RICHMOND METROPOLITAN TRANSPORTATION AUTHORITY

RFP # ETC – 2021
ELECTRONIC TOLL COLLECTION SYSTEM & SERVICES
ADDENDUM 5

October 13, 2021

The Richmond Metropolitan Transportation Authority (the "Authority") hereby issues this Addendum Number 5 to its Request for Proposals (RFP # ETC - 2021) For Electronic Toll System and Services dated October 8, 2021 (as supplemented by previous Addenda, the "RFP"). Except as set forth herein, all other terms, provisions and conditions of the RFP and the attachments and exhibits thereto, including all Addenda previously issued, shall remain unchanged. The information contained in this Addendum and the documents attached hereto shall become a part of the RFP and, to the extent specified, shall supplement, revise and supersede the similar information and documents in the RFP and take precedence over the original portion of the RFP, as heretofore supplemented.

Each Proposer shall acknowledge receipt of this addendum when submitting their Proposal using the Acknowledgement of Addenda form provided in Appendix H: Proposal Forms, of the RFP package (Appendix H, page # 2).

CHANGES TO THE AUTHORITY'S REQUEST FOR PROPOSALS (RFP):

This addendum appends:

1) Violation Interface Specifications Version 2.1 to Appendix K. VDOT ICDs as provided as an attachment to this addendum.

Violation Interface

Virginia Toll Facilities Group – VDOT

Specifications

Version 2.1

Feb 5, 2021

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Revision Status

Date	Version Number	Responsible Party	Comments
3/1/2011	V1.0 – DRAFT	Federal Signal Technologies	Initial Draft
3/2/2011	V1.1 – DRAFT	Federal Signal Technