due to Missing Tags
Close Account Request Form
Credit Card Authorization Letter (Phone Enrollment/Fax Back)
Phone Enrollment Credit Card Authorization - Second Notice
Phone Enrollment Credit Card Authorization - Final Notice
Proof of Residency (Grand Island Resident) Inc. Application
Proof of Residency (Grand Island Resident) No Longer Eligible
Proof of Residency (SI/RockWay) Denied Application
Proof of Residency (SI/RockWay) Inc. Application
Rockaway Resident - Valid Sticker
Sticker Owner / Application Certification
ThruWay Annual Permit Plan - Denied Refund, of Permit Fee
ThruWay Annual Permit Plan - Renewal Form
Unable to Reach By Phone
Sticker Assignment
Inactive Account Letter

B.2.2 FPMS Correspondence

The list shown below comprises the various correspondence generated by FPMS, including their VECTOR system identification number and their title or name:

<u>Number</u>	<u>Title/Name of Correspondence</u>
2	Replenishment Initial Evaluation
3	Replenishment Periodic Evaluation
8	Credit Card Denied
15	Revocation Warning Letter
16	CC Signature Exception
47	Credit Card Decline Replenishment
48	Replenishment Re-Evaluation Cash/Check
49	DP500 Renew NY12
51	Incomplete Correspondence Letter
52	Insufficient Funds First Notice
53	Insufficient Funds - Second Notice
54	Insufficient Funds - Final Notice
55	Insufficient Funds - Business Final Notice
56	Multiple Charges Authorization
57	One Time Replenishment Authorization
68	Unable to Process Check
69	Unable to Process Violation Check
2237102	Credit Card Expiration Letter

B.2.3 VEMS Correspondence

The list shown below comprises the various correspondence generated by VEMS, including their VECTOR system identification number and their title or name:

ID	Short Description	Long Description	Agency	Citation Type
1	PAA1	Port Authority First Notice Ever	Port	TE
2	PAA2	Port Authority First Notice	Port	TE
3	PAB	Port Authority Second Notice	Port	TE
4	PAC	Port Authority Third Notice	Port	TE
5	NYA	NYSTA First Notice	NYSTA	TE
6	NYB	NYSTA Second Notice	NYSTA	TE
7	NYC	NYSTA Third Notice	NYSTA	TE
8	NOL	NYSTA Notice Of Liability	NYSTA	TE
9	WRNP	Speed Warning Private		SPEED
10	WRP2	Subsequent Speed Warning Private		SPEED
11	S60P	Speed 60 Day Suspension Private		SPEED
12	180P	Speed 180 Day Suspension Private		SPEED
13	RVKP	Speed Revocation Private		SPEED
14	WRNB	Speed Warning Business		SPEED
16	S60B	Speed 60 Day Suspension Business		SPEED
17	180B	Speed 180 Day Suspension Business		SPEED
18	365B	Speed 365 Day Suspension Business		SPEED
19	WARN	Class Mismatch Warning	PORT	Class Mismatch
20	FINE	Class Mismatch Fine	PORT	Class Mismatch
22	WRNF	Speed Warning Fleet	NYSTA	SPEED
23	PACOLL	Sent record to coltek for collection of due amount.	PORT	TE
24	DBA	DRBA First Notice	DRBA	TE
25	DBB	DRBA Second Notice	DRBA	TE
26	DBC	DRBA Third Notice	DRBA	TE
27	MDA	MdTA First Notice Ever, NTD	MDTA	TE
28	MDB1	MdTA Second Notice, NOL	MDTA	TE
29	MDB2	MdTA NOL, Repeat offender (Direct Escalation)	MDTA	TE
30	MDC	MdTA Third Notice, Civil Citation	MDTA	

B.2.4 SAMS Correspondence

The list shown below comprises the various correspondence generated by SAMS, including their VECTOR system identification number and their title or name:

<u>Number</u>	<u>Title or Name of Correspondence</u>
35	PIN and Password

B.2.5 DIMS Correspondence

The list shown below comprises the various correspondence generated by DIMS, including their VECTOR system identification number and their title or name:

<u>Number</u>	<u>Title or Name of Correspondence</u>
34	Label Request
50	Extra Velcro

Appendix C - Tables

C.1 IAG Vehicle Class Information

	Vehicle Type	Axles	Num. Tires	Dual Tires	Over 7,000 lbs.	IAG Class
Automobile/ Sport Utility (with possible trailer)	1	2	4	N	N	72
	1	3	6	N	N	76
	1	4	8	N	N	80
	1	5	10	N	N	84
Motorcycle (with possible sidecar or trailer)	2	2	2	N	N	136
	2	3	3	N	N	140
	2	4	>3	N	N	144
Pick-Up Truck (with possible trailer)	3	2	4	N	N	200
	3	2	4	N	Y	202
	3	2	6	Y	N	201
	3	2	6	Y	Y	203
	3	3	6	N	N	204
	3	3	6	N	Y	206
	3	3	>= 8	Y	N	205
	3	3	>= 8	Y	Y	207
	3	4	8	N	N	208
	3	4	8	N	Y	210
	3	4	>= 10	Y	N	209
	3	4	>= 10	Y	Y	211
	3	5	10	N	N	212
	3	5	10	N	Y	214
	3	5	>= 12	Y	N	213
3	5	>= 12	Y	Y	215	
Passenger/ Cargo Van (seating 1-9 passengers)	4	2	4	N	N	264
	4	2	4	N	Y	266
	4	2	6	Y	N	265
	4	2	6	Y	Y	267
	4	3	6	N	N	268
	4	3	6	N	Y	270
	4	3	8-10	Y	N	269
	4	3	8-10	Y	Y	271

