National Interoperability
Interface Control Document
Version 1.02
# FINAL

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# Modification History

| Date | Version | Modifications |
|------|---------|---------------|
| September/ October 2018 | NIOP X.XX | 1. Conformed the Southern States Interoperability ICD to National Interoperability ICD.<br>2. Incorporated revisions requested by the NIOP Working group.<br>   a. Entry and Exit Date/Time with the Time zone to be added in the spare fields in transaction data. [Edited and created separate fields in November 2018.]<br>   b. Add GS and US as License Plate State Codes. [Removed US in November 2018.]<br>   c. Update Tag Agency ID Appendix.<br>   d. Updated Tag ID to 10 characters.<br>   e. Use of the word "Local" (Local Hub/Local Agency). Add to Definitions, if needed.<br>   f. Updated Classification Fields to be 4 characters and optional.<br>   g. Updated Tag Class Fields to be 4 characters and not optional.<br>   h. Edited XML Definitions.<br>   i. Conform document to NIOP:<br>     i. Edited Southern States ICD to conform to NIOP.<br>     ii. Replaced Southern States specific drawing with NIOP map.<br>     iii. Removed abbreviations and terms that are no longer used.<br>     iv. Added Table from M. Kolb & added ATA column.<br>     v. Cross-referenced Agencies with Hubs.<br>   j. Changed the reference to IBR-REC 6 to IBR-REC-7.<br>3. Moved appendices to separate documents. |
| November 2018 | NIOP 1.00 | Edited based on NIOP Technical Meeting November 7-8, 2018.<br>Added XML Definitions and samples from ETCC.<br>Removed remaining SSIOPs and references.<br>11/26/18: As suggested by M. Kolb:<br>1. Removed "CSC" where appropriate.<br>2. Section 1, Introduction: The table column labeled "File Extension" may be better titled "File Extension / Submission Type"<br>3. Removed or replaced "file" with "submission" where appropriate. |
| February 2019 | NIOP 1.01 | Added Appendix E License Plate Types.<br>Corrected appendix naming convention. |
| March 2019 | NIOP 1.02 | Added revised XML examples. |
| May 2019 | NIOP 1.02 FINAL | Removed DRAFT, updated date and made FINAL. |

# 1    Introduction

The purpose of this document is to describe and record the interfaces for National interoperability.

This document, the *National Interoperability Interface Control Document,* defines the formats for all data that is transmitted between the NIOP Hubs who participate in National Interoperability (NIOP).

The interface data types defined are:

| Data Type | File Extension / Submission Type | Usage |
|---|---|---|
| Tag Validation List | {Bulk Identifier}TVL | Tag Validation List (TVL) data shall be created by each Home Agency to inform the Away Hubs and Agencies as to the status of tags and license plates associated with an account held by the Home Agency. |
| Transaction Data | STRAN | Created by the Away Hub (based on transactions from the Away Agencies) to inform the Home Hub of all toll transactions occurring at Away Agency facilities for tags and/or license plates belonging to a Home Agency as determined by its inclusion in the TVL active at the time of the transaction.<br><br>Away Hub determines Home Agency ID if not already specified by the Away Agency.  One STRAN data submission is created per Away/Home Agency pair. |
| Adjustment/Correction Data | SCORR | Created by the Away Hub (based on correction data from the Away Agencies) to replace toll transaction information already sent to the Home Hub with updated/corrected information. Such adjustment/correction data will be provided to the Home Agency to which the original transaction information was originally delivered.  Note: replacement data represents current values, not delta from previously submitted values. Adjustments and resubmittals may be included in the same SCORR submission.  Adjustment/Correction Data also includes resubmitted transactions. |
| Reconciliation Data | SRECON | Created by the Home Hub (based on reconciliation data from the Home Agencies) to inform the Away Hub as to the disposition of toll transactions processed by the Home Agency belonging to the original Transaction Data submission. Performing detailed transaction level reconciliation allows the Away Agency and the Away Hub to ensure that all transactions included in the original Transaction Data submission were properly received and processed. |
| Acknowledgement Data | ACK | Created by the Hub which received a submission to inform the Hub which sent the submission that the submission was received in its entirety. Acknowledgement data shall be sent for each of the above referenced submissions. |

## 2 General Data Requirements

1.  All participating Hubs shall support the exchange of data as XML files utilizing SFTP for Tag Validation List data and their corresponding Acknowledgements. Participating Hubs shall support the exchange of individual data records or blocks of records as XML utilizing secure Web Services for Transaction data, Correction data, Reconciliation data and their associated Acknowledgements. Support of Web Services shall include support of faults, as well as timeouts as defined in the exception handling section below.

2.  When using XML file data exchange over SFTP, all files (except for the Acknowledgement data) shall be compressed (ZIPed) using .ZIP compression.

3.  When using XML file data exchange over SFTP, upon compression, file names shall be converted from {FILE_NAME}.{FILE_TYPE} to {FILE_NAME}_{FILE_TYPE}.ZIP and all files names shall be created using uppercase characters only.

4.  Data records shall be formatted utilizing Extensible Markup Language (XML).

5.  This document adopts the terms Home and Away as defined by the Business Rules for NIOP. The Home Agency is the entity that establishes and/or maintains the customer's account and issues the tag(s). The Away Agency is any agency that is not the customer's Home Agency. The Away Agency is typically the agency on whose facility the transaction transpired. An Away Agency may transmit data to a Home Agency through an Away Hub and Home Hub.

6.  The date/time values contained in a file name represents the creation date/time of the file and shall always match the date/time value contained in the file's header record.

7.  All date/time values within the data contents of a submission shall be transmitted as Coordinated Universal Time (UTC) unless otherwise indicated.

8.  A field "Type" of "Date/Time" shall be transmitted with no time zone data and shall assume a time zone of "+00:00". Date/Time format shall be "YYYY-MM-DDThh:mm:ssZ". Where,
    YYYY = 4-digit year
    MM = 2-digit month (zero filled)
    DD = 2-digit day of the month (zero filled)
    T = The 'T' character signifies the start of the time value
    hh = 2-digit hour (00-23)
    mm = 2-digit minute
    ss = 2-digit second
    Z = The "Z" character indicating UTC designation.
    Fields utilizing this format are, generally, not customer facing.

9.  A field containing "Date/Time w/TZ" shall be transmitted with time zone data. "Date/Time w/TZ" shall be "YYYY-MM-DDThh:mm:ss±HH:MM". Field utilizing this format are, generally, customer facing and allow the recipient to display date/time information with the appropriate date/time for the time zone.

10. A field "Type" of "Char" can contain any combination of alphanumeric and/or special characters as further defined in the sections below. These fields shall be left-justified with no leading characters or trailing blanks.

11. A field "Type" of "Num" shall contain only numeric characters (0 through 9). These fields shall be left-justified with no leading zeroes.

12. As Agencies strive to accept Transaction entry and exit locations without any manual intervention or configuration, it is recommended each Agency notify their Local Hub of entry and exit location additions and changes so that transactions are not rejected due to a location not being known. Hubs will notify the Other Hubs who will then, in turn, notify their Local Agencies.

13. Where XML Tags in the XML Definitions are different from the Field Name in the Data Records/Fields, the XML Tag shall take precedence.

