



National Interoperability
Interface Control Document
Version 2.0

FINAL

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Modification History

Date	Version	Modifications
September/ October 2018	NIOP X.XX	<ol style="list-style-type: none"> 1. Conformed the Southern States Interoperability ICD to National Interoperability ICD. 2. Incorporated revisions requested by the NIOP Working group. <ol style="list-style-type: none"> 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.] b. Add GS and US as License Plate State Codes. [Removed US in November 2018.] c. Update Tag Agency ID Appendix. d. Updated Tag ID to 10 characters. e. Use of the word “Local” (Local Hub/Local Agency). Add to Definitions, if needed. f. Updated Classification Fields to be 4 characters and optional. g. Updated Tag Class Fields to be 4 characters and not optional. h. Edited XML Definitions. i. Conform document to NIOP: <ol style="list-style-type: none"> i. Edited Southern States ICD to conform to NIOP. ii. Replaced Southern States specific drawing with NIOP map. iii. Removed abbreviations and terms that are no longer used. iv. Added Table from M. Kolb & added ATA column. v. Cross-referenced Agencies with Hubs. j. Changed the reference to IBR-REC 6 to IBR-REC-7. 3. Moved appendices to separate documents.
November 2018	NIOP 1.00	<p>Edited based on NIOP Technical Meeting November 7-8, 2018. Added XML Definitions and samples from ETCC. Removed remaining SSIOPs and references. 11/26/18: As suggested by M. Kolb:</p> <ol style="list-style-type: none"> 1. Removed “CSC” where appropriate. 2. Section 1, Introduction: The table column labeled “File Extension” may be better titled “File Extension / Submission Type” 3. Removed or replaced “file” with “submission” where appropriate.
February 2019	NIOP 1.01	<p>Added Appendix E License Plate Types. Corrected Appendix naming convention.</p>
March 2019	NIOP 1.02	<p>Added revised XML examples.</p>
May 2019	NIOP 1.02 FINAL	<p>Removed DRAFT, updated date and made FINAL.</p>
September 2022	NIOP 1.03	<p>Incorporated revisions requested by the NIOP Working Group.</p> <ol style="list-style-type: none"> 1. Added Appendix F and updated references in Tag Validation List and Transaction Data sections for State Code. 2. Added Plate Validation List specifications. 3. Updated Correction Reason to include Duplicate Resubmission for Adjustment and Correction Data. 4. Updated Correction Count value from 1-999 to 0-999. 5. Reconciliation Data <ol style="list-style-type: none"> a. Updated Posted Disposition to include Duplicate Resubmission. b. Updated Posted Amount to be a negative number. c. Added Duplicate Transaction Reference ID related to Duplicate Resubmissions.

Date	Version	Modifications
		<ul style="list-style-type: none"> d. Added to the description for the Posted Toll, specifying the amount should be negative when an 'I' (Ignore) adjustment is posted.
September 2022	NIOP 1.04	<p>Edited based on NIOP meeting, September 17, 2022 at IBTTA Annual Meeting, as follows:</p> <p>Accepted additions for Interoperability using License Plates Only.</p> <p>NOTE: Additions are listed to see all revisions from the Final 1.02 version.</p>
January 2023	NIOP 1.05	Clarified NIOP Hub ID.