	Vehicle Type	Axles	Num. Tires	Dual Tires	Over 7,000 lbs.	IAG Class
Minibus/ Team Van/ Stretch Limo (seating 10-15 passengers)	5	2	4	N	N	328
	5	2	4	N	Y	330
	5	2	6	Y	N	329
	5	2	6	Y	Y	331
	5	3	6	N	N	332
	5	3	6	N	Y	334
	5	3	8-10	Y	N	333
	5	3	8-10	Y	Y	335
Buses (seating 16 or more passengers)	6	2	4	N	N	392
	6	2	4	N	Y	394
	6	2	6	Y	N	393
	6	2	6	Y	Y	395
	6	3	6	N	N	396
	6	3	6	N	Y	398
	6	3	8-10	Y	N	397
	6	3	8-10	Y	Y	399
	6	4	8	N	N	400
	6	4	8	N	Y	402
	6	4	>= 10	Y	N	401
	6	4	>= 10	Y	Y	403
Recreational Vehicle/ Motor Home	7	2	4	N	N	456
	7	2	4	N	Y	458
	7	2	6	Y	N	457
	7	2	6	Y	Y	459
	7	3	6	N	N	460
	7	3	6	N	Y	462
	7	3	8-10	Y	N	461
	7	3	8-10	Y	Y	463
	7	4	8	N	N	464
	7	4	8	N	Y	466
	7	4	>= 10	Y	N	465
	7	4	>= 10	Y	Y	467
Truck	8	2	4	N	N	520
	8	2	4	N	Y	522
	8	2	6	Y	N	521
	8	2	6	Y	Y	523
	8	3	6	N	N	524
	8	3	6	N	Y	526
	8	3	8-10	Y	N	525
	8	3	8-10	Y	Y	527
	8	4	8	N	N	528
	8	4	8	N	Y	530
	8	4	>= 10	Y	N	529
	8	4	>= 10	Y	Y	531
	8	5	10	N	N	532
	8	5	10	N	Y	534
	8	5	>= 12	Y	N	533
	8	5	>= 12	Y	Y	535
8	6	12	N	N	536	

	Vehicle Type	Axles	Num. Tires	Dual Tires	Over 7,000 lbs.	IAG Class
	8	6	12	N	Y	538
	8	6	>= 14	Y	N	537
	8	6	>= 14	Y	Y	539
	8	7	14	N	N	540
	8	7	14	N	Y	542
	8	7	>= 16	Y	N	541
	8	7	>= 16	Y	Y	543
Auto Transporter (up to 65')	9	3	n/a	Y	Y	591
	9	4	n/a	Y	Y	595
	9	5	n/a	Y	Y	599
	9	6	n/a	Y	Y	603
	9	7	n/a	Y	Y	607
Auto Transporter (over 65')	10	4	n/a	Y	Y	659
	10	5	n/a	Y	Y	663
	10	6	n/a	Y	Y	667
	10	7	n/a	Y	Y	671
Tractor Trailer Combination (trailer <= 48')	11	3	n/a	Y	Y	719
	11	4	n/a	Y	Y	723
	11	5	n/a	Y	Y	727
	11	6	n/a	Y	Y	731
	11	7	n/a	Y	Y	735
Tractor Trailer Combination (trailer > 48')	12	3	n/a	Y	Y	783
	12	4	n/a	Y	Y	787
	12	5	n/a	Y	Y	791
	12	6	n/a	Y	Y	795
	12	7	n/a	Y	Y	799
Tandem Trailer Combination (each trailer <= 28.5')	13	5	n/a	Y	Y	855
	13	6	n/a	Y	Y	859
	13	7	n/a	Y	Y	863
	13	8	n/a	Y	Y	867
	13	9	n/a	Y	Y	871
	13	10	n/a	Y	Y	875
Tandem Trailer Combination (each trailer > 28.5')	14	5	n/a	Y	Y	919
	14	6	n/a	Y	Y	923
	14	7	n/a	Y	Y	927
	14	8	n/a	Y	Y	931
	14	9	n/a	Y	Y	935
	14	10	n/a	Y	Y	939
Tandem Trailer Combination (one trailer <= 28.5' other > 28.5')	15	5	n/a	Y	Y	983
	15	6	n/a	Y	Y	987
	15	7	n/a	Y	Y	991
	15	8	n/a	Y	Y	995
	15	9	n/a	Y	Y	999
	15	10	n/a	Y	Y	1003
Tractor/ Mobile Home Combination	17	3	n/a	Y	Y	1103
	17	4	n/a	Y	Y	1107
	17	5	n/a	Y	Y	1111
	17	6	n/a	Y	Y	1115
	17	7	n/a	Y	Y	1119

	Vehicle Type	Axles	Num. Tires	Dual Tires	Over 7,000 lbs.	IAG Class
	17	8	n/a	Y	Y	1123
	17	9	n/a	Y	Y	1127
	17	10	n/a	Y	Y	1131



C.2 VECTOR Account Status Codes

Code Type	ID	Short Description	Long Description
ACCT_ACT_STATUS			
	0		
	1	PENDING	PENDING
	2	NEW	NEW
	3	ACTIVE	ACTIVE
	4	CLOSE PEND	CLOSE PEND
	5	CLOSED	CLOSED
	6	SUSPEND	SUSPEND
ACCT_FIN_STATUS			
	0	PENDPAY	PENDPAY
	1	GOOD	GOOD
	2	LOW	LOW
	3	ZERO	ZERO
	4	CLOSE PEND	CLOSE PEND
	5	RVKW	RVKW
	6	RVKF	RVKF
	7	NAUN	NAME & ADDRESS NOT AVAILABLE
SPEED_STATUS			
	0	NONE	NONE
	1	GOOD	GOOD
	2	WARN	WARNING
	3	SUSPEND1	Suspended 60 days
	4	SUSPEND2	Suspended 180 days
	5	SUSPEND3	Suspended 365 days
	6	REVOKED	REVOKED 1 YEAR
SUBACCOUNT_STATUS			
	1	PENDING	PENDING
	2	NEW	NEW
	3	ACTIVE	ACTIVE
	4	CLOSE PEND	CLOSE PEND
	5	CLOSED	CLOSED
	6	SUSPEND	SUSPEND