## 2.1 Web Services Guidelines

### 2.1.1 General Web Services Guidelines

1. Simple Object Access Protocol (SOAP) Web Services shall be used.

2. Web Services send and receive example:
   a. If Central US IOP (CUSIOP) Hub needs to send data to Southeast US IOP (SEIOP) Hub, CUSIOP Hub shall use the Web Services provided by SEIOP Hub.
   b. If SEIOP Hub needs to send data to CUSIOP Hub, SEIOP Hub shall use the Web Services provided by CUSIOP Hub.

3. There are no limits on the number of transactions sent via Web Services.

### 2.1.2 General Exception Handling for Web Services

When using Web Services interfaces, the exception-handling schemes are defined as part of the Web Service Definition Language (WSDL) for each web service, generally denoted as faults. Faults can generally be categorized into two types: those that are recoverable and those that are unrecoverable.

Recoverable Faults are transient or temporary in nature. Such faults are raised by the provider to signal to the consumer that the request can be resubmitted after an elapsed time period with the expectation the transient condition has been resolved.

Unrecoverable Faults are raised when the provider is unable to process a request and resubmission without correction would result in the same fault. An example would be invalid data within the request which must be corrected in order for the request to be resubmitted and processed successfully.

The following construct defines each of these faults

```
<!-- Faults -->
<xsd:element name="RecoverableFault">
  <xsd:complexType>
    <xsd:sequence>
      <xsd:element name="message" nillable="true" type="xsd:string"/>
    </xsd:sequence>
  </xsd:complexType>
</xsd:element>

<xsd:element name="UnrecoverableFault">
  <xsd:complexType>
```

```
            <xsd:sequence>
              <xsd:element name="message" nillable="true" type="xsd:string"/>
            </xsd:sequence>
          </xsd:complexType>
        </xsd:element>
      </xsd:schema>
    </wsdl:types>l
```

In addition to the above two fault types, any web service request may result in a timeout condition.  A timeout condition occurs when no response is received from the provider within some configurable timeout interval.  When a timeout occurs, the consumer typically does not know if the provider actually received the request.  The consumer may resubmit the request with the expectation that if the prior submission was received and successfully processed, the provider will return the same response that would have been sent had the timeout condition not occurred.  Such re-submissions would not result in the request being reprocessed resulting in possible duplication.


## 2.2    SFTP File Transfer Guidelines

When transferring files between Hubs via SFTP, the guidelines in this section should be followed.

Inbound Files to a Hub from another Hub ("Other Hub"):

1.  Each Other Hub ("Other Hub") connects to the Hub's SFTP server with their credentials.

2.  Each Other Hub shall push STVL (when sending a TVL) and STVL ACK (when responding to a TVL) files to the Hub.

3.  Each Other Hub shall have their own "Inbound" directories on the Hub's SFTP server for STVL and STVL ACK submissions.  Note:  Directories are not needed for the other submission types (STRAN, STRAN ACK, SRECON, SRECON ACK, SCORR, and SCORR ACK) since they shall be transferred via Web Services.

    For example, on the CUSIOP Hub SFTP server:
    /SEIOPHUB/{env}/inbound/STVL/
    /SEIOPHUB/{env}/inbound/STVL_ACK/

    Where {env} = PROD or PREPROD

4.  Each Other Hub shall copy (SFTP) files from their local directories to the appropriate Hub's SFTP server Inbound "/temp" directory.

    For example, on the CUSIOP Hub SFTP server:
    /SEIOPHUB/{env}/inbound/STVL/temp
    /SEIOPHUB/{env}/inbound/STVL_ACK/temp

5.  Each Other Hub shall make sure that their SFTP file transfer is successful.
    a.  Compare the Local file size and the Remote file size
    b.  If both are equal, it is a successful transfer

6.  If the file transfer is successful, the Other Hub shall "move" the file from the "/temp" directory to the "/current" directory.

    For example, on the CUSIOP Hub SFTP server:
        Move from:

/SEIOPHUB/{env}/inbound/STVL/temp

<u>To:</u>
/SEIOPHUB/{env}/inbound/STVL/current

7.  If the file transfer fails, the Other Hub shall delete the file from the "/temp" directory.
<u>Outbound Files from a Hub to another Hub ("Other Hub"):</u>

1.  Since the Hubs push STVL and STVL ACK files to each other and are "inbound" to the receiving Hub, the Hub-to-Hub file transfers are treated as Inbound. There shall be no Outbound Hub-to-Hub file transfers.

# 3    Tag Validation List (TVL) Data

## 3.1    Usage

Tag Validation List (TVL) data shall be created by each Home Agency to inform the Away Hubs and Agencies as to the status of tags and license plates associated with an account held by the Home Agency. The Home Hub will combine TVLs from each Home Agency before sending the TVL to the Other Hub(s). The Away Hub forwards the TVL information to each Away Agency in the format agreed upon between the entities.

Because the transfer of TVL data is expected to involve significant volume of data at once, the transfer of TVL data will not be supported through Web Services.

## 3.2    File Name

{NIOP_Hub_ID}_{HOME_AGENCY_ID}_YYYYMMDDHHMMSS.{Bulk Indicator}TVL

Example:          9002_9002_20171201001015.BTVL

## 3.3    Data Records/Fields

| Tag Validation List Header Record | | | | |
|---|---|---|---|---|
| **Field** | **Type** | **Max Length** | **Required/ Optional** | **Description** |
| Submission Type | Char | 4 | Required | Defines the type of data in the file.<br><br>Value: STVL |
| Submission Date/Time | Date/Time | 20 | Required | The date/time (UTC) the file was created. Shall match the date/time in the file name. |
| NIOP Hub ID | Char | 4 | Required | The ID assigned to the Home Hub when transmitting the Tag Validation Data from the Home Hub to the Away Hub.<br><br>Refer to Appendix A for valid values. |
| Home Agency ID | Char | 4 | Required | The ID assigned to the Home Agency. This is the agency that manages the customer account to which toll charges may be posted.<br><br>For consolidated TVLs this is the Home Hub ID.<br><br>Refer to Appendix A for valid values. |

| Tag Validation List Header Record | | | | |
|---|---|---|---|---|
| **Field** | **Type** | **Max Length** | **Required/ Optional** | **Description** |
| Bulk Indicator | Char | 1 | Required | Indicates whether this file is a bulk update (Bulk TVL) or differential update (Differential TVL). Bulk updates shall replace all previously transmitted tag/plate data for the Home Agency ID. Differential updates shall contain all changes since the last Bulk and shall be used to indicate new tag/plate data and/or updates in tag/plate status.<br><br>Values:<br>B – Bulk<br>D – Differential |
| Bulk Identifier | Num | 9 | Required | Incremental Identifier for each Bulk TVL generated. When a Differential is created, the Bulk Identifier shall be included identifying from which Bulk the Differential should be applied. |
| Record Count | Num | 10 | Required | The number of detail records contained in this file.<br><br>Values: 0 – 9999999999 |