March and April 2023	NIOP 2.0	<p>Incorporated revisions requested by the NIOP Working Group.</p> <ol style="list-style-type: none"> 1. Added "PVL" as appropriate where TVL is referenced. 2. Added "NIOP" to all Appendix references. 3. Added "license" to all references for license plate. 4. Additional details for XML file extension in General Data Requirements. 5. Updated all dash references for License Plate Country and License Plate State fields. 6. Edited XML definitions. 7. Tag Validation List Detail Record updates <ul style="list-style-type: none"> a. Tag Type length to be 2 characters to allow for Type Value and Mounting Value to the Tag Validation List detail record. b. Simplified description for License Plate Effective From, License Plate Effective To, Account Number, and Fleet Indicator fields. c. Added Guarantee Indicator to the TVL. 8. Removed TVL Processing Requirement referencing tag associated with multiple license plates and plate associated with multiple tags [NIOP Business Rule NIOP-ACC-4] 9. Moved Account Number and Fleet Indicator fields to the end of the Plate Validation List Detail Record section. 10. Revised PVL Processing Requirement referencing when a license plate becomes invalid for tolling. 11. Added Transaction Data Processing Requirement for video transactions where the license plate matches records in the TVL or PVL. 12. Adjustment/Correction Data Detail Record updates <ul style="list-style-type: none"> a. Additional details added to Correction Reason field's comment for \$0.00 toll transactions. b. Moved Duplicate Resubmission from Correction Reason to Resubmit Reason field. c. Updated Correction Count value from 1-999 to 0-999 and clarified resubmitted transaction should have Correction Count = 0. 13. Added Adjustment/Correction Processing Requirement for resubmission of a duplicate transaction. 14. Additional comments for D (duplicate transaction), N (not posted), T (transaction content/format error), and C (tag/license plate not on file) Posting Disposition of the Reconciliation Data Detail Record section.
May 2023	NIOP 2.0	Removed "DRAFT" and made FINAL with approval from the National Interoperability group at IBTTA Tech Summit in Indianapolis, IN.

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.
Plate Validation List	{Bulk Identifier}PVL	Plate Validation List (PVL) data shall be created by each Home Agency that has license plates that are not associated with Tags. The PVL will inform the Away Hubs and Agencies as to the status of license plates that are not associated with a Tag but are considered interoperable by a 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 or PVL active at the time of the transaction. 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 and Plate 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 file names including the file name extension 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>
```

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. For Hub to Hub, this section applies to the TVL and PVL.

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

To:

/SEIOPHUB/{env}/inbound/STVL/current

7. If the file transfer fails, the Other Hub shall delete the file from the “/temp” directory.

Outbound Files from a Hub to another Hub (“Other Hub”):

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. 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. Refer to NIOP Appendix A for valid values. Note: The NIOPHubID in the XML Definition is SSIOPHubID.

Tag Validation List Header 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. For consolidated TVLs this is the Home Hub ID. Refer to NIOP Appendix A for valid values.
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/license 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/license plate data and/or updates in tag/license plate status. Values: B – Bulk 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. 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. Refer to NIOP Appendix B for valid values.
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 NIOP 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.

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Tag Validation List Detail Record				
Field	Type	Max Length	Required/ Optional	Description
Tag Status	Char	1	Required	<p>Tag Status.</p> <p>Values: V – Valid (applies to both Bulk and Differential TVL) Z – Zero/Negative Balance (applies to both Bulk and Differential TVL) I – Invalid (only used for Differential TVL).</p> <p>Notes: 1. Omitting a tag from a Bulk TVL automatically makes the tag Invalid. 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.</p>
For each Discount Type, there would be an array with the following fields:				
Discount Plans	Char	12	Optional	<p>An array of Regional or NIOP supported discount plans associated with the transponder. Would also be used to support cross agency non-revenue status.</p> <p>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.</p>
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	2	Optional	<p>Type of transponder (first character) and expected Mounting location (second character). If not specified, no assumptions should be made.</p> <p>Type (first character) Values: F – Feedback (supports sounds, LEDs and/or LCD) G – Feedback and Switchable H – Hardcase including portable hangtag transponders S – Switchable (supports occupancy selection) T – Sticker (non-portable) V – Vehicle Integrated such as the rearview mirror module. Would have a Mounting value of “V”. If the unit supported Feedback and/or Switchable capabilities, then values of ‘F’, ‘G’ or ‘S’ should be used here instead. * - If the Type Value is not available but Mounting Value will be provided.</p> <p>Mounting (second character) Values: I – Interior L – License Plate R – Roof Mount H – Headlamp V – Vehicle Integrated * - If the Mounting Value is not available but Type Value will be provided.</p> <p>If neither Type Value nor Mounting Value is available, this field can be omitted completely.</p>

Tag Validation List Detail Record				
Field	Type	Max Length	Required/ Optional	Description
Tag Class	Num	4	Required	The number of axles associated with the tag. Default to "2" axle when not available. Values 2-15. Note: 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 license plates with the following fields.				