C.3 VECTOR Agency Codes

Vector Agency ID	Vector Agency	IAG Agency ID	Agency Short Title
1.	NY	004	New York State Thruway (NYSTA)
2.	TB	008	MTA B&T
3.	PA	005	Port Authority of NY & NJ (PANYNJ)
4.	NB	018	New York State Bridge Authority (NYSBA)
5.	NJ	022	New Jersey Regional Consortium*
6.	SJ	007	South Jersey Transportation Authority*
7.	MdTA	016	Maryland Transportation Authority (MdTA)
8.	DDOT	019	Delaware DOT (DeIDOT)*
9.	MPK	021	Massachusetts Turnpike Authority*
10.	WVA	024	West Virginia Parkways Authority*
11.	NJHA	002	New Jersey Highway Authority*
12.	NJTA	003	New Jersey Turnpike Authority*
13.	PTC	006	Pennsylvania Turnpike Commission
14.	MCD	130	McDonalds
15.	DMB	025	Delaware River and Bay Authority (DRBA)
16.	ALB	128	Albany Airport
17.			
18.	PBA	1.33d	Peace Bridge, New York (PBA)

* Reciprocal Agency not maintained by ACS

** Pre-VECTOR implementation reciprocal Agency maintained by ACS

C.4 VECTOR Agency Information

Parent	Agency Name	Current IAG Version	Minimum Rebill Amount	Initial Rebill Evaluation Period	Rebill Evaluation Rebill Period	Tag Prefix Number	Implements Scheduled Pricing	Implements Class Mismatch
Albany Airport	Albany Airport	1.33d	\$5.00	35	3	128	N	N
Delaware River and Bay Authority (DRBA)	Delaware River and Bay Authority	1.33d	\$5.00	35	3	025	N	N
Maryland Transportation Authority	Maryland Transportation Authority	1.33d	\$0.00	0	0	016	N	N
McDonalds	McDonalds	1.33d	\$5.00	35	3	130	N	N
MTA B&T	MTA B&T	1.51	\$5.00	35	3	008	N	Y
New York State Thruway	New York State Thruway	1.51	\$5.00	35	3	004	Y	Y
NYSBA	NYSBA	1.51	\$5.00	35	3	018	N	N/A
Port Authority of NY & NJ	Port Authority of NY & NJ	1.51	\$5.00	35	3	005	Y	N

C.5 VECTOR Device Status Codes

Code Type	ID	Short Description	Long Description	Meaning
DEVICE_INVENTORY_STATUS	1	INVENTORY	PENDING	Device is in inventory and is ready to be assigned to a customer
	2	ASSIGNED	NEW	A new device is assigned to a customer
	3	CLOSE PEND	CLOSE PEND	Device is closed
	4	RETURNED	RETURNED	Device is returned, but can be reassigned.
	5	DAMAGED	DAMAGED	Device is damaged.
	6	RETURNDEF	RETURNDEF	Device is returned defective.
	7	LOST	LOST	Device is lost.
	8	STOLEN	STOLEN	Device is reported stolen.
	9	SHIPVEND	SHIPVEND	Device is shipped back to the vendor.
	10	TESTED	TESTED	Device is tested.
	11	RETAINED	RETAINED	Device is retained.
	12	SOLD	SOLD	Device is sold to a customer.

Code Type	ID	Short Description	Long Description	Meaning	IAG Validation Status Code	IAG Validation Status Description
DEVICE_STATUS	1	INVENTORY	INVENTORY	Device is in inventory and is ready to be assigned to a customer	4	Lost/Stolen
	2	NEW	NEW	A new device is assigned to a customer	4	Lost/Stolen
	3	ACTIVE	ACTIVE	Device is being used by a customer	1	Valid
	4	CLOSE PEND	CLOSE PEND	Device is closed	3	Invalid
	5	RETURNED	RETURNED	Device is returned, but can be reassigned.	4	Lost/Stolen
	6	DAMAGED	DAMAGED	Device is damaged.	4	Lost/Stolen
	7	RETURNDEF	RETURNDEF	Device is returned defective.	4	Lost/Stolen
	8	LOST	LOST	Device is lost.	4	Lost/Stolen
	9	STOLEN	STOLEN	Device is reported stolen.	4	Lost/Stolen
	10	SHIPVEND	SHIPVEND	Device is shipped back to the vendor.	4	Lost/Stolen
	11	TESTED	TESTED	Device is tested.	4	Lost/Stolen
	12	RETAINED	RETAINED	Device is retained.	4	Lost/Stolen
	13	SOLD	SOLD	Device is sold to a customer.		

C.6 VECTOR Violation Status Codes

Code Type	ID	Short Description	Long Description
CITATION_STATUS	0	TOBENOTICED	NIL (Vehicle has not be issued a citation for the violation.)
	1	PENDINGINFO	Pending Information (Upon receipt of all information, the citation will be issued.)
	2	TOBEGENE	To Be Generated
	3	SENTTOMH	Sent To Mail house
	4	OPEN	Open Citation (Nothing has been paid on the citation.)
	5	PAIDFULL	Paid Completely
	6	PAIDPART	Partially Paid
	7	DISMISSED	Dismissed
	8	TRXEXPDATE	TRX Expiration Date (Transaction Expiration Date)
	55	APPEALED	Appealed
	56	CLOSED	Closed
	57	EXPIRED	Expired
	58	DENIED	Customer appeal was denied
	59	JUSTIFIED	Customer appeal was granted
	102	DCSY	Courtesy
	103	DDMV	DMV License plate problem
	104	DISI	Image challenge
	105	DISS	Stolen vehicle
	106	DNLM	Non-customer paid toll (Left cash in the lane)
	107	DNPC	Non-customer paid toll to toll collector
	108	DNRV	Non-revenue passage at direction of authority
	109	DOTV	Dismissed fine – non-customer first time violator
	110	DSKP	Skip read
	111	DCST	Customer with valid account
	112	DCIF	Customer with insufficient funds
	113	SISSNIXIE	Dismissal for NIXIE, Returned mail
	149	DISSUND5	Dismissal under 5 dollars
	150	DISSPREPAY	Prepayment – Dismissed fee
	151	DISSWRITEOFF	Write-off after 6 Months
	152	DIPC	Dismissed due to plate change
	153	DITR	Dismissed due to transfer of responsibility
	154	REQCOURT	Request for court dates
	203	PRNTNOL	To be printed