| Tag Validation List Detail Record | | | | |
|---|---|---|---|---|
| **Field** | **Type** | **Max Length** | **Required/ Optional** | **Description** |
| Home Agency ID | Char | 4 | Required | The ID assigned to the Home Agency. This is the agency that manages the customer account to which toll charges may be posted.<br><br>Refer to Appendix B for valid values. For example, NTTA = 0041. |
| Tag Agency ID | Char | 4 | Required | An identifier used by NIOP that corresponds to one or more Region and/or Agency field values read directly from a transponder. The Region/Agency fields encoded in a transponder represent the entity that originally issued the transponder. Refer to Appendix C, NIOP Tag Agency ID column for valid values and how they map to actual data encoded on the transponder. |
| Tag Serial Number | Char | 10 | Required | Serial Number that may be read from the transponder. Leading zeroes included. 10 decimal digits 0 – 9 converted to a character field. |
| Tag Status | Char | 1 | Required | Tag Status.<br><br>Values:<br>V – Valid (applies to both Bulk and Differential TVL)<br>Z – Zero/Negative Balance (applies to both Bulk and Differential TVL)<br>I – Invalid (only used for Differential TVL).<br><br>Notes:<br>1. Omitting a tag from a Bulk TVL automatically makes the tag Invalid.<br>2. Some Home Agencies do not support the "Z" Tag Status value and will put their Zero/Negative Balance tags into the "I" Tag Status. |
| For each Discount Type, there would be an array with the following fields: | | | | |

| | | | | Tag Validation List Detail Record |
|---|---|---|---|---|
| **Field** | **Type** | **Max Length** | **Required/ Optional** | **Description** |
| Discount Plans | Char | 12 | Optional | An array of Regional or NIOP supported discount plans associated with the transponder. Would also be used to support cross agency non-revenue status.<br><br>Discount Plans are currently not supported. The definition for this data element will be provided when support for it becomes necessary and/or is defined by NIOP. |
| Discount Plan Start Date | Date/Time | 20 | Optional | Discount Plan start date (UTC). |
| Discount Plan End Date | Date/Time | 20 | Optional | Discount Plan end date (UTC). |
| Tag Type | Char | 1 | Optional | Type of transponder. If not specified, standard windshield mounted tag is assumed.<br><br>Values:<br>S – Switchable<br>L – License Plate<br>F – Feedback<br>G - Feedback and Switchable |
| Tag Class | Num | 4 | Required | The number of axles associated with the tag. Default to "2" axle when not available. Values 2-15.<br>Note:<br>Vehicle classifications may differ between Home Agencies and have different meanings based on the business rules for the Agency or Region. |
| **For each Account Transponder Number, there would exist an array of associated plates with the following fields.** | | | | |
| License Plate Country | Char | 2 | Optional | Country code associated with the license plate.<br><br>Values:<br>US – United States<br>CA – Canada<br>MX – Mexico<br>"-" – Used for plates not in the referenced documentation in "License Plate State".<br>If a License Plate Number is provided, the License Plate Country must be provided. |
| License Plate State | Char | 2 | Optional | Standard Postal Service State abbreviation (or Province abbreviation for Canada). For Mexico, this field would contain MX.<br>Values:<br><br>Publication 28, Appendix B – US State abbreviations<br>      http://pe.usps.com/text/pub28/28apb.htm<br>Publication 28, Appendix A.A32 – Canadian Province abbreviations<br>      http://pe.usps.com/text/pub28/28apa_005.htm<br>"GS" – Used for plates issued by any Federal agency.<br> "-" – Used for plates not in the referenced documentation.<br><br>If a License Plate Number is provided, the License Plate State must be provided. |
| License Plate Number | Char | 15 | Optional | Plate letters/numbers. Shall follow format required for DMV lookups including required prefixes, suffixes, or handling of special characters as dictated by the state which issued the plate. |
| License Plate Type | Char | 30 | Optional | Plate type as required for DMV lookups. If Home Agency provides License Plate Type, Away Agency must match to that License Plate Type and must include License Plate Type in any plate based transactions. |

| Tag Validation List Detail Record | | | | |
|---|---|---|---|---|
| **Field** | **Type** | **Max Length** | **Required/ Optional** | **Description** |
| License Plate Effective From | Date/Time | 20 | Optional | Date/time (UTC) license plate became associated to the current Tag. If not provided, is assumed to be effective when first seen in this record. |
| License Plate Effective To | Date/Time | 20 | Optional | Date/time (UTC) license plate stopped being associated to the current Tag. If not provided, is assumed to still be effective as of the date of this record.<br><br>When the plate is no longer associated to the current Tag, a line item shall be included in the next Differential TVL for the Tag with this field set to the date/time the plate was no longer associated. The next Bulk TVL would exclude the association of the plate to the current Tag. |
| **For each Account Transponder Number, the following additional elements of information may be provided** | | | | |
| Account Number | Char | 50 | Optional | The unique account number at the Home Agency of the associated tag and plate data. May not be provided for all agencies. |
| Fleet Indicator | Char | 1 | Optional | Flag used to denote whether or not the indicated tag is associated with a fleet account (e.g., rental car company, etc.). If indicator is not provided, account is assumed to not be a fleet account.<br><br>Values:<br>Y – Account is a fleet account<br>N – Account is not a fleet account |

## 3.4 XML Definition

TagValidationList_1
1152018.xml

## 3.5 Processing Requirements

1. Consolidated TVLs (not Agency-specific TVLs) will be sent from the Home Hub to each Away Hub.

2. The Home Hub shall only include Transponder Data for Agencies that are nationally interoperable through the specific Home Hub. In other words, if an Agency is regionally interoperable and not nationally interoperable through the Home Hub, its tags should not be included in the TVL.

3. The transmission of the file to the Away Hub shall be completed by the Home Hub over SFTP.

4. In the event that an invalid header record is encountered (e.g., character data in a numeric field, mismatch between the number of records indicated in the header record and the actual number of detail records found, etc.), the Away Hub shall reject the file and notify the Home Hub via the Acknowledgement data.

5. In the event that an invalid detail record is encountered (e.g., inappropriate TAG_STATUS, etc.), the Away Hub shall reject the detail record and notify the Home Hub via the Acknowledgement data that one (or more) detail records were rejected. The Away Agency will continue to process and use the remaining records in the TVL. The Away Hub shall make available to the Home Hub a report showing each detail record that was rejected and the reason for its rejection. This information will be communicated back to the Home Agency as appropriate.

Because the Tag and associated Plate is not forwarded to the Away Agency when rejected, the Away Agency will treat any transactions associated with the Tag or Plate as no match on TVL.

6. The Home Hub shall perform appropriate sanity checks on the Bulk TVL data file prior to its transmission to the Away Hub. The Away Hub shall perform appropriate sanity checks on the Bulk TVL data file after receiving the transmission from the Home Hub. Such sanity checks should include, but not be limited to:
   a. A configurable threshold of unusual growth in the number of tags from previous version, initially set to (recommended 3-5%)
   b. A configurable threshold of unusual change in number of tags with a particular tag status, initially set to (recommended 3-5%)
   c. Acknowledgement Data with Return Code of 03 should be used when the sanity checks fail.

7. The Home Hub shall only include information for tags and plates which are associated to accounts managed by a Home Agency certified with the Hub.

8. The frequency of Bulk TVL data file transmissions shall be as stipulated in the Business Rules.

9. The frequency of Differential TVL data file transmissions shall be as stipulated in the Business Rules.

10. There may be 1 tag with multiple associated license plates and 1 license plate associated with multiple tags.

11. When a Tag is replaced in an existing vehicle, two line items should be included in the next Differential TVL: one for the existing Tag becoming invalid (showing the plate association ended by setting the License Plate Effective To value); the second for the new Tag (showing the plate association by setting the License Plate Effective From value). The next Bulk TVL would include only the new Valid Tag with the associated plate.