License Plate Country	Char	2	Optional	Country code associated with the license plate. Values: US – United States CA – Canada MX – Mexico — A dash is used for license plates not in the referenced documentation in "License Plate State". If a License Plate Number is provided, the License Plate Country must be provided.
License Plate State	Char	2	Optional	Refer to NIOP Appendix F, State Code column for valid values. Description column has full name. Home Agencies who send 'MX' as the state code in the TVL accepts responsibility that a license plate with any defined Mexico state may be matched to the license plate. — A dash is used for license plates not referenced in NIOP Appendix F. If a License Plate Number is provided, the License Plate State must be provided.
License Plate Number	Char	15	Optional	License 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 license plate.
License Plate Type	Char	30	Optional	Refer to NIOP Appendix E, License 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 license plate based transactions.
License Plate Registration Date	Date/Time	20	Optional	Date/time (UTC) license plate became associated to the current Tag. If not provided, is set to the date first seen in this record. The License Plate Registration Date is not the DMV registration date. It is strongly recommended that this field be populated by the Home Agency.
License Plate Effective From	Date/Time	20	Optional	Beginning of the period in which the license plate is eligible for matching to toll transactions. If not provided, is assumed to be effective when first seen in this record. It is strongly recommended that this field be populated by the Home Agency.

Tag Validation List Detail Record				
Field	Type	Max Length	Required/ Optional	Description
License Plate Effective To	Date/Time	20	Optional	End of the period in which the license plate is eligible for matching to toll transactions. If not provided, is assumed to still be effective as of the date of this record. When the license plate is no longer associated to the current Tag or if Tag becomes invalid, a line item shall be included in the next Differential TVL for the Tag with this field set to the date/time the license plate was no longer eligible. .
Guarantee Indicator	Char	1	Optional	Flag used to denote whether or not the indicated license plate is guaranteed by the Home Agency for the toll payment for Video Transactions. If indicator is not provided, it is assumed the payment is not guaranteed. Values: Y – Payment is guaranteed N – Payment is not guaranteed
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 license plate data. May not be provided for all agencies. It is strongly recommended that this field be populated by the Home Agency.
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 or vehicle sharing company, etc.). If indicator is not provided, account is assumed to not be a fleet account and defaults to 'N'. Values: Y – Account is a fleet account N – Account is not a fleet account It is strongly recommended that this field be populated by the Home Agency.

3.4 XML Definition



TagValidationList_0
4042023.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 License Plate is not forwarded to the Away Agency when rejected, the Away Agency will treat any transactions associated with the Tag or License 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 license 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. 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 license plate association ended by setting the License Plate Effective To value); the second for the new Tag (showing the license plate association by setting the License Plate Effective From value). The next Bulk TVL would include only the new Valid Tag with the associated license plate.
11. 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.
12. When a tag is associated with multiple Home Agencies, the Away Agency will attempt to post to the Home Agency the tag was recently active first. If rejected, the Away Agency may attempt to post to another Home Agency.

3.6 Sample Submission

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



TagValidationListSample_04142023.txt

4 Plate Validation List (PVL) Data

4.1 Usage

Plate Validation List (PVL) data shall be created by each Home Agency to inform the Away Hubs and Agencies as to the status of license plates associated with an account held by the Home Agency but are not necessarily associated with Tags. The Home Hub will combine PVLs from each Home Agency before sending the PVL to the Other Hub(s). The Away Hub forwards the PVL information to each Away Agency in the format agreed upon between the entities.