Code Type	ID	Short Description	Long Description
	204	NEW	New NOL (Notice of Liability)
	205	NOLOPEN	NOL Generated (Notice of Liability Generated)
	301	DISM	Dismissed by court
	302	PDDF	Default, paid
	303	PDAD	Admitted, Paid.
	304	WITR	Withdrawal, Mail Returned.
	305	PDJD	Judgment, Paid.
	306	LATE	Late NOL Generated.
	307	WITA	Withdrawal, NYSTA.
	308	WITN	Withdrawal, Name Change.
	309	NIOM	No Image available.
	310	WITL	Withdrawal, ACS.
	311	LIAJ	Liability Ordered.
	312	LIDF	Did not appear, default.
	351	DISMFAST	Dismissed fast speed violation
	352	APPRFAST	Approved fast speed violation
	401	SENTTOCACOLL	Sent new record to coltek for collection of due amount.
	402	SENTTOCAPPMT	Sent updated part paid record to coltek for collection of due amount.
	403	SENTTOCAFPMT	Sent updated full paid record to coltek for collection of due amount.
	404	SENTTOCADISS	Sent dismissed record to coltek for collection of due amount.
	405	RECVFRCAPPMT	Received from Collection Agency Part payment
	406	RECVFRCAFPMT	Received from Collection Agency Full payment
CLASSMISMATCH_STATUS			
	1	WARN	Warning
	2	FINE	Fine
VIOL_PREPAYMENT_STATUS			
	1	OPEN	Open
	2	CLOSED	Closed
	3	CANCELLED	Cancelled
VIOL_STATUS_DAILY_TYPE			
	10000	1	1 Toll Evasion TX's Revd
	20000	1	2 To Be Debited From Account
	21000	2	2.1 With Image
	22000	2	2.2 Without Image
	30000	1	3 Debited from Account
	31000	2	3.1 With Image



Code Type	ID	Short Description	Long Description
	32000	2	3.2 Without Image
	35000	1	4 Unable To Debited from Account
	35100	2	4.1 With Image
	35200	2	4.2 Without Image
	36000	1	5 Reciprocity Transactions
	36050	2	5.1 To be Sent To Other Agency
	36100	2	5.2 Sent to Other Agency
	36200	2	5.3 Other Agn Trx. Posted
	36300	2	5.4 Unable to Debited from Acct at Other Agency
	40000	1	6 Authority Reject
	41000	2	6.1 With Image
	42000	2	6.2 Without Image
	50000	1	7 Txn Not Posted (Exceed Limit)
	51000	2	7.1 With Image
	52000	2	7.2 Without Image
	60000	1	8 Unprocessable Viol (Exceeded Limit)
	61000	2	8.1 With Image
	62000	2	8.2 Without Image
	70000	1	9 NegBal To Notice
	71000	2	9.1 With Image
	72000	2	9.2 Without Image
	80000	1	10 Images Waiting To Be Reviewed
	81000	2	10.1 Txns Batched - Pending Review
	82000	2	10.2 Txns to be Batched
	85000	1	11 Txns with No Image
	90000	1	12 Images Reviewed
	91000	2	12.1 Images Rejected
	91100	3	12.1.1 Emergency Vehicle
	91200	3	12.1.2 State / Plate
	91300	3	12.1.3 General
	92000	2	12.2 Images Accepted
	92005	3	12.2.1 Trx. To Be Processed by Lica
	92100	3	12.2.2 Customer DB
	92110	4	12.2.2.1 Find Match
	92120	4	12.2.2.2 Match Found
	92124	4	12.2.2.3 Unprocessable Lica Txns
	92126	5	12.2.2.3.1 Trx Exceeded Limit
	92130	4	12.2.2.4 To be Debited From Acct
	92140	4	12.2.2.5 Debited From Acct
	92145	4	12.2.2.6 Unable To Post To Acct
	92146	5	12.2.2.6.1 Trx Exceeded Limit



Code Type	ID	Short Description	Long Description
	92147	5	12.2.2.6.2 Other Ex. Poaching etc
	92151	4	12.2.2.7 Reciprocity Transactions
	92155	5	12.2.2.7.1 To be Sent To Other Agency
	92156	5	12.2.2.7.2 Sent to Other Agency
	92157	5	12.2.2.7.3 Other Agn Trx. Posted
	92158	5	12.2.2.7.4 Unable to Debited from Acct at Other Agency
	92159	5	12.2.2.7.5 Reciprocity Trx. to Be Processed
	92160	4	12.2.2.8 Noticed
	92200	3	12.2.3 Viol.DB
	92300	3	12.2.4 Name & Addr. Required
	92400	3	12.2.5 No DMV Agreement
	92500	3	12.2.6 DMV Requested (Req in transit)
	92600	3	12.2.7 Req. Returned
	92610	4	12.2.7.1 Plate Reject
	92620	4	12.2.7.2 Plate Accepted
VIOL_TX_STATUS			
	0	NILL	NILL Status
	1	MTAREVIEWIMG	MTA Review of image required
	2	TOLL	Violation posted as toll
	3	REVIEWIMG	Review of image required
	4	SETTOREVIEW	Image set to reviewed
	5	LICAVAIL	License obtained from image
	6	REQNAMEADDR	Requires name & address
	7	DMVREQUESTED	Requested DMV for name & address
	8	DMVREJTIMS	Rejected by DMV TIMS
	9	NAMEADDRUN	Name & address unavailable
	10	CITE	To be sent a citation
	11	NEEDOCR	OCR of image required
	12	SENTTOOCR	Image sent to OCR
	13	CTOL	Casual toll
	14	POSTTOACCT	Sent to ATP
	15	BACKFROMOCR	Image back from OCR
	16	LICATOACCT	Sent to ATP from LICA
	17	SENTTOPOST	Sent to ATP
	18	CANNOTREQST	Because of agency requirements, cannot request
	20	CITEREPEAT	Repeat Violator/Plate found in violation Database
	30	AVCCORRECT	Agree with AVC
	31	RECLASSED	TXN re-classified
	32	CLASSADJREQ	Class adjustment requested