12. When a tag is included in a differential all the active license plates should be included with that tag that would have been included in the bulk. If active license plates are not included in the differential with that tag, any previous supplied active license plates will be considered to be expired.

## 3.6 Sample Submission

Below example includes 3 Tags, the first having 2 Plates associated to it, the second having a single plate, and the third having no plate.

TagValidationListSa
mple_11192018.xml

# 4    Transaction Data

## 4.1    Usage

Transaction data shall be created by the Away Hub to inform the Home Hub of all toll transactions occurring at Away Agency facilities.

## 4.2    Data Records/Fields

| Transaction Data Header Record | | | | |
|---|---|---|---|---|
| **Field** | **Type** | **Max Length** | **Required/ Optional** | **Description** |
| Submission Type | Char | 5 | Required | Defines the type of data in the submission or web service request.<br><br>Value: STRAN |
| Submission Date/Time | Date/Time | 20 | Required | The date/time (UTC) the submission was created or the web service request was submitted. |
| NIOP Hub ID | Char | 4 | Required | The ID assigned to the Away Hub when transmitting Transaction Data from the Away Hub to the Home Hub.<br><br>Refer to Appendix A for valid values. |
| Away Agency ID | Char | 4 | Required | The Agency ID of the Away Agency. This is the agency on whose facility the transaction took place.<br><br>Refer to Appendix B for valid values. |
| Home Agency ID | Char | 4 | Required | The ID assigned to the Home Agency when transmitting Transaction Data from the Away Hub to the Home Hub.<br><br>Refer to Appendix B for valid values. |
| Transaction Data Sequence Number | Num | 12 | Required | A sequence number generated by the entity creating the Transaction Data unique to that entity across all Transaction Data and Correction Data submissions. Used to correlate the Transaction Data and Reconciliation Data. |
| Record Count | Num | 9 | Required | The number of detail records contained in this submission or web service request.<br><br>Values: 0 – 999999999 |

| Transaction Data Detail Record | | | | |
|---|---|---|---|---|
| **Field** | **Type** | **Max Length** | **Required/ Optional** | **Description** |
| Record Type | Char | 4 | Required | Record Type.<br><br>Values:<br>TB01 – Tag Toll - Barrier Type<br>TC01 – Tag Toll - Closed Type (either from a single entry/exit pair or from a constructed trip comprised of multiple toll zones)<br>TC02 – Tag Toll - Closed Unmatched Type (either from a single entry/exit pair or from a constructed trip comprised of multiple toll zones). Used when either the entry or exit toll zone has been inferred.<br>VB01 – Video Toll - Barrier Type<br>VC01 – Video Toll - Closed Type (either from a single entry/exit pair or from a constructed trip comprised of multiple toll zones)<br>VC02 – Video Toll - Closed Unmatched Type (either from a single entry/exit pair or from a constructed trip comprised of multiple toll zones). Used when either the entry or exit toll zone has been inferred.<br><br>Note: Video Record Types are used when the transaction originates as a Video Transaction. |
| Transaction Reference ID | Num | 20 | Required | The unique reference number for the Away Agency for this transaction. This number is unique across all Record Types (i.e., the same number is not found in two different Record Types). Would be returned in the reconciliation submission to uniquely identify the transaction being reconciled to the Away Agency. This reference ID would also be included in any subsequent adjustment/correction data required for this transaction. |
| Exit Date/Time | Date/Time | 20 | Required | The date/time (UTC) the vehicle exited the facility. For Barrier type transactions, this is the date/time the vehicle used the facility. For Unmatched type transactions, this may be inferred information. |
| Facility ID | Char | 10 | Required | Unique identifier of the facility on which the transaction took place. An Away Agency may have one or more facilities under its control. For example, NJ Turnpike Authority controls both the NJ Turnpike and the Garden State Parkway. This would be a character representation as the Away Agency wants this facility represented on a customer statement. |
| Facility Description | Char | 30 | Required | The facility description that corresponds to the Facility ID. To be used for customer statements as necessary by the Home agency. |
| Exit Plaza | Char | 15 | Required | Unique (for the Facility ID) identifier of the plaza on the facility at which the vehicle exited the facility. For Barrier type transactions, this is the plaza used. For Unmatched type transactions, this may be inferred information. |
| Exit Plaza Description | Char | 30 | Required | The exit plaza description that corresponds to the Exit Plaza. To be used for customer statements as necessary by the Home agency. For Unmatched type transactions, this may be inferred information. |
| Exit Lane | Char | 4 | Required | Lane identifier at which the vehicle exited the facility. For Barrier type transactions, this is the lane used. For Unmatched type transactions, this may be inferred information. |
| Entry Date/Time | Date/Time | 20 | Required for TC and VC transactions | The date/time (UTC) the vehicle entered the facility. For Barrier type transactions, this is unused. For Unmatched type transactions, this may be inferred information. |

| | | | Transaction Data Detail Record | |
|---|---|---|---|---|
| **Field** | **Type** | **Max Length** | **Required/ Optional** | **Description** |
| Entry Plaza | Char | 15 | Required for TC and VC transactions | Unique (for the Facility ID) identifier of the plaza on the facility at which the vehicle entered the facility. For Barrier type transactions, this is unused. For Unmatched type transactions, this may be the inferred information. |
| Entry Plaza Description | Char | 30 | Required for TC and VC transactions | The entry plaza description that corresponds to the Entry Plaza. To be used for customer statements as necessary by the Home agency. For Barrier type transactions, this is unused. For Unmatched type transactions, this may be inferred information. |
| Entry Lane | Char | 4 | Required for TC and VC transactions | Lane identifier at which the vehicle entered the facility. For Barrier type transactions, this is unused. For Unmatched type transactions, this may be inferred information. |
| Tag Agency ID | Char | 4 | Required | An identifier used by NIOP that corresponds to one or more Region and/or Agency field values read directly from a transponder. The Region/Agency fields encoded in a transponder represent the entity that originally issued the transponder. Refer to Appendix C, NIOP Tag Agency ID column for valid values and how they map to actual data encoded on the transponder. If the TVL is used to look-up license plate information for a video transaction, the Tag Agency ID, Tag Serial Number, and Tag Status shall be populated by the Away Agency. Refer to Appendix C for valid values. |
| Tag Serial Number | Char | 10 | Required | Serial Number as read from the transponder. Leading zeroes included. 10 decimal digits 0 – 9 converted to a character field. If the TVL is used to look-up license plate information for a video transaction, the Tag Agency ID, Tag Serial Number, and Tag Status shall be populated by the Away Agency. |
| Tag Status | Char | 1 | Required | Tag Status associated with the Exit Date/Time as determined by the Away Agency from the then active TVL. If the TVL is used to look-up license plate information for a video transaction, the Tag Agency ID, Tag Serial Number, and Tag Status shall be populated by the Away Agency.<br><br>Values:<br>　V – Valid<br>　I – Invalid<br>　Z – Zero/Negative Balance |
| Occupancy Indicator | Char | 1 | Optional | HOV switch position or other means used to indicate vehicle occupancy. For facilities with multiple gantries/toll points that could comprise a trip, this would be the switch position/indicator used to calculate the toll.<br><br>Values:<br>　1 – SOV<br>　2 – HOV2<br>　3 – HOV3+ |
| Vehicle Classification | Char | 4 | Optional | Classification of the vehicle based on the Away Agency's classification structure/rules and used to calculate the Toll Amount. This field does not require validation by the Home Agency. |
| Toll Amount | Num | 9 | Required | Toll amount in Cents. |