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

4.2 File Name

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

Example: 9002_9002_20171201001015.BPVL

4.3 Data Records/Fields

Plate Validation List Header Record				
Field	Type	Max Length	Required/ Optional	Description
Submission Type	Char	4	Required	Defines the type of data in the file. Value: SPVL
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 Plate Validation Data from the Home Hub to the Away Hub. Refer to NIOP Appendix A for valid values. Note: The NIOPHubID in the XML Definition is SSIOPHubID.
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. For consolidated PVLs this is the Home Hub ID. Refer to NIOP Appendix A for valid values.

Plate 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 PVL) or differential update (Differential PVL). Bulk updates shall replace all previously transmitted license plate data for the Home Agency ID. Differential updates shall contain all changes since the last Bulk and shall be used to indicate new license plate data and/or updates in license plate effective dates. Values: B – Bulk D – Differential
Bulk Identifier	Num	9	Required	Incremental Identifier for each Bulk PVL 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. Values: 0 – 9999999999

Plate 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. Refer to NIOP Appendix B for valid values.
License Plate Country	Char	2	Required	Country code associated with the license plate. Values: US – United States CA – Canada MX – Mexico – A dash is used for license plates not in the referenced documentation in “License Plate State”.
License Plate State	Char	2	Required	Refer to NIOP Appendix F, State Code column for valid values. Description column has full name. Home Agencies who send ‘MX’ as the state code in the TVL accepts responsibility that a license plate with any defined Mexico state may be matched to the license plate. – A dash is used for license plates not referenced in NIOP Appendix F. If a License Plate Number is provided, the License Plate State must be provided.
License Plate Number	Char	15	Required	License 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 license plate.
License Plate Type	Char	30	Optional	Refer to NIOP Appendix E, License 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 license plate-based transactions.

National Interoperability Interface Control Document

Plate Validation List Detail Record				
Field	Type	Max Length	Required/ Optional	Description
License Plate Registration Date	Date/Time	20	Optional	Date/time (UTC) license plate became associated to the current account. If not provided, is set to the date first seen in this record. The License Plate Registration Date is not the DMV registration date. It is strongly recommended that this field be populated by the Home Agency.
License Plate Effective From	Date/Time	20	Optional	Beginning of the period in which the license plate is eligible for matching to toll transactions. If not provided, is assumed to be effective when first seen in this record. It is strongly recommended that this field be populated by the Home Agency.
License Plate Effective To	Date/Time	20	Optional	End of the period in which the license plate is eligible for matching to toll transactions. If not provided, is assumed to still be effective as of the date of this record. When the license plate is no longer valid for tolling, a line item shall be included in the next Differential PVL for the license plate with this field set to the date/time the license plate was no longer valid. The next Bulk PVL would exclude the license plate unless it was associated with an account and was valid for tolling.
Vehicle Make	Char	40	Optional	
Vehicle Model	Char	40	Optional	
Guarantee Indicator	Char	1	Required	Flag used to denote whether or not the indicated license plate is guaranteed by the Home Agency for the toll payment. If indicator is not provided, it is assumed the payment is not guaranteed. Values: Y – Payment is guaranteed N – Payment is not guaranteed
Account Number	Char	50	Optional	The unique account number at the Home Agency of the associated license plate data. May not be provided for all agencies. It is strongly recommended that this field be populated by the Home Agency.
Fleet Indicator	Char	1	Optional	Flag used to denote whether or not the indicated license plate is associated with a fleet account (e.g., rental car or shared vehicle company, etc.). If indicator is not provided, account is assumed to not be a fleet account and defaults to 'N'. Values: Y – Account is a fleet account N – Account is not a fleet account It is strongly recommended that this field be populated by the Home Agency.

4.4 XML Definition



PlateValidationList_
01192023.xml

4.5 Processing Requirements

1. Consolidated PVLs (not Agency-specific PVLs) will be sent from the Home Hub to each Away Hub.
2. The Home Hub shall only include license plate data for license plates and 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, or if its license plates are not nationally interoperable, the license plates should not be included in the PVL.
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 Effective Date combination, 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 Hub will continue to process and use the remaining records in the PVL. 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 License Plate is not forwarded to the Away Agency when rejected, the Away Agency will treat any transactions associated with the License Plate as no match on PVL.
6. The Home Hub shall perform appropriate sanity checks on the Bulk PVL data file prior to its transmission to the Away Hub. The Away Hub shall perform appropriate sanity checks on the Bulk PVL 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 license plates from previous version, initially set to (recommended 3-5%)
 - b. Acknowledgement Data with Return Code of 03 should be used when the sanity checks fail.
7. The Home Hub shall only include information for license plates which are associated to accounts managed by a Home Agency certified with the Hub.
8. The frequency of Bulk PVL data file transmissions shall be as stipulated in the Business Rules.
9. The frequency of Differential PVL data file transmissions shall be as stipulated in the Business Rules.
10. When a license plate becomes invalid for tolling, the next Differential PVL License Plate Effective To date should be set to the date/time of the Differential PVL to set the cutoff for when the license plate was last valid. The next Bulk PVL would exclude the license plate.

4.6 Sample Submission



PlateValidationListSample_01192023.xml

5 Transaction Data

5.1 Usage

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

5.2 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. 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. Refer to NIOP Appendix A for valid values. Note: The NIOPHubID in the XML Definition is SSIOPHubID.
Away Agency ID	Char	4	Required	The Agency ID of the Away Agency. This is the agency on whose facility the transaction took place. Refer to NIOP 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. Refer to NIOP 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. Values: 0 – 999999999

National Interoperability Interface Control Document

Transaction Data Detail Record				
Field	Type	Max Length	Required/ Optional	Description
Record Type	Char	4	Required	<p>Record Type.</p> <p>Values:</p> <p>TB01 – Tag Toll - Barrier Type</p> <p>TC01 – Tag Toll - Closed Type (either from a single entry/exit pair or from a constructed trip comprised of multiple toll zones)</p> <p>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.</p> <p>VB01 – Video Toll - Barrier Type</p> <p>VC01 – Video Toll - Closed Type (either from a single entry/exit pair or from a constructed trip comprised of multiple toll zones)</p> <p>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.</p> <p>Note: Video Record Types are used when the transaction originates as a Video Transaction.</p>
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.

National Interoperability Interface Control Document

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 for T transactions and V transactions with license plates in the TVL. Not required for V transactions with license plates in the PVL	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 NIOP 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 NIOP Appendix C for valid values.
Tag Serial Number	Char	10	Required for T transactions and V transactions with license plates in the TVL. Not required for V transactions with license plates in the PVL	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 for T transactions and V transactions with license plates in the TVL. Not required for V transactions with license plates in the PVL	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. Values: V – Valid I – Invalid 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. Values: 1 – SOV 2 – HOV2 3 – HOV3+

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Transaction Data Detail Record				
Field	Type	Max Length	Required/ Optional	Description
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.
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/license plate. 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. Values: US – United States CA – Canada MX – Mexico – A dash is used for license plates not in the referenced documentation. If a License Plate Number is provided, the License Plate Country must be provided.
License Plate State	Char	2	Required (only for V transactions)	Refer to NIOP Appendix F, State Code column for valid values. Description column has full name. Home Agencies who send 'MX' as the state code in the TVL or PVL accepts responsibility that a license plate with any defined Mexico state may be matched to the license plate. – A dash is used for license plates not referenced in NIOP Appendix F. 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 or PVL.
License Plate Type	Char	30	Optional (only for V transactions)	Refer to NIOP Appendix E, License Plate Type as determined by the Away Agency and matched to the Home Agency data from the TVL or PVL. If the TVL or PVL did not contain a License Plate Type, then it should not be included. If the License Plate Type is provided in the TVL or PVL, it should be provided in the transaction data.

