

**BATA - TCA**  
**Customer Service Center to**  
**Revenue Control System Interface**

**Interface File**  
**Specifications**

Revision 1.7  
October 16, 2006

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## List of Revisions

Rev. 1.0A Initial Release

Rev. 1.1

Rev. 1.2

Rev. 1.3

Rev. 1.4 (May 3, 2006)

Document Title Change

Adjusted Business Rule #3

Adjusted Title 21 32-bit Transponder Field Definitions to match the latest available from CALTRANS (dated August 9, 2005)

Corrected file extension in General File Format Rule #15

## **Document Control**

All suggested additions, changes, and deletions should be submitted to:

ACS Government Solutions  
Transportation Technology Center  
12410, Milestone Center Dr,  
Suite 400  
Germantown, MD 20876

Archival of this document will be with ACS at the location specified above.

## Goal

To provide interoperability between non-toll systems, e.g. off-street parking and the RFID based electronic toll collection (ETC) systems with the intent to allow the ETC RFID transponders/tag to be used at non-toll facilities with the charges for the non-toll use being collected from the tag holders Account setup for ETC.

Non-toll fee transactions will be processed against the ETC Account and/or its funding source (e.g. credit card) and funds will be collected and transferred to the non-toll operator based on business rules agreed upon. No violation processing or enforcement of non-payment or non-identification of the user of the non-toll facility will be handled by the ETC systems and hence not part of this specification.

Acquiring Agency	The owner/operator of the facilities at which a transaction occurred.
AVI	Automatic Vehicle Identification
CHP	California Highway Patrol – State law enforcement agency charged with enforcing the California Vehicle Code.
Facility Code	A number within a range of numbers assigned by CALTRANS to the Issuing Agency, which is programmed into the transponder for automatic identification purposes
Host Agency	The ETC Agency that hosts a non-toll Facility operator and handles all of the interactions with the Facility operator.
Issuing Agency	The entity that establishes the account and issues the transponders.
Lane Controller	Device which records data read from a transponder by overhead antennas, reads light curtains to provide for vehicle separation, treadles to determine axle count, and can control gates or barriers if the proper toll is paid via AVI or deposit of coins.
Reciprocating Agency	Any agency with which the Issuing Agency has a User Fee Processing Agreement.
Tag ID	A number ranging from 0 to 1023 associated with a single facility code that further uniquely identifies a transponder. For example, a facility code of 132196 would have 1024 tag ids associated with it
Tag Type	A number within a range that identifies the type of transponder
Transponder (tag)	Device to allow for automatic transaction identification, works by means of radio signal activation and returns the information programmed into by the Issuing Agency.

## **Business Rules**

- 1) Identification of Issuing Agency - The Facility Code on the tag will identify the Issuing Agency (holder of the account). This requirement ensures that tags cannot be transferred from one agency to another.
- 2) Validity of transponders/tags for use at non-toll facilities – All individual (private) ETC accounts that are backed by a credit card or other forms of automatic funding will be valid for use of non-toll facilities. This is subject to maintaining the ETC account in good standing based on other terms and conditions that will be stipulated by the ETC account owning Agency. These individual accounts can choose to opt-out of the use of non-toll facilities at any time.

Business or Commercial accounts could also use this facility subject to the same business rules. These accounts could be initially defaulted to be either eligible or not (based on agreed upon business rules) for use of non-toll facilities.

Private and Business accounts can at any time change their ability to use non-toll facilities by opting in or opting out of the use of non-toll functionality by using the Account Management System that manages their ETC account.

- 3) Collection of non-toll fee on valid tags - The Issuing Agency will honor all non-toll transactions on transponders that were deemed “valid” in the Tag Status File, as sent to the Acquiring Agency for the date associated with each non-toll event and that can be collected from an ETC Account. The Acquiring Agency has the responsibility to ensure the validity of the transponder before assessing the fee and generating the transaction.

The non-toll fee will be collected from the pre-paid funds associated with the ETC Account if the non-toll fee is less than \$x.xx (e.g. \$20.00). If the fee is greater than or equal to \$x.xx (e.g. \$20.00), then a single attempt will be made to collect the same from the automatic funding source associated with the account (at the discretion of the processing agency). If the attempt to collect is rejected or denied, the transaction will be rejected and returned back to the non-toll acquiring operator. In addition in this case, the account will be marked invalid for all future use of the non-toll facility (to protect the non-toll facility operator from future use) until the account has been made good again.

- 4) Non-toll fee transactions are to be processed according to the status of the transponder at the time the fee is being assessed, e.g. exit of a parking facility.
- 5) All non-toll charges based on valid transponders need to be uploaded to the Host Agency system in the TOL file by 02:00 AM each day. All transactions should be submitted before 30 days from transaction date.

- 6) By convention all agencies accept that the reconciled toll charges will be available by 12:00 noon the following business day after processing with all reconciliation completed no longer than 14 calendar days after receipt.
- 7) The suggested time for the completion of the upload of all tag status files needed by an entity is set at 01:00 a.m. If a tag status file has not been received from an Issuing Agency, then the Receiving Agency should use the file(s) received the immediate preceding day. If a file (or files) is received past the recommended deadline, the receiving agency should make a best-effort to use the file(s) received.
- 8) Corrections and resubmissions should be submitted back to the Host Agency within 60 days of original transaction. Any corrections received after that will be rejected.
- 9) Resubmissions for declined transactions should be based on the transponder status in the Tag status file becoming valid again. The non-toll facility operator systems will check the transponder status in the Tag file delivered each day and resubmit declined transactions based on a tag becoming valid again.

## **Technical Specifications**

### **File Exchange Methodology**

Currently the file transfer mechanism utilizes the ftp (file transfer) protocol over the Internet to exchange the data files to/from each agency's ftp server. The transfer files are created with an agency's proprietary software, but the files conform to the formats described in this document. The files are generated in an ASCII format, and then the sending agency encrypts the file using PGP (pretty good privacy) encryption tools, and the receiving agency's public key. This also has the effect of compressing the data. The sending agency then utilizes the ftp protocol to send the encrypted files to the receiving agency's ftp server. The receiving agency possesses its private key and can therefore decrypt the received files. After decryption, the receiving agency processes the data with their own proprietary software.

### Requirements

- Each agency must have a publicly accessible ftp server, with or without a DNS entry on the Internet. An ftp exchange can be accomplished with only the IP address.
- The receiving agency will provide a special account and password to each agency that will transmit files to it. This is to prevent anonymous users from accessing the ftp site.
- Each agency shall install a PGP encryption package suitable for the platform they run on.
- Files will be encrypted before transmission to ensure the confidential data does not fall into unauthorized hands.

## File Naming Conventions

The file names (and extensions) are designed to be able to tell, at a glance, the information contained in the file, its source and its destination. All file names and extensions shall use lowercase characters.

The file extensions shall define the type of information contained in the file and shall be as shown in Table 1.

Table 1 - File Extensions

File Description	File Extension	Originate/Response
Tag Status File	tag	Originate
Non-Toll Charges (Transaction) File	tol	Originate
Reconciled Toll Charges File	trc	Response
Non-Toll Charges Correction File	txl	Originate
Non-Toll Charges Correction Reconciliation File	txc	Response

File names shall use two distinct formats depending on whether the file is an Originate file or a Response file.

Originate file names shall have the format:

aabb\_yyyymmdd\_hhmmss.xxxx

Where the fields are defined as follows:

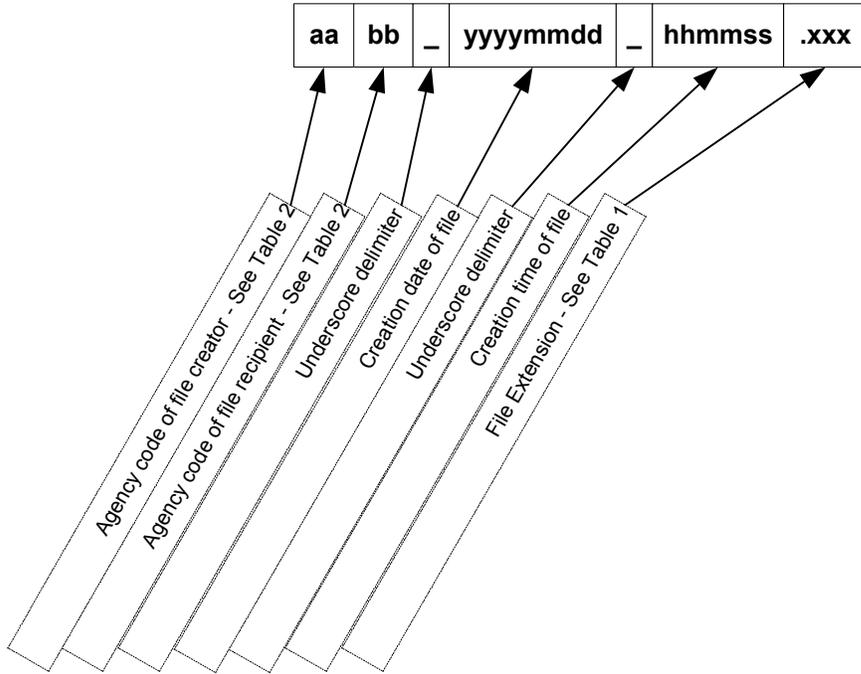


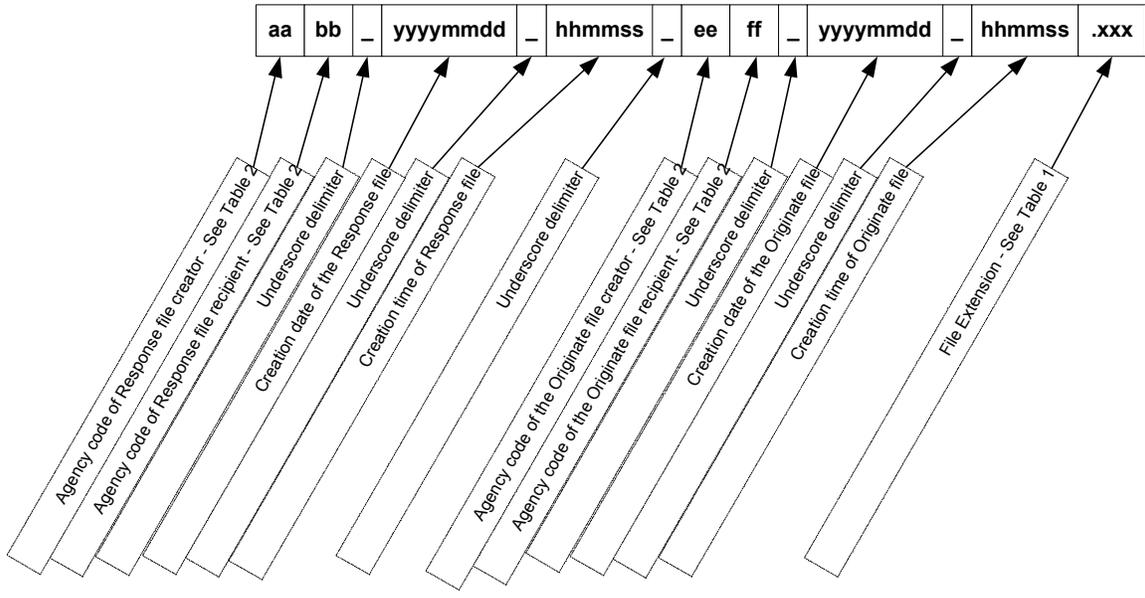
Table 2 - Agency Codes

Agency Name	Agency Code
CALTRANS (ATCAS)	at
Golden Gate Bridge	gg
Transportation Corridor Agencies (TCA)	tc
SFO Parking	sf

Response file names shall have the format:

aabb\_yyyymmdd\_hhmmss\_eeff\_yyyymmdd\_hhmmss.xxxx

Where the fields are defined as follows:



The format of the Response file name is such that one can tell, at a glance, not only the creator of the Response file, but also the Originate file to which this file is a response.

## California's Definition for Title 21's 32-Bit Transponder ID Number Field

In the State of California, the 32-bit Transponder ID Number Field specified in the Title 21 standard has been further subdivided into three data fields to represent Tag Type, Facility Code, and Internal Tag ID. These fields are currently defined as follows:

<b>32-Bit Transponder ID Number Field</b>		
<i>Tag Type</i>	<i>Facility Code</i>	<i>Internal Tag ID</i>
4 Bits	18 Bits	10 Bits
16 Possibilities	262,144 Possibilities	1,024 Possibilities
Most Significant Bit		Least Significant Bit

### Tag Type

A 4-bit field currently established to uniquely differentiate California's transponders from transponders that originate from agencies external to the state. In the future, the unassigned bits could be used to recommend a unique North American agency numbering scheme, or to further describe the behavior of the transponder. Currently, the 4-bit field is defined in decimal notation as follows:

- 0 - California
- 1 – 15 - Unassigned. Available for a future use.

### Facility Code

An 18-bit field used to identify the facility or entity conducting business. Facility Code ranges are assigned based upon the number of transponders that are projected to be utilized. Currently, this 18-bit field is defined in decimal notation as follows:

<b>Facility</b>	<b>Start</b>	<b>End</b>	<b>Number of transponders</b>	<b>32 bit tag Hex ID Range</b>
State of California	0	125000	128,001,024	00000000 - 07A123FF
Sacramento County Dept. of Airports	125001	125020	19,456	07A12400 – 07A173FF
TCA	130047	132092	2,095,104	07EFFC00 - 080FF3FF
SR-91	132096	132607	524,288	08100000 - 0817FFFF
SANDAG I-15	132992	133001	10,240	081E0000 - 081E27FF
Golden Gate Bridge	133015	133407	402,432	081E5C00 - 08247FFF
CTV	134583	134876	301,056	0836DC00 - 083B73FF
SENTRI	184876	185022	150,528	0B48B000 - 0B4AFBFF
SANDAG I-15	258960	259014	55,296	0FCE4000 - 0FCF1BFF
ATCAS	260096	261116	1,045,504	0FE00000 - 0FEFF3FF

\*NOTE:Both ATCAS and Golden Gate Bridge transponder ranges are managed and processed by BATA.

## Tag ID

A 10-bit field used to refer to the unique identification numbers that belong to an assigned Facility Code. For each Facility Code, a block of 1,024 Internal Tag IDs (running from 0 to 1,023) will be assigned within the Transponder ID Number Field. Assignment of the Internal Tag IDs is the responsibility of the Facility Code Agency.

## Title 21 Agencies Out-Of-State

Since the Title 21 standard is an open specification, there are other agencies outside of California that can also use interoperable transponders. These external agencies could inadvertently duplicate California's transponder ID number field assignments and render them non-unique.

Following is a listing of out-of-state Title 21 agencies that have contacted the California Department of Transportation to participate in California's unique definition for the 32-bit Transponder ID Number field. Please note that this listing does not insure that the assignments are unique as they may have been duplicated by another agency outside of California.

<b>32-bit Transponder ID Number Field Definition for Title 21 Agencies Out-of-State</b>				
<b>Agency</b>	<b>Tag Type</b>	<b>Facility Code Start</b>	<b>Facility Code End</b>	<b>Number of Transponders</b>
Colorado E-470 Public Highway Authority	2	0	229	235,520

Updated: Caltrans – August 9, 2005

## General File Format Rules

The following rules apply to all files used in interoperability:

1. All files will be in ASCII format.
2. All files will use the comma “,” as the field delimiter.
3. All files will use the line feed “LF” (hex 0A) as the record delimiter.
4. Each file will contain:
  - a. A header record
  - b. Detail records
  - c. A trailer record
5. All numeric fields will be fixed size and with leading zeros.
6. All date fields will be delimited with a forward slash “/”.
7. All time fields will be delimited with a colon “:”.
8. The Plaza/Lane combination will be pre-defined for validation and printing on patron statements (see Appendix A for Plaza/Lane designations – to be defined).
9. Date fields will have the following format: MM/DD/YYYY
10. Time fields will have the following format: HH:MM:SS
11. The BUSINESS DAY field will be implemented by each agency according to that agencies’ own Business Day definition.
12. By mutual consent, file transfer times can be adjusted.
13. Processing and file transfer take place 365/366 days per year.
14. a) Transaction Number and Date must be a unique combination.  
b) Tag#, Plaza, Lane, Date, and Time must be a unique combination for tolls.  
c) Also, the transaction number cannot be 0.
15. A unique sequence numbering scheme is required for each .tol, .tag and .txl file being exchanged. For example, when the non-toll facility operator is sending files to BATA, the .tol and .txl files should be numbered 1,2,3, etc. in sequence, within each file type.

## **Non-Toll Charges Processing**

### **Narrative**

Interoperability requires that certain static information be exchanged by the issuing and non-toll agencies on a daily basis. Each non-toll operator integrates the information from the Host Agency's *Tag Status File* into their own lane controllers at the beginning of each day, prior to any significant traffic flow on their own facility. This allows the lane controllers to differentiate between Valid and Invalid transponders. Each agency can then take such action, based on their own requirements, to handle invalid transponders.

Upon receipt of a non-toll charges transaction file, it will be processed by the host agency according to pre-defined business rules. After the transaction file is processed by the Host Agency, the Host Agency will create a *Reconciled Non-Toll Charges File* and send it to the Acquiring Agency. This file will contain a detail record for every transaction received by the Host Agency from the Acquiring Agency in the corresponding Non-Toll Charges file.

## Non-Toll Charges File

### Non-Toll Charges Header Record Format

Field #	Field Name	Field Type	Length	Notes
1	RECORD TYPE	#HEADER	7	Indicates this is a header record (#HEADER)
2	FILE TYPE	TOLL	4	Indicates this is a non-toll charges file (TOLL)
3	SEQUENCE #	Integer	6	Sequence # generated by sending agency, has matching entry in the trailer record
4	BUSINESS DAY	Date	10	Business day
5	SOURCE	Alpha	2	Two letter code of source entity
6	DESTINATION	Alpha	2	Two letter code of destination entity
7	CREATE DATE	Date	10	Transmission file create day
8	CREATE TIME	Time	8	Transmission file create time in 24 hr clock

### Non-Toll Charges Detail Record Format

Field #	Field Name	Field Type	Length	Notes
1	TAG ID	Hex	8	Tag ID in hex format. Must be consistent with Destination field (e.g. if Destination is AT then file can only contain transactions for tags in AT transponder Hex-ID range.)
2	TRAN #	Integer	10	Transaction # generated by sending agency
3	TRAN DATE	Date	10	Transaction date
4	TRAN TIME	Time	8	Transaction time in 24 hour format
5	TRAN AMOUNT	Money	8	Amount charged for transaction
6	PLAZA	Integer	4	Location/Plaza Site
7	LANE	Integer	2	Lane identifier

### Non-Toll Charges Trailer Record Format

Field #	Field Name	Field Type	Length	Notes
1	RECORD TYPE	#TRAILER	8	Trailer record indicator
2	SEQUENCE #	Integer	6	Sequence # matching entry in header
3	BUSINESS DATE	Date	10	Business day
4	RECORD COUNT	Integer	6	Number of detail records
5	TRAN SUM	Money	10	Total amount of all transactions in file

### Non-Toll Charges Sample File

```
#HEADER, TOLL, 000123, 06/23/1997, SF, AT, 06/24/1997, 02:02:19  
081000FA, 0000403986, 06/23/1997, 20:14:50, 00000.25, 2216, 02  
0810012C, 0004279389, 06/22/1997, 11:09:20, 00001.00, 1163, 03  
0810012C, 0004310215, 06/23/1997, 06:40:09, 00001.00, 1162, 03  
#TRAILER, 000123, 06/23/1997, 000003, 0000002.25
```

### Reconciled Non-Toll Charges File

This file contains detailed status for each transaction received in the non-toll charges transaction file. This status reflects the ability to collect the fee from the ETC account that the transponder was associated with. The status that is associated with the transaction should be used to determine if the revenue due was successfully collected or failed and if other actions need to be initiated by the non-toll facility operator to collect the fee from the user.

#### Reconciled Non-Toll Charges Header Record Format

Field #	Field Name	Field Type	Length	Notes
1	RECORD TYPE	#HEADER	7	Indicates this is a header record (#HEADER)
2	FILE TYPE	RECONCILE	9	Indicates this is a reconciled non-toll charges file (RECONCILE)
3	SEQUENCE #	Integer	6	Sequence # from the originating toll charges file, duplicated in trailer record
4	BUSINESS DATE	Date	10	Business day
5	SOURCE	Alpha	2	Two letter code of source entity
6	DESTINATION	Alpha	2	Two letter code of destination entity
7	CREATE DATE	Date	10	Transmission file create day
8	CREATE TIME	Time	8	Transmission file create time in 24 hr clock

#### Reconciled Non-Toll Charges Detail Record Format

Field #	Field Name	Field Type	Length	Notes
1	TAG ID	Hex	8	Tag ID in hex format
2	TRAN #	Integer	10	Transaction # generated by sending agency
3	TRAN DATE	Date	10	Transaction date
4	TRAN TIME	Time	8	Transaction time in 24 hour format
5	TRAN AMOUNT	Money	8	Amount charged for transaction
6	PLAZA	Integer	4	Location/Plaza Site
7	LANE	Integer	2	Lane identifier
8	RESPONSE CODE	Alpha	1	A – Accepted O – Over 30 days old C – Direct charge declined by financial institution N – Debit to account rejected as account is no longer backed by a valid funding source D – Duplicate F – Invalid format (does not conform to format) I – Invalid (not found in tag file, etc) Note: Only A indicates Paid. All other codes are reasons for rejection.

#### Reconciled Non-Toll Charges Trailer Record Format

Field #	Field Name	Field Type	Length	Notes
1	RECORD TYPE	#TRAILER	8	Trailer record indicator (#TRAILER)
2	SEQUENCE #	Integer	6	Sequence # matching entry in header
3	BUSINESS DATE	Date	10	Business day
4	DETAIL COUNT	Integer	6	Total count of all detail records
5	DETAIL AMOUNT	Money	10	Total amount of all detail records
6	ACCEPTED CNT	Integer	6	Count of accepted detail records
7	ACCEPTED SUM	Money	10	Total amount of accepted detail records

**Reconciled Non-Toll Charges Sample File**

#HEADER, RECONCILE, 000123, 06/23/1997, AT, SF, 06/24/1997, 02:02:19  
081000FA, 0000403986, 06/23/1997, 20:14:50, 00000.25, 2216, 02, I  
0810012C, 0004279389, 06/22/1997, 11:09:20, 00001.00, 1163, 03, A  
0810012C, 0004310215, 06/23/1997, 06:40:09, 00001.00, 1162, 03, A  
#TRAILER, 000123, 06/23/1997, 000003, 0000002.25, 000002, 0000002.00

## Tag Status File

This file contains the details of all transponders valid for use at a non-toll facility. It does NOT contain transponders that are invalid for use. The non-toll facility systems are expected to check for the presence of a valid transponder before allowing usage of the facility using the transponder in the vehicle.

### Tag Status Header Record Format

Field #	Field Name	Field Type	Length	Notes
1	RECORD TYPE	#HEADER	7	Indicates this is a header record (#HEADER)
2	FILE TYPE	TAGS	4	Indicates this is a tag status file (TAGS)
3	ACTION CODE	Alpha	4	Update code: INIT – means full file (only option available at this time)
4	SEQUENCE #	Integer	6	Sequence # generated by sending agency, has matching entry in the trailer record
5	BUSINESS DATE	Date	10	Business Day
6	SOURCE	Alpha	2	Two letter code of source entity
7	DESTINATION	Alpha	2	Two letter code of destination entity
8	CREATE DATE	Date	10	Transmission file create day
9	CREATE TIME	Time	8	Transmission file create time in 24 hr clock

### Tag Status Detail Record Format

Field #	Field Name	Field Type	Length	Notes
1	TAG ID	Hex	8	Tag ID in hex format
2	ACTION CODE	Alpha	1	A – Add tag as valid
3	TAG TYPE	Alpha	1	V – Valid N – Non revenue (reserved for future use) I – Invalid (reserved for future use)
4	SUBTYPE	Alpha	1	First info field: N – No information (reserved for future use)
5	SUBTYPE	Alpha	1	Second info field N – No information (reserved for future use)
6	SUBTYPE	Alpha	1	Third info field N – No information (reserved for future use)

### Tag Status Trailer Record Format

Field #	Field Name	Field Type	Length	Notes
1	RECORD TYPE	#TRAILER	8	Trailer record indicator (#TRAILER)
2	SEQUENCE #	Integer	6	Sequence # matching entry in header
3	BUSINESS DATE	Date	10	Business day
4	DETAIL COUNT	Integer	8	Total count of all detail records

### Tag Status Sample File

```
#HEADER, TAGS, INIT, 000123, 06/24/1997, AT, SF, 06/23/1997, 02:02:19  
081000FA, A, V, N, N, N  
0810012C, A, V, N, N, N  
0810012C, A, V, N, N, N  
#TRAILER, 000123, 06/23/1997, 00000003
```

Non-Toll Charges Correction File

Correction file not used. RCSC reprocesses rejected credit card transactions for SFO.

## APPENDIX A: Plaza/Lane Descriptions

Plaza	Lane	Statement Description (22 character limit)
5001	01	SFO Garage 1 Lane 1
5001	02	SFO Garage 1 Lane 2
5002	01	SFO Garage 2 Lane 1
5002	03	SFO Garage 2 Lane 2

*These codes here are sample only and need to be finalized in conjunction with SFO and BATA.*