| Transaction Data Detail Record | | | | |
|---|---|---|---|---|
| **Field** | **Type** | **Max Length** | **Required/ Optional** | **Description** |
| Discount Plan | Char | 12 | Optional | The discount plan, if any, as determined by the Away Agency that was applicable when calculating the Toll Amount. Used by the Home Agency, if necessary, on the customer statement. Must match to a valid Discount Plan from the TVL for this tag/plate.<br><br>Discount Plans are currently not supported. The definition for this data element will be provided when support for it becomes necessary and/or is defined by NIOP. |
| License Plate Country | Char | 2 | Required (only for V transactions) | Issuing country of the license plate as determined by the Away Agency and matched to the Home Agency data from the TVL.<br><br>Values:<br>  US – United States<br>  CA – Canada<br>  MX – Mexico<br>  "-" – Used for plates not in the referenced documentation.<br><br>If a License Plate Number is provided, the License Plate Country must be provided. |
| License Plate State | Char | 2 | Required (only for V transactions) | Issuing jurisdiction of the license plate as determined by the Away agency and matched to the Home agency data from the TVL.<br><br>Values:<br>  Publication 28, Appendix B – US State abbreviations<br>     http://pe.usps.com/text/pub28/28apb.htm<br>  Publication 28, Appendix A.A32 – Canadian Province abbreviations<br>     http://pe.usps.com/text/pub28/28apa_005.htm<br>  "GS" – Used for plates issued by any Federal agency.<br>  "-" – Used for plates not in the referenced documentation.<br><br>If a License Plate Number is provided, the License Plate State must be provided. |
| License Plate Number | Char | 15 | Required (only for V transactions) | License Plate Number as determined by the Away Agency and matched to the Home Agency data from the TVL. |
| License Plate Type | Char | 30 | Optional (only for V transactions) | License Plate Type as determined by the Away Agency and matched to the Home Agency data from the TVL. If the TVL did not contain a plate type, then it is should not be included. |
| Vehicle Classification Adjustment Flag | Char | 1 | Optional | Used to indicate if the Vehicle Classification presented in the transaction was adjusted by the Away Agency as compared to the TVL tag classification. Allows the Home Agency to include a statement notice, if applicable, indicating that the tag classification was adjusted or to track mismatch frequency.<br><br>Values:<br>  A – Axles adjusted<br><br>It is noted that this field is used by OTA for transactions when the vehicle classification has been adjusted (transactions originating at OTA). |

| Transaction Data Detail Record | | | | |
|---|---|---|---|---|
| **Field** | **Type** | **Max Length** | **Required/ Optional** | **Description** |
| System Matched Flag | Char | 1 | Optional | 0 = System did not force (system) match the entry and exit transaction.<br>1 = System did force (system) match the entry and exit transaction.<br><br>It is noted that this field is used by OTA for transactions originating at OTA that were force matched. |
| Spare 1 | Char | 20 | Optional | Spare field for future growth.<br>Defined by the CUSIOP Hub as the Guaranteed Transaction flag, where 1 = Guaranteed, 0 = Not Guaranteed, blank = not used. |
| Spare 2 | Char | 20 | Optional | Spare field for future growth.<br>Defined by the CUSIOP Hub as the Activation Date and Time of the TVL used to determine the Guaranteed Flag. This field should be in a Date/Time (UTC) format. |
| Spare 3 | Char | 20 | Optional | Spare field for future growth. |
| Spare 4 | Char | 20 | Optional | Spare field for future growth. |
| Spare 5 | Char | 20 | Optional | Spare field for future growth. |
| Exit Date/Time w/TZ | Char | 25 | Required | The date/time with TZ the vehicle exited the facility. For Barrier type transactions, this is the date/time the vehicle used the facility. For Unmatched type transactions, this may be inferred information.<br>Format shall be "YYYY-MM-DDThh:mm:ss±HH:MM. |
| Entry Date/Time w/TZ | Char | 25 | Required if the Entry Date/Time is provided | The date/time with TZ the vehicle entered the facility. For Barrier type transactions, this is the date/time the vehicle used the facility. For Unmatched type transactions, this may be inferred information.<br>Format shall be "YYYY-MM-DDThh:mm:ss±HH:MM.<br><br>For example:<br>2018-10-05T08:15:30-05:00<br>2018-06-06T06:14:30-04:00 |

## 4.3    XML Definition



TransactionData_11
152018.xml

## 4.4    Processing Requirements

N/A

## 4.5    Sample Submission



TransactionDataSa
mple_03182019.xml

# 5 Adjustment/Correction Data

## 5.1 Usage

Correction data shall be created by the Away Hub to replace toll transaction information already sent to a Home Hub and subsequently to the Home Agency. Correction data is intended to inform the Home Agency of updated/corrected information to the original transaction sent. This Data is also used for resubmitting transactions.

## 5.2 Data Records/Fields

| Adjustment/Correction Data Header Record | | | | |
|---|---|---|---|---|
| **Field** | **Type** | **Max Length** | **Required/ Optional** | **Description** |
| Submission Type | Char | 5 | Required | Defines the type of data in the submission or web service request.<br><br>Value: SCORR |
| Submission Date/Time | Date/Time | 20 | Required | The date/time (UTC) the submission was created or web service request was submitted. |
| NIOP Hub ID | Char | 4 | Required | The ID assigned to the Away Hub when transmitting Correction Data from the Away Hub to the Home Hub.<br><br>Refer to Appendix A for valid values. |
| Away Agency ID | Char | 4 | Required | The Agency ID of the Away Agency. This is the agency on whose facility the transaction took place.<br><br>Refer to Appendix B for valid values. |
| Home Agency ID | Char | 4 | Required | The Agency ID of the Home Agency. This is the Home Agency ID assigned where the Correction Data will be sent.<br><br>The Away Agency should specify the Home Agency ID that was returned on the Reconciliation Data submission corresponding to the Transaction Data submission that originally contained the transaction.<br><br>In the event the Hub provided the Reconciliation Data for a transaction where the Reconciliation Data was late or had transaction/content format error, The Home Agency ID should be the Hub ID who provided the Reconciliation Data unless the Away Agency specified the Home Agency to begin with.<br><br>Refer to Appendix A and B for valid values. |

| Adjustment/Correction Data Header Record | | | | |
|---|---|---|---|---|
| **Field** | **Type** | **Max Length** | **Required/ Optional** | **Description** |
| Correction Data Sequence Number | Num | 12 | Required | A sequence number generated by the entity creating the Correction Data unique to that entity across all Transaction Data and Correction Data submissions. Used to correlate the Correction Data and Reconciliation Data.<br><br>As Applicable:<br>The Away Agency generates the unique number when sending Correction Data to the Away Hub.<br><br>The Away Hub generates the unique number when sending Correction Data to the Home Hub, associating their number to the number received from the Away Agency.<br><br>The Home Hub generates the unique number when sending Correction Data to the Home Agency, associating their number to the number received from the Away Hub. |
| Record Count | Num | 9 | Required | The number of detail records contained in this submission.<br><br>Values: 0 – 999999999 |

| Adjustment/Correction Data Detail Record | | | | |
|---|---|---|---|---|
| **Field** | **Type** | **Max Length** | **Required/ Optional** | **Comment** |
| Record Type | Char | 5 | Required | Record Type being adjusted.<br><br>Values:<br>TB01A – Tag Toll - Barrier Type - Adjustment<br>TC01A – Tag Toll - Closed Type – Adjustment<br>TC02A – Tag Toll - Closed Unmatched Type – Adjustment<br>VB01A – Video Toll - Barrier Type – Adjustment<br>VC01A – Video Toll - Closed Type – Adjustment<br>VC02A – Video Toll - Closed Unmatched Type - Adjustment |
| Correction Date/Time | Date/Time | 20 | Optional | The date and time (UTC) the adjustment was made by the Away Agency.<br><br>Required for adjustments. Not required for transaction resubmittals. |

| Adjustment/Correction Data Detail Record | | | | |
|---|---|---|---|---|
| **Field** | **Type** | **Max Length** | **Required/ Optional** | **Comment** |
| Correction Reason | Char | 1 | Optional (Adjustment Reason or Resubmit Reason must be populated; if an adjustment is resubmitted, both must be populated) | The reason for the adjustment.<br><br>Values:<br>C – Class adjusted. Apply toll/class from this record. New toll may be equal to or lower than original toll amount only.<br>I – Ignore original transaction. Back out original transaction (full credit to account).<br>L – Location information corrected. Apply toll/location from this record. New toll may be equal to or lower than original toll amount.<br>T – Toll adjusted. Apply toll from this record. New toll may only be lower than original toll amount.<br>O – Other adjustment/correction. Apply fields from this record. New toll may be equal to or lower than the original toll amount.<br><br>For adjustments where the original transaction is required to be backed out, an "I" must be sent by the Visited Agency before a "C", "L", "T" or "O". |
| Resubmit Reason | Char | 1 | Optional (Adjustment Reason or Resubmit Reason must be populated; if an adjustment is resubmitted, both must be populated) | The reason for the resubmitted transaction or adjustment:<br><br>Values:<br>R – Resubmittal of transaction or adjustment previously rejected with Posting Dispositions of N or T.<br>S – Resubmitted Transaction or adjustment because disposition received by Away Agency with "System/Communication Issue". |
| Other Correction Description | Char | 255 | Required for Adjustment Reason O only | Free form field used by the Away Agency to indicate further details for Adjustment Reason O (Other). |
| Correction Count | Num | 3 | Required | An incrementing sequence number for each adjustment of a Transaction identified by its specific Transaction Reference ID.<br><br>Values: 1 – 999 |
| Resubmit Count | Num | 3 | Required | Incremented every time a transaction or adjustment is resubmitted; This should be 0 the first time an adjustment (Correction Data) is transmitted. |
| Home Agency Reference ID | Num | 20 | Optional | Reference ID provided by the Home Agency within the Reconciliation Submission for either the original transaction or the most recent adjustment/correction. |
| All other fields from the Transaction Data Detail | | | | All fields from the original transaction detail (refer to Transaction Data structure for details) will be retransmitted with the appropriate fields corrected to their required values.<br><br>Notes:<br>1. Transaction Reference ID from the original transaction remains the same for any related adjustment/correction transactions.<br>2. For the "I" Correction Reason, the Toll Amount shall be the negative value of the original Toll Amount or the previous accepted adjustment when multiple adjustments are made.<br>3. The Toll Amount should be the value of the new Toll Amount that needs to be applied at the Home Agency. |

Example:

The original amount is $1.00
The new toll amount value should be $.75

The first adjustment record is an "I" with "-100" as the toll amount.
The second adjustment is "T" with "75" as the toll amount.

## 5.3    XML Definition



CorrectionData_111
52018.xml

## 5.4    Processing Requirements

1.  The Home Agency is responsible for making certain the credit adjustment from the Away Agency is processed before another adjustment.

2.  When an "I" is expected prior to another adjustment, it shall be in the same correction data before the subsequent adjustment/correction record and applied first.

3.  The Correction Data submission from the Away Agency is specific to Home Agency (or Hub).

4.  Adjustment Count and Resubmit Count are incremented as follows:

| Case | Transaction Type | Posting Disposition | Description | SCORR | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | Transaction Type | Adjustment Reason | Adjustment Count | Resubmit Reason | Resubmit Count |
| 1 | Toll | N, T | Toll transaction returned with a disposition of N or T. Transaction is resubmitted. | Toll Resubmittal | N/A | 0 | R | Increment |
| 2 | | S | Toll transaction returned with a disposition of S. Transactions is resubmitted. | System Issue Resubmittal | N/A | 0 | S | Increment |
| 3 | | P | Toll transaction returned with a disposition of P. No action taken. | | | | | |
| 4 | | D, I, C, O | Toll transaction returned with a disposition that may not be resubmitted. No action taken. | | | | | |
| 5 | Toll Adjustment | P | Toll Adjustment where Toll Transaction returned with a disposition of P. | Toll Adjustment | C, I, L, O, T | Increment | N/A | 0 |
| 6 | | N, T | Toll Adjustment returned with a disposition of N or T. Toll Adjustment is resubmitted. | Toll Adjustment | C, I, L, O, T | Do Not Increment | R | Increment |
| 7 | | S | Toll Adjustment returned with a disposition of S. Toll Adjustment is resubmitted. | Toll Adjustment | C, I, L, O, T | Do Not Increment | S | Increment |
| 8 | | D, I, C, O | Toll Adjustment returned with a disposition that may not be resubmitted. No action taken. | | | | | |

## 5.5    Sample Submission



CorrectionDataSam
ple_03182019.xml

# 6 Reconciliation Data

## 6.1 Usage

Reconciliation data shall be created by the Home Hub to inform the Away Hub as to the disposition of transactions/corrections processed. The Away Hub will forward the disposition to the Away Agency per the agreement between those entities.

## 6.2 Data Records/Fields

| Reconciliation Data Header Record | | | | |
|---|---|---|---|---|
| **Field** | **Type** | **Max Length** | **Required/ Optional** | **Description** |
| Submission Type | Char | 6 | Required | Defines the type of data in the submission or web service request.<br><br>Value: SRECON |
| Submission Date/Time | Date/Time | 20 | Required | The date/time (UTC) the submission was created or web service request was submitted. |
| NIOP Hub ID | Char | 4 | Required | The ID assigned to the Home Hub when transmitting Reconciliation Data from the Home Hub to the Away Hub.<br><br>Refer to Appendix A for valid values. |
| Home Agency ID | Char | 4 | Required | The ID assigned to the Home Agency when transmitting Reconciliation Data from the Home Hub to the Away Hub.<br><br>Refer to Appendix B for valid values. |
| Away Agency ID | Char | 4 | Required | The Agency ID of the Away Agency. This is the agency on whose facility the transaction took place. This field should be populated with the Away Agency ID not the Away Hub ID.<br><br>Refer to Appendix B for valid values. |
| Data Sequence Number | Num | 12 | Required | The unique sequence number (Transaction or Correction Data) to which this Reconciliation Data is associated. This is the Transaction Data Sequence Number or the Correction Data Sequence Number. |
| Record Count | Num | 9 | Required | The number of detail records contained in this submission.<br><br>Values: 0 – 999999999 |

| Reconciliation Data Detail Record | | | | |
|---|---|---|---|---|
| **Field** | **Type** | **Max Length** | **Required/ Optional** | **Comment** |
| Transaction Reference ID | Num | 20 | Required | The unique reference number created by the Away Agency for this transaction. This number is unique across all Record Types (i.e., the same number is not found in two different Record Types). Returned in the reconciliation data to uniquely identify the transaction being reconciled to the Away Agency. |

| Reconciliation Data Detail Record | | | | |
|---|---|---|---|---|
| **Field** | **Type** | **Max Length** | **Required/ Optional** | **Comment** |
| Adjustment Count | Num | 3 | Required | The incrementing sequence number for each adjustment of a Transaction identified by its specific Transaction Reference ID. For original Transactions, this field would contain zero (0).

Values: 0 – 999 |
| Resubmit Count | Num | 3 | Required | Incremented every time a transaction or adjustment is resubmitted; This should be 0 the first time a transaction or adjustment is transmitted. |
| Reconciliation Home Agency ID | Char | 4 | Required | The ID assigned to the Home Agency to which the Transaction Data or Correction Data was sent and who responded with the posting disposition.

Refer to Appendix B for valid values. |
| Home Agency Reference ID | Num | 20 | Optional | The unique reference ID created by the Home Agency for this transaction as a result of posting the transaction to a customer account. |
| Posting Disposition | Char | 1 | Required | The processing disposition for the transaction by the Home Agency.

Values indicating Home will pay Away:
P – Posted successfully or accepted. The transaction was accepted by the Home Agency.

Values indicating the transaction was rejected and no funds are due to the Away Agency:
D – Duplicate transaction. Includes exact duplicates as well as duplicates determined by the Home Agency based on its business rule logic. Cannot be resubmitted.
I – Invalid Tag/Plate (tag/plate was communicated as invalid and should not have been sent in the first place). Cannot be resubmitted.
N – Not posted. Transaction was received after the guarantee period or the Tag Status was Zero/Negative Balance and the account had insufficient funds. Can be resubmitted by the Away Agency /Hub if the account is determined as having sufficient funds (based on the most recent Tag Validation List).
S – System or communication issue prevents receiving the Posting Disposition from the Home Agency within the Home Agency Performance SLA for Interoperable transaction processing.  The Away Agency can resubmit with the same Transaction Reference ID and the Home Agency will process the transaction considering the original submission date and applicable guarantee.
T – Transaction content/format error. Transaction could be corrected and resubmitted with the same Transaction Reference ID.
C – Tag/plate not on file. Cannot be resubmitted.
O – Transaction too old. Cannot be resubmitted. |

| | | | | Reconciliation Data Detail Record |
|---|---|---|---|---|
| **Field** | **Type** | **Max Length** | **Required/ Optional** | **Comment** |
| Posted Discount Plan | Char | 12 | Optional | The Away Agency discount plan used when the transaction was posted. This is only applicable when the Home Agency offers the Away Agency discount plan to its customers.<br><br>Discount Plans are currently not supported. The definition for this data element will be provided when support for it becomes necessary and/or is defined by NIOP. |
| Posted Amount | Num | 9 | Required | Toll amount in Cents posted to the account or accepted by the Home Agency and owed to the Away Agency. US Currency. |
| Posted Date/Time | Date/Time | 20 | Required | The date/time (UTC) the Home Agency posted or accepted the transaction to the customer's account. Note, this field is not used for settlement reporting purposes. |
| Transaction Flat Fee | Num | 9 | Required | Flat Fee in cents.<br><br>The Home Hub or Home Agency shall calculate the fees for each Posted (accepted) transaction.<br>Note: Fees may not be applied to transaction adjustments. |
| Transaction Percent Fee | Num | 9 | Required | Percent Fee in cents.<br><br>The Home Hub or Home Agency shall calculate the fees for each Posted (accepted) transaction.<br>Note: Fees may not be applied to transaction adjustments. |
| Spare 1 | Char | 20 | Optional | Spare field for future growth. |
| Spare 2 | Char | 20 | Optional | Spare field for future growth. |
| Spare 3 | Char | 20 | Optional | Spare field for future growth. |
| Spare 4 | Char | 20 | Optional | Spare field for future growth. |
| Spare 5 | Char | 20 | Optional | Spare field for future growth. |

## 6.3 XML Definition



ReconciliationData.
xml

## 6.4 Processing Requirements

1. Prior to sending the Reconciliation Data submission, the Home Hub shall verify each Transaction Data detail record has a corresponding Reconciliation Data detail record; and no unmatched Reconciliation Data records have been included in the Reconciliation Data submission.

2. In the event the Hub provided the Reconciliation Data for a transaction where the Reconciliation Data was late, had transaction/content format error or Tag/plate not on file, the Home Agency ID should be the Hub who provided the Reconciliation Data unless the Away Agency specified the Home Agency to begin with.

## 6.5   Sample Submission



ReconciliationData
Sample_10112016_sr

# 7    Acknowledgement Data

## 7.1    Usage

Acknowledgment data shall be created by the Hub which received the file or web service request to inform the Hub which sent it that the data transmitted was received in its entirety. Acknowledgement data shall be sent for each of the previously referenced files or web service requests.

The TVL acknowledgements shall be implemented via SFTP and the transaction, correction, and reconciliation data acknowledgements shall be implemented via Web Services.

Specific to acknowledgment of a Tag Validation List (TVL) Data file, an initial Acknowledgement Data file shall be sent back to the Hub which sent the TVL.  Additionally, a second Acknowledgement submission with Return Code value '10' shall be created by the Away Hub and shall be sent to the Home Hub to provide the date/time the TVL is considered active by the Away Hub and all of its Local Agencies. Please refer to section 7.4, "Return Code".

Specific to acknowledgement of a Reconciliation Data (SRECON) submission, an initial Acknowledgement shall be sent back to the Hub which sent the SRECON.  Additionally, a second Acknowledgement submission with Return Code value '13' shall be created by the Away Hub based on the SRECON ACK received from the Away agency. This second ACK will be used for Reconciliation reporting. Please refer to section 7.4, "Return Code".

## 7.2    File Data Exchange over SFTP

File Name: {NIOP HUB_ID}_{FROM_AGENCY_ID}_{FILE_NAME_{RETURN CODE}}_FILE_TYPE}.ACK

First ACK for a TVL:
Example: 9001_9001_9002_9002_20171201001015_00_BTVL.ACK
Second ACK for a TVL:
Example: 9001_9001_9002_9002_20171201001015_10_BTVL.ACK

First ACK for an SRECON:
Example:  9002_9002_9001_0035_0040_20171201041015_00_SRECON.ACK

Second ACK for an SRECON:
Example:  9002_9002_9001_0035_0040_20171201041015_13_SRECON.ACK

## 7.3    Data Exchange using Web Services over VPN

Provider:  Hub which sent a web service request

Consumer:  Hub which received a web service request

Trigger: Hub upon receiving a web service request confirms the content is either acceptable for processing or determines the content cannot be processed.

Operation: Synchronous Request-Response.