Transaction Data Detail Record				
Field	Type	Max Length	Required/ Optional	Description
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. Values: A – Axles adjusted It is noted that this field is used by OTA for transactions when the vehicle classification has been adjusted (transactions originating at OTA).
System Matched Flag	Char	1	Optional	0 = System did not force (system) match the entry and exit transaction. 1 = System did force (system) match the entry and exit transaction. 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. Defined by the CUSIOP Hub as the Guaranteed Transaction flag, where 1 = Guaranteed, 0 = Not Guaranteed, blank = not used. Note: Spare 1 in the XML Definition is used by CUSIOP Hub for Guaranteed Transaction flag.
Spare 2	Char	20	Optional	Spare field for future growth. Defined by the CUSIOP Hub as the Activation Date and Time of the TVL or PVL used to determine the Guaranteed Flag. This field should be in a Date/Time (UTC) format. Note: Spare 2 in the XML Definition is used by CUSIOP Hub for Activation Date and Time.
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. 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. Format shall be “YYYY-MM-DDThh:mm:ss±HH:MM. For example: 2018-10-05T08:15:30-05:00 2018-06-06T06:14:30-04:00

5.3 XML Definition



TransactionData_04
042023.xml

5.4 Processing Requirements

1. If a transaction originates as a Video Transaction and the License Plate matches to a record in the TVL, the submitted transaction should be a Video Transaction that contains the Tag ID and License Plate data.
2. If a transaction originates as a Video Transaction and the License Plate matches to a record in the PVL, the submitted transaction should be a Video Transaction that contains the License Plate data.
3. If a transaction matches to a License Plate from the TVL or PVL where the License Plate data in the TVL or PVL contains a License Plate Type, the transaction must be matched to the License Plate Data using the License Plate, License Plate State, License Plate Country and License Plate Type.

5.5 Sample Submission



TransactionDataSa
mple_03182019.xml

6 Adjustment/Correction Data

6.1 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.

6.2 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. Value: SCORR
Submission Date/Time	Date/Time	20	Required	The date/time (UTC) the submission was created or web service request was submitted.
NIOPI Hub ID	Char	4	Required	The ID assigned to the Away Hub when transmitting Correction Data from the Away Hub to the Home Hub. Refer to NIOPI Appendix A for valid values. Note: The NIOPIHubID in the XML Definition is SSIOPHubID.
Away Agency ID	Char	4	Required	The Agency ID of the Away Agency. This is the agency on whose facility the transaction took place. Refer to NIOPI 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. 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. 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. Refer to NIOPI Appendix A and B for valid values.

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Adjustment/Correction Data Header Record				
Field	Type	Max Length	Required/ Optional	Description
Correction Data Sequence Number	Num	12	Required	<p>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.</p> <p>As Applicable: The Away Agency generates the unique number when sending Correction Data to the Away Hub.</p> <p>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.</p> <p>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.</p>
Record Count	Num	9	Required	<p>The number of detail records contained in this submission.</p> <p>Values: 0 – 999999999</p>

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

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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)	<p>The reason for the adjustment.</p> <p>Values: C – Class adjusted. Apply toll/class from this record. New toll may be equal to or lower than original toll amount only. I – Ignore original transaction. Back out original transaction (full credit to account). L – Location information corrected. Apply toll/location from this record. New toll may be equal to or lower than original toll amount. T – Toll adjusted. Apply toll from this record. New toll may only be lower than original toll amount, but not zero (a toll credit for the entire toll amount should use Correction Reason ‘I’ only). O – Other adjustment/correction. Apply fields from this record. New toll may be equal to or lower than the original toll amount.</p> <p>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”.</p>
Resubmit Reason	Char	1	Optional (Adjustment Reason or Resubmit Reason must be populated; if an adjustment is resubmitted, both must be populated)	<p>The reason for the resubmitted transaction or adjustment:</p> <p>Values: D – Duplicate Resubmission. R – Resubmittal of transaction or adjustment previously rejected with Posting Dispositions of N or T. S – Resubmitted Transaction or adjustment because disposition received by Away Agency with “System/Communication Issue”.</p>
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	<p>An incrementing sequence number for each adjustment of a Transaction identified by its specific Transaction Reference ID. A resubmitted transaction that is not an adjustment should have a Correction Count of 0.</p> <p>Values: 0 – 999</p>
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.

Adjustment/Correction Data Detail Record				
Field	Type	Max Length	Required/ Optional	Comment
All other fields from the Transaction Data Detail				<p>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.</p> <p>Notes:</p> <ol style="list-style-type: none"> 1. Transaction Reference ID from the original transaction remains the same for any related adjustment/correction transactions. 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. 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.

6.3 XML Definition



CorrectionData_040
42023.xml

6.4 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:

National Interoperability Interface Control Document

Case				SCORR				
	Transaction Type	Posting Disposition	Description	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.					

- Resubmission of a transaction with a Resubmit Reason of “D” can only be done for transactions that were previously reconciled with a Posting Disposition of “D” and for which the Home Agency provided the Duplicate Transaction Reference ID. The Away Agency shall verify that the transaction is not a duplicate prior to resubmission and shall, upon request by the Home Agency, make available to the Home Agency the details of such verification including logs, transaction records, images and video footage, etc.

6.5 Sample Submission



CorrectionDataSample_03182019.xml

Reconciliation Data

6.6 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.

6.7 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. Value: SRECON
Submission Date/Time	Date/Time	20	Required	The date/time (UTC) the submission was created or web service request was submitted.
NIOPI Hub ID	Char	4	Required	The ID assigned to the Home Hub when transmitting Reconciliation Data from the Home Hub to the Away Hub. Refer to NIOPI Appendix A for valid values. Note: The NIOPIHubID in the XML Definition is SSIOPHubID.
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. Refer to NIOPI 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. Refer to NIOPI 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. 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 NIOP 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.

Reconciliation Data Detail Record				
Field	Type	Max Length	Required/ Optional	Comment
Posting Disposition	Char	1	Required	<p>The processing disposition for the transaction by the Home Agency.</p> <p>Values indicating Home will pay Away: P – Posted successfully or accepted. The transaction was accepted by the Home Agency.</p> <p>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. May be resubmitted with a Correction Reason of “D” (Duplicate) after the Away Agency has verified that the transaction is not actually a duplicate and the Transaction Reference ID is provided in the SRECON by the Home Agency. I – Invalid Tag/License Plate (tag/license plate was communicated as invalid and should not have been sent in the first place). Cannot be resubmitted. N – Not posted. Transaction was not guaranteed and could not be processed. The transaction can be resubmitted by the Away Agency /Hub with the same Transaction Reference ID. 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. If the transaction data is matched to the TVL or PVL using a License Plate where the License Plate Type was provided and the transaction did not contain the License Plate Type, the transaction may be rejected using this code. C – Tag/License plate not on file. Cannot be resubmitted. If the transaction data is matched to the TVL or PVL using a License Plate where the License Plate Type was provided and the transaction did not contain the License Plate Type, the transaction may be rejected using this code. O – Transaction too old. Cannot be resubmitted.</p>
Posted Discount Plan	Char	12	Optional	<p>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.</p> <p>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 NIOIP.</p>

Reconciliation Data Detail Record				
Field	Type	Max Length	Required/ Optional	Comment
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. For the "P" (Posted) reconciliation in response to an "I" (Ignore) Correction Reason in the Adjustment/Correction Data, the Posted Amount shall be a negative value.
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. The Home Hub or Home Agency shall calculate the fees for each Posted (accepted) transaction. Note: Fees may not be applied to transaction adjustments.
Transaction Percent Fee	Num	9	Required	Percent Fee in cents. The Home Hub or Home Agency shall calculate the fees for each Posted (accepted) transaction. Note: Fees may not be applied to transaction adjustments.