Code Type	ID	Short Description	Long Description
	33	CLASSADJPOST	Class adjustment posted
	34	CLASSADJNOP	Class adjustment not posted
	35	UNMATCHSPD	Unmatched speed
	36	FINDMATCH	Find match
	37	MATCHFOUND	Match found
	38	WRITEICTX	Write to ICTX FILE
	39	SENTTOICTX	Write to ICTX FILE
	40	SENTTOITXC	Written to ITXC FILE
	48	NONEEDTOREV	No need to review the image
	49	IMGREVIEWED	MTA Image Reviewed - Not Class Mismatch Txn
	50	IMGREJECT	Image rejected
	51	IMGREJBRT	Image rejected, too bright
	52	IMGREJDARK	Image rejected, too dark
	53	IMGREJCORR	Image rejected, corrupt
	54	IMGREJALGN	Image rejected, camera out of alignment
	55	IMGREJRJNV	Image rejected, no vehicle
	56	IMGREJRJPL	Image rejected, plate blurry, out of focus or contrast is low
	57	IMGREJNOTR	Image rejected, image has no matching violation transaction
	58	IMGREJRMMP	Image rejected, plate mismatch – front and rear license plates do not match
	63	IMGREJSTAT	Image rejected, cannot determine the state of the plate
	64	IMGREJROFF	Image rejected, emergency vehicle – ambulance, fire truck, or police.
	65	IMGREJWEAT	Image rejected, weather conditions, including a plate obstructed by snow.
	66	IMGREJOBST	Image rejected, plate obstructed
	90	SPEEDPOACH	Speed Tandem Trn within 1 minute
	91	NODMVAGRMT	No Agreement With DMV For State On Txn
	92	NOPROCSPEED	Speed violations non postable
	93	NOPOSTCTOL	Inter-Agency Casual Use Toll Rejected
	94	INSUFFPAID	Insufficient funds paid
	95	NOPOSTACCT	Unable To Post Txn To Acct
	96	NOIMAGE	No Image Available For Violation After 30 Days
	97	AUTHREJ	Authorized rejection
	98	NOPOST30DAYS	Not posted to account – over thirty days
	99	UNPROCESS	Unprocessable violation
	101	MTANOTVTRAN	Not V transaction
	102	COLMISCLAS	Collector MIS classified

C.7 Class Codes

Note: These are general codes. They are not Agency specific.

	Vehicle Type	Axles	Num. Tires	Dual Tires	Over 7,000 lbs.	IAG Class	NYSTA (004)	PANYNJ (005)	MTA B&T (008)	MdTA (016)	NYSBA (018)
Automobile/ Sport Utility (with possible trailer)	1	2	4	N	N	72	1	1	1	2	1
	1	3	6	N	N	76	2	7	2	3	3
	1	4	8	N	N	80	4	7	3	4	4
	1	5	10	N	N	84	6	7	3	5	5
Motorcycle (with possible sidecar or trailer)	2	2	2	N	N	136	1	11	9	2	1
	2	3	3	N	N	140	2	7	21	3	8
	2	4	>3	N	N	144	4	7		4	8
Pick-Up Truck (with possible trailer)	3	2	4	N	N	200	1	1	1	2	1
	3	2	4	N	Y	202	1	1	4	2	1
	3	2	6	Y	N	201	4	2	1	2	2
	3	2	6	Y	Y	203	4	2	4	2	2
	3	3	6	N	N	204	8	7	2	3	3
	3	3	6	N	Y	206	8	7	6	3	3
	3	3	>= 8	Y	N	205	8	3	2	3	3
	3	3	>= 8	Y	Y	207	8	3	6	3	3
	3	4	8	N	N	208	4	7	7	4	4
	3	4	8	N	Y	210	4	7	7	4	4
	3	4	>= 10	Y	N	209	6	4	7	4	4
	3	4	>= 10	Y	Y	211	6	4	7	4	4
	3	5	10	N	N	212	6	7	8	5	5
3	5	10	N	Y	214	6	7	8	5	5	

	Vehicle Type	Axles	Num. Tires	Dual Tires	Over 7,000 lbs.	IAG Class	NYSTA	PANYNJ	MTA B&T	MdTA	NYSBA
							(004)	(005)	(008)	(016)	(018)
	3	5	>= 12	Y	N	213	7	5	8	5	5
	3	5	>= 12	Y	Y	215	7	5	8	5	5
Passenger/ Cargo Van (seating 1-9 passengers)	4	2	4	N	N	264	1	1	1	2	1
	4	2	4	N	Y	266	1	1	4	2	1
	4	2	6	Y	N	265	4	2	1	2	2
	4	2	6	Y	Y	267	4	2	4	2	2
	4	3	6	N	N	268	8	7	2	3	3
	4	3	6	N	Y	270	8	7	6	3	3
	4	3	8-10	Y	N	269	8	3	2	3	3
	4	3	8-10	Y	Y	271	8	3	6	3	3
Minibus/ Team Van/ Stretch Limo (seating 10-15 passengers)	5	2	4	N	N	328	4	1	1	2	1
	5	2	4	N	Y	330	4	1	4	2	1
	5	2	6	Y	N	329	8	2	1	2	2
	5	2	6	Y	Y	331	8	2	4	2	2
	5	3	6	N	N	332	6	7	2	3	3
	5	3	6	N	Y	334	6	7	6	3	3
	5	3	8-10	Y	N	333	6	3	2	3	3
	5	3	8-10	Y	Y	335	6	3	6	3	3
Buses (seating 16 or more passengers)	6	2	4	N	N	392	4	8	4	2	1
	6	2	4	N	Y	394	4	8	4	2	1
	6	2	6	Y	N	393	8	8	4	2	2
	6	2	6	Y	Y	395	8	8	4	2	2
	6	3	6	N	N	396	6	9	6	3	3
	6	3	6	N	Y	398	6	9	6	3	3
	6	3	8-10	Y	N	397	6	9	6	3	3



	Vehicle Type	Axles	Num. Tires	Dual Tires	Over 7,000 lbs.	IAG Class	NYSTA (004)	PANYNJ (005)	MTA B&T (008)	MdTA (016)	NYSBA (018)
	6	3	8-10	Y	Y	399	6	9	6	3	3
	6	4	8	N	N	400	7	9	7	4	4
	6	4	8	N	Y	402	7	9	7	4	4
	6	4	>= 10	Y	N	401	7	9	7	4	4
	6	4	>= 10	Y	Y	403	7	9	7	4	4
Recreational Vehicle/ Motor Home	7	2	4	N	N	456	1	1	1	2	1
	7	2	4	N	Y	458	1	1	4	2	1
	7	2	6	Y	N	457	4	2	1	2	2
	7	2	6	Y	Y	459	4	2	4	2	2
	7	3	6	N	N	460	8	7	2	3	3
	7	3	6	N	Y	462	8	7	6	3	3
	7	3	8-10	Y	N	461	8	3	2	3	3
	7	3	8-10	Y	Y	463	8	3	6	3	3
	7	4	8	N	N	464	7	7	7	4	4
	7	4	8	N	Y	466	7	7	7	4	4
	7	4	>= 10	Y	N	465	7	4	7	4	4
	7	4	>= 10	Y	Y	467	7	4	7	4	4
Truck	8	2	4	N	N	520	1	1	1	2	1
	8	2	4	N	Y	522	1	1	4	2	1
	8	2	6	Y	N	521	4	2	1	2	2
	8	2	6	Y	Y	523	4	2	4	2	2
	8	3	6	N	N	524	8	7	6	3	3
	8	3	6	N	Y	526	8	7	6	3	3
	8	3	8-10	Y	N	525	8	3	6	3	3
	8	3	8-10	Y	Y	527	8	3	6	3	3
	8	4	8	N	N	528	7	7	7	4	4
	8	4	8	N	Y	530	7	7	7	4	4



	Vehicle Type	Axles	Num. Tires	Dual Tires	Over 7,000 lbs.	IAG Class	NYSTA	PANYNJ	MTA B&T	MdTA	NYSBA
							(004)	(005)	(008)	(016)	(018)
	8	4	>= 10	Y	N	529	7	4	7	4	4
	8	4	>= 10	Y	Y	531	7	4	7	4	4
	8	5	10	N	N	532	7	7	8	5	5
	8	5	10	N	Y	534	7	7	8	5	5
	8	5	>= 12	Y	N	533	7	5	8	5	5
	8	5	>= 12	Y	Y	535	7	5	8	5	5
	8	6	12	N	N	536	7	7	12	6	6
	8	6	12	N	Y	538	7	7	12	6	6
	8	6	>= 14	Y	N	537	7	6	12	6	6
	8	6	>= 14	Y	Y	539	7	6	12	6	6
	8	7	14	N	N	540	7	7	13	6	6
	8	7	14	N	Y	542	7	7	13	6	6
	8	7	>= 16	Y	N	541	7	6	12	6	6
	8	7	>= 16	Y	Y	543	7	6	13	6	6
Auto Transporter (up to 65')	9	3	n/a	Y	Y	591	6	3	6	3	3
	9	4	n/a	Y	Y	595	7	4	7	4	4
	9	5	n/a	Y	Y	599	7	5	8	5	5
	9	6	n/a	Y	Y	603	7	6	12	6	6
	9	7	n/a	Y	Y	607	7	6	13	6	6
Auto Transporter (over 65')	10	4	n/a	Y	Y	659	5	4	7	4	4
	10	5	n/a	Y	Y	663	5	5	8	5	5
	10	6	n/a	Y	Y	667	5	6	12	6	6
	10	7	n/a	Y	Y	671	5	6	13	6	6
Tractor Trailer Combination (trailer <= 48')	11	3	n/a	Y	Y	719	6	3	6	3	3
	11	4	n/a	Y	Y	723	7	4	7	4	4
	11	5	n/a	Y	Y	727	5	5	8	5	5
	11	6	n/a	Y	Y	731	5	6	12	6	6



	Vehicle Type	Axles	Num. Tires	Dual Tires	Over 7,000 lbs.	IAG Class	NYSTA (004)	PANYNJ (005)	MTA B&T (008)	MdTA (016)	NYSBA (018)
	11	7	n/a	Y	Y	735	5	6	13	6	
Tractor Trailer Combination (trailer > 48')	12	3	n/a	Y	Y	783	3,3	3	6	3	3
	12	4	n/a	Y	Y	787	3,3	4	7	4	4
	12	5	n/a	Y	Y	791	3,3	5	8	5	5
	12	6	n/a	Y	Y	795	3,3	6	12	6	6
	12	7	n/a	Y	Y	799	3,3	6	13	6	6
Tandem Trailer Combination (each trailer <= 28.5')	13	5	n/a	Y	Y	855	3,3	5	8	5	5
	13	6	n/a	Y	Y	859	3,3	6	12	6	6
	13	7	n/a	Y	Y	863	3,3	6	13	6	6
	13	8	n/a	Y	Y	867	3,3	6	17	6	6
	13	9	n/a	Y	Y	871	3,3	6	18	6	6
	13	10	n/a	Y	Y	875	3,3	6	19	6	6
Tandem Trailer Combination (each trailer > 28.5')	14	5	n/a	Y	Y	919	7,7	5	8	5	5
	14	6	n/a	Y	Y	923	7,7	6	12	6	6
	14	7	n/a	Y	Y	927	7,7	6	13	6	6
	14	8	n/a	Y	Y	931	7,7	6	17	6	6
	14	9	n/a	Y	Y	935	7,7	6	18	6	6
	14	10	n/a	Y	Y	939	7,7	6	19	6	6
Tandem Trailer Combination (one trailer <= 28.5' other > 28.5')	15	5	n/a	Y	Y	983	7,3	5	8	5	5
	15	6	n/a	Y	Y	987	7,3	6	12	6	6
	15	7	n/a	Y	Y	991	7,3	6	13	6	6
	15	8	n/a	Y	Y	995	7,3	6	17	6	6
	15	9	n/a	Y	Y	999	7,3	6	18	6	6
	15	10	n/a	Y	Y	1003	7,3	6	19	6	6



	Vehicle Type	Axles	Num. Tires	Dual Tires	Over 7,000 lbs.	IAG Class	NYSTA (004)	PANYNJ (005)	MTA B&T (008)	MdTA (016)	NYSBA (018)
Tractor/ Mobile Home Combination	17	3	n/a	Y	Y	1103	8	3	8	3	3
	17	4	n/a	Y	Y	1107	6	4	7	4	4
	17	5	n/a	Y	Y	1111	7	5	8	5	5
	17	6	n/a	Y	Y	1115	7	6	12	6	6
	17	7	n/a	Y	Y	1119	7	6	13	6	6
	17	8	n/a	Y	Y	1123	7	6	17	6	6
	17	9	n/a	Y	Y	1127	7	6	18	6	6
	17	10	n/a	Y	Y	1131	7	6	19	6	6



C.8 VECTOR Internal and External Interface Files

Interface Files listed below are shown in the approximate order in which they occur during normal transaction processing, with internal files listed first, then external reciprocity files

C.8.1 Internal Interface Files

Various internal interface files are used by VECTOR subsystems as described below:

INTERNAL Interface Files		
File Extension	Interface File Name	Description
CTOL	Casual Toll	Inter-Agency casual use transactions to record Home Agency customer transactions on Away Agency lanes.
ETOL	Electronic Toll	Normal Home Agency ETC Transaction by Home or Away Customers from either an ETC-dedicated or mixed-mode lane.
MTOL	Manual Toll	Home Agency Manual Toll (cash or token transaction in a manual or mixed-mode lane or processed from a Manual Toll Log).
LTX	Lane Transaction	Manual tolls recorded in the lane sent via an LTX file through the MTOL Batch Program.
FTOL	Facility Operator (FO) Toll	Non-toll transactions by a Home or Away Customer on a Non-Toll Facility associated with the Home Agency. Also used for incoming Non-Toll transactions by Home Customers on Away Agency non-toll facilities once Reciprocity II (non-toll reciprocity) implemented.
VIOL	Violation Transactions	Violation transactions identified by a Home Agency lane. Includes Toll Evasions and Class Mismatch transactions.
REJC	Rejected Transactions	Transactions rejected during processing that either fail validation or have uncorrectable errors in customer, account or device information.
UNMA	Unmatched Transactions	Used on Closed-Loop systems only. Contains entry and exit transactions to be matched to form a complete transaction.
UTOL	Unmatched Handler Toll	Used on Closed-Loop systems only. Contains matched entry and exit transactions from the UNMA file exit transactions corrected by Agency business rules (typically the max toll) to compensate for the lack of an entry transaction.
DISC	Discarded Toll	Transactions unable to be matched by the Unmatched Handler that are saved for later reconciliation against the source UNMA file.
ITOL	Image Toll	A Violation Transaction that has undergone image review and is now ready for posting to a customer account.
VTOL	Violations Toll	Violations that are identified as Postable to Accounts, including Class Mismatch transactions.
VCTX	Violation Transaction File for Away Customers	Internal interface between VEMS and TPMS in which VEMS passes those violation transactions that are postable to Away Agency customers in an ICTX file. VEMS uses the data contained in the ICLP file to determine Away Customer plate information to permit posting of violation transactions to Away Customers without DMV lookup.

File Extension	Interface File Name	Description
ECTX	Electronic Transaction File for Away Customers	Internal interface file within TPMS for recording transactions from the Unmatched Handler that are postable to Away Customer accounts by inclusion in an outgoing ICTX file.
UCTX	Unmatched Handler File for Away Customers	Internal interface file within TPMS for recording transactions from the Unmatched Handler that are postable to Away Customer accounts by inclusion in an outgoing ICTX file.
ENTX	Electronic Non-Toll Transactions for Away Customers	Same as the ECTX file, but for handling non-toll transactions by Away Customers on Non-Toll Facilities associated with the Home (Non-Toll Host) Agency.
UNTX	Unmatched Handler Non-Toll Transactions for Away Customers	Same as UCTX file, but for handling non-toll transactions by Away Customers on Non-Toll Facilities associated with the Home (Non-Toll Host) Agency.



C.8.2 External Interface Files

Various interface files are used by VECTOR to correspond with external agencies as shown below:

EXTERNAL Interface Files		
File Extension	Interface File Name	Description
Miscellaneous Interface Files		
ACK	Acknowledgement File	The Acknowledgment File shall be created, by the entity receiving a file reciprocity interface file, to inform the entity which sent the original file that the file transmitted was received in its entirety. An Acknowledgement File shall be sent for each of the external reciprocity interface files.
ICLP	Customer License Plate File	Created by the Home Agency/CSC to inform Away Agencies/CSCs of the vehicle license plate numbers of its customers. This file will allow the Away Agency/CSC to collect the toll from the Home Agency/CSC for an untagged or unread device Home Customer violation on the Away Agency lanes. Currently, violation processing is limited to Home Customers only. The exchange of this information will allow this to be done between Agencies/CSCs so that Away Customer's whose tags are not read will not be treated as violators, but can have the appropriate toll deducted from their accounts (since they will have been identified).
Tag (Device) Related Toll Files		
ITAG	Tag (Device) Status File	Created by the Home Agency/CSC to inform Away Agencies/CSC's as to the status of each tag (device) associated with an account held by the Home Agency/CSC. This file also informs the Away Agencies/CSC's as to the discount plans associated with each device.
ITGU	Tag (Device) Status Update File	Created by the Home Agency/CSC to inform Away Agencies/CSC's as to the updated status of particular new and/or existing tags (devices) associated with customer accounts held by the Home Agency/CSC. Used to report updated information more frequently than the ITAG file. Allows those Agencies and/or CSC's with the capability to update their lane systems throughout the day between transmittals of the ITAG file.
ICTX	Transaction File	Created by the Away Agency/CSC's to inform the Home Agency/CSC of all toll transactions occurring at Away Agency/CSC facilities for valid tags and license plates belonging to the Home Agency/CSC. Also used by the Home Agency to send Away Customer transactions on Home Agency lanes to the Away Agency holding the customer account.
ICRX	Transaction Reconciliation File	Created by the Home Agency/CSC to inform Away Agencies/CSC's as to the disposition of toll transactions processed by the Home Agency or CSC which occurred at the Away Agency's/CSC's facilities. Performing detailed transaction level reconciliation allows the Away Agency/CSC to ensure that all transactions were properly received and processed and to track toll and non-toll usage accordingly. Also sent by Away Agencies to reconcile the ICTX files sent to them by the Home Agency.
ITXC	Transaction Correction File	Created by Away Agencies/CSC's to replace toll transaction information already sent to the Home Agency/CSC with updated/corrected information. Also used by the Home Agency to correct information in a transaction file previously sent to an Away Agency.

File Extension	Interface File Name	Description
IRXC	Correction Reconciliation File	Sent by the Agency receiving an ITXC file to the ITXC originating Agency to allow that Agency to reconcile transactions posted from an ITXC file. Used by both the Home and Away Agencies.
Non-Toll Related Files		
FTAG	Facility Operator (FO) Tag (Device) Status File	The FO Tag (Device) Status File is created each day by the Host CSC for each Non-Toll Facility Operator serviced by the Host. The Tag (Device) Status File will contain only valid tags per Reciprocity IIIAG Reciprocity II (Non-Toll Reciprocity).
FNTX	FO Transaction File	The FO Transaction file is created once each day by each non-toll Facility Operator and sent to their Host CSC. This file contains all non-toll transactions previously accepted by the Facility Operator but not yet processed by the Host Agency. Transaction Files contain original transactions only (not corrections or re-submittals).
INTX	Non-Toll Transaction File	Created by the Host Agency/CSC to inform the Home Agency/CSC of all non-toll transactions occurring at Host Agency/CSC facilities for valid devices belonging to the Home Agency/CSC.
INRX	Non-Toll Reconciliation File	Created by the Home Agency/CSC to inform the Away Non-Toll Host Agency/CSC as to the disposition of non-toll transactions processed by the Home Agency/CSC which occurred at the Away Non-Toll Host Agency's/CSC's facilities. A given INRX file is link to only one INTX file. Performing detailed transaction level reconciliation allows the Host Agency/CSC to ensure that all transactions were properly received and processed and to track toll and non-toll usage accordingly.
FNDX	FO Distribution File	For every FO Transaction File (FNTX) received, the Host Agency/CSC shall send an FO Distribution File back to the originating Facility Operator summarizing the transactions in the FO Transaction File and the Agencies to which posting was directed (via an INTX file). The file header contains the file number from the corresponding FO Transaction File. There are <i>n</i> records, one record for each Agency/CSC represented in the FO Transaction File. The Distribution File provides the Facility Operator with assurance that the transactions in the corresponding Transaction File have been bundled by their Host Agency into the appropriate INTX files and sent to the appropriate Agencies/CSC's (including the Host for posting).
FNRX	FO Transaction Reconciliation File	The Host CSC for a Non-Toll Facility will generate <i>n</i> FO Transaction Reconciliation Files for each FO Transaction File received from other Agencies: One file for each Agency/CSC represented in the FO Transaction File (including the Host). These files correspond one-to-one with INRX reconciliation files received from each Agency/CSC in response to an INTX file. The file header contains the corresponding INTX file number and there is one detailed record for each transaction reconciled. Per IAG rules, an INRX file will not be generated until all transactions in the corresponding INTX file have been fully processed. The FO Distribution File (FNDX) provides the link to original FNTX.

File Extension	Interface File Name	Description
FTXN	FO Correction File	<p>The Facility Operator uses the FO Correction File to resubmit rejected, declined or incorrect transactions*. Original transactions may be resubmitted only once and only if the most recent FTAG Device Status file indicates that the corresponding device is valid. The transactions included in a correction file may be from any Home Agency and from any time (within the processing time limits). FO Correction Files may not be sent more frequently than once per week.</p> <p>* Note: While the FO Correction File is used to make adjustments initiated by the Facility Operator, there is no corresponding file to make adjustments initiated by the Host Agency/CSC (i.e. reversals and disputes). These adjustments are made at the Host CSC and the information is related to the Facility Operator via the Host Reports.</p>
FRXN	FO Correction Reconciliation File	The Host CSC shall generate one FO Correction Reconciliation File for each FO Correction file. Note that unlike FO Transaction Files, FO Correction Files are not split by the Host Agency into smaller files. Therefore, only one FO Correction Reconciliation File is required for each FO Correction File.
ITXN	Non-Toll Transaction Correction File	Sent by a Facility Operator to their Host Agency/CSC to replace non-toll transaction information previously sent to the Home Agency/CSC via an FO Correction File (FTXN) with updated/corrected information.
IRXN	Non-Toll Correction Reconciliation File	Created by the Home Agency/CSC to inform the Host Agency/CSC as to the disposition of non-toll correction transactions processed by the Home Agency/CSC which occurred at the Host Agency's/CSC's non-toll facilities. Performing detailed transaction level reconciliation allows the Host Agency/CSC to ensure that all transactions were properly received and processed and to track toll and non-toll usage accordingly.