Format:  WSDL

## 7.4    Data Record/Fields

| Acknowledgement Data Detail Record | | | | |
|---|---|---|---|---|
| **Field** | **Type** | **Max Length** | **Required/ Optional** | **Comment** |
| Submission Type | Char | 3 | Required | Defines the type of data in the file or web service request.<br><br>Value: ACK |
| Original submission Type | Char | 10 | Required | The submission type of the original file or web service request being acknowledged as received from the To Agency ID.<br><br>This value together with the field below uniquely identifies the original submission. |
| Original Submission Date/Time | Date/time | 20 | Required | The submission date/time (UTC) provided in the header of the original file or web service request being acknowledged as received from the To Agency ID.<br><br>This value together with the field above uniquely identifies the original submission. |
| NIOP Hub ID | Char | 4 | Required | As Applicable:<br>The ID assigned to the "To" Hub when transmitting Acknowledgement Data from the "From" Agency to the "To" Hub.<br><br>The ID assigned to the "From" Hub when transmitting Acknowledgement Data from the "From" Hub to the "To" Hub.<br><br>The ID assigned to the "From" Hub when transmitting Acknowledgement Data from the "From" Hub to the "To" Agency.<br><br>Refer to Appendix A for valid values. |
| From Agency ID | Char | 4 | Required | The Agency/Hub generating the acknowledgement.<br><br>Refer to Appendix A and B for valid values. |
| To Agency ID | Char | 4 | Required | The Agency/Hub that originated the file or submission being acknowledged.<br><br>Refer to Appendix A and B for valid values. |
| ACK Date/Time | Date/Time | 20 | Required | The acknowledgement date/time (UTC); or in case of Return Code 13, the Reconciliation Date/Time; or in the case of Return Code 10, the Activation Date/Time. |

| Acknowledgement Data Detail Record | | | | |
|---|---|---|---|---|
| **Field** | **Type** | **Max Length** | **Required/ Optional** | **Comment** |
| Return Code | Char | 2 | Required | A code indicating the status of the submission being acknowledged. |
| | | | | Values: |
| | | | | 00 – Submission was successfully received and verified. Submission is accepted and processed. |
| | | | | 01 – Header record count does not match the number of detail records found in the submission. Entire submission is rejected. |
| | | | | 02 – Detail record(s) found with invalid data. Remainder of submission was processed. Submission is partially accepted and processed. |
| | | | | 03 – Sanity check failure. (Bulk TVL - Sanity checks failed. Differential TVL – Bulk Identifier was invalid.) Submission is rejected and not processed. |
| | | | | 04 – Transaction Reconciliation Data (or Correction Reconciliation Data) does not match corresponding Transaction Data (or Correction Data). The number of reconciliation records do not match the number of records in the original transaction submission) (Reconciliation Data only – partial reconciliation) Submission is rejected and not processed. |
| | | | | 05 – Duplicate submission sequence number. The entire submission is rejected and not processed. |
| | | | | 07 – Invalid ZIP file or other file structure defect, for data file exchange over SFTP.  Invalid data resulting in rejection of entire data submission, for data exchange using web services. The entire submission is rejected and not processed. |
| | | | | 10 – Acknowledgement date/time of a TVL at Away Hub communicating the operative date/time of the TVL for purposes of comparison to transaction date/time. Second ACK of the TVL only. |
| | | | | 11 – Reconciliation calculations are incorrect (toll amounts and fees may have a calculation error). (ACK to a Reconciliation Data) Submission is accepted and processed. |
| | | | | 12 – File received late. This is used when a TVL or Reconciliation Data is received after the allotted time.  For TVLs the previous TVL will be used. The entire submission is rejected and not processed. |
| | | | | 13 – SRECON Reconciliation Date/Time created by the Away Hub based on the Away Agency's Acknowledgement of the SRECON data submission. Note, this date/time would be used for reconciliation reporting. If the date/time falls within the current reconciliation period, all reconciliation records in the associated Reconciliation submission with a Posting Disposition value of "P" shall be paid from the Home agency to the Away Agency. |

**7.5     XML Definition**



Acknowledgement.
xml

**7.6     Processing Requirements**

1.  This file or web service request shall contain a single record only. For each data submission received by a Hub, the Hub shall generate Acknowledgement data and transmit the file or web service request back to the Hub which sent the data submission.

2.  The ACK Date/Time (UTC) field shall be used by the Hub which sent the original data submission as the acknowledgement date/time of the transmitted data.

3.  The Hub that received a file or web service request shall generate a report showing all detail records that were skipped due to invalid data (RETURN_CODE = '02') and shall have this report available, if needed, for the Hub that sent the data submission.

4.  Specific to acknowledgment of a Tag Validation List (TVL) Data file, an initial Acknowledgement Data file shall be sent back to the Hub which sent the TVL.  Additionally, a second Acknowledgement Data file with Return Code value '10' shall be sent to provide the date/time the TVL is considered operative by the Away Hub and all of its local Agencies. The second Acknowledgement Data file will only be sent after an initial Acknowledgement Data file with Return Code '00' or '02' has already been delivered.

5.  Specific to acknowledgement of an SRECON data submission, an initial Acknowledgement shall be sent back to the Hub which sent the SRECON.  Additionally, a second Acknowledgement submission with Return Code value '13' shall be created by the Away Hub based on the SRECON ACK received from the Away agency.  This submission contains the Reconciliation Date/Time (UTC) that will be communicated to the Home Agency, through the Home Hub when applicable.  If the Reconciliation Date/Time falls within the current reconciliation period, all reconciliation records in the associated Reconciliation submission with a Posting Disposition value of "P" shall be paid from the Home agency to the Away Agency for the current reconciliation period.

**7.7     Sample Submission**



AcknowledgementSa
mple.xml

## Appendix A:  NIOP Hub IDs

The NIOP Hubs are assigned a numeric ID value. These values are listed in <u>NIOP ICD Appendix A – RELEASED YYYYMMDD.xlsx</u>.

## Appendix B:  NIOP Agency IDs

The agencies participating in National Interoperability are assigned unique Agency IDs. The NIOP Agency IDs listed in <u>NIOP ICD Appendix B – Last Update RELEASED.xlsx</u> are the values to be used for the "Home Agency ID" and "Away Agency ID" fields in the Tag Validation List and Transaction Data.

Each NIOP Agency may only be nationally interoperable through one Hub.

## Appendix C:  NIOP Tag Agency IDs

A single RFID transponder must be uniquely identifiable by all members of NIOP. A transponder is identified by the combination of the NIOP Tag Agency ID and Tag Serial Number.

RFID transponders are encoded with an agency designation. The agency designation of a particular tag is encoded in accordance with the particular communication protocol to which the tag responds. A single tag may respond to one or more communications protocol. Developers of tag reader interfaces (e.g., lane controllers, POS terminals) require these specific agency designations to determine the NIOP Tag Agency ID.

This table in <u>NIOP ICD Appendix C – RELEASED YYYYMMDD.xlsx</u> defines the NIOP Tag Agency ID. The Agency designation encoding for each tag communication protocol is listed. The Tag Agency ID is intended to designate a specific RFID transponder, irrespective of the tag communication protocol used to acquire the transponder read.

The Tag Agency IDs in <u>NIOP ICD Appendix C – RELEASED YYYYMMDD.xlsx</u> are the values to be used for the "Tag Agency ID" fields in the Tag Validation List and Transaction Data.

## Appendix D:  Tag Validation List Schedule

The Tag Validation List schedules are included in this section. These schedules may change from time to time.

The content of this section is located in <u>NIOP ICD Appendix D – RELEASED YYYYMMDD.xlsx.</u>

## Appendix E:  License Plate Types

The defined License Plate Types are included in this section.

The content of this section is located in <u>NIOP ICD Appendix E – RELEASED YYYYMMDD.xlsx.</u>