Duplicate Transaction Reference ID	Char	20	Optional	If the Posting Disposition is "D" (Duplicate), the Home Agency may use this field to reference the transaction that the Home Agency determined to be the duplicate of the transaction. This field is not required to be populated when the Posting Disposition is "D". If this Transaction Reference ID is provided, and the Away Agency determines the transaction is not a duplicate, it may be resubmitted.
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.

6.8 XML Definition



ReconciliationData_
01192023.xml

6.9 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/license 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.

6.10 Sample Submission



ReconciliationData
Sample_10112016.xr

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 and PVL 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 acknowledgment 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 a PVL:

Example: 9001_9001_9002_9002_20171201001015_00_BPVL.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. 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. 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. This value together with the field above uniquely identifies the original submission.
NIOP Hub ID	Char	4	Required	As Applicable: The ID assigned to the "To" Hub when transmitting Acknowledgement Data from the "From" Agency to the "To" Hub. The ID assigned to the "From" Hub when transmitting Acknowledgement Data from the "From" Hub to the "To" Hub. The ID assigned to the "From" Hub when transmitting Acknowledgement Data from the "From" Hub to the "To" Agency. Refer to NIOP Appendix A for valid values. Note: The NIOPHubID in the XML Definition is SSIOPHubID.
From Agency ID	Char	4	Required	The Agency/Hub generating the acknowledgement. Refer to NIOP Appendix A and B for valid values.
To Agency ID	Char	4	Required	The Agency/Hub that originated the file or submission being acknowledged. Refer to NIOP 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	<p>A code indicating the status of the submission being acknowledged.</p> <p>Values:</p> <p>00 – Submission was successfully received and verified. Submission is accepted and processed.</p> <p>01 – Header record count does not match the number of detail records found in the submission. Entire submission is rejected.</p> <p>02 – Detail record(s) found with invalid data. Remainder of submission was processed. Submission is partially accepted and processed.</p> <p>03 – Sanity check failure. (Bulk TVL or PVL - Sanity checks failed. Differential TVL or PVL – Bulk Identifier was invalid.) Submission is rejected and not processed.</p> <p>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.</p> <p>05 – Duplicate submission sequence number. The entire submission is rejected and not processed.</p> <p>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.</p> <p>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.</p> <p>11 – Reconciliation calculations are incorrect (toll amounts and fees may have a calculation error). (ACK to a Reconciliation Data) Submission is accepted and processed.</p> <p>12 – File received late. This is used when a TVL, PVL or Reconciliation Data is received after the allotted time. For TVLs and PVLs the previous TVL or PVL will be used. The entire submission is rejected and not processed.</p> <p>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.</p>

7.5 XML Definition



Acknowledgement_
04042023.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



AcknowledgementS
ample.xml

Appendix A: NIOP Hub IDs

The NIOP Hubs are assigned a numeric ID value. These values are listed in [NIOP ICD Appendix A – RELEASED YYYYMMDD.xlsx](#).

Appendix B: NIOP Agency IDs

The agencies participating in National Interoperability are assigned unique Agency IDs. The NIOP Agency IDs listed in [NIOP ICD Appendix B – Last Update RELEASED.xlsx](#) 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 [NIOP ICD Appendix C – RELEASED YYYYMMDD.xlsx](#) 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 [NIOP ICD Appendix C – RELEASED YYYYMMDD.xlsx](#) 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 [NIOP ICD Appendix D – RELEASED YYYYMMDD.xlsx](#).

Appendix E: License Plate Types

The defined License Plate Types are included in this section.

The content of this section is located in [NIOP ICD Appendix E – RELEASED YYYYMMDD.xlsx](#).

Appendix F: State Codes

The defined State Codes are included in this section.

The content of this section is located in [NIOP ICD Appendix F – RELEASED YYYYMMDD.xlsx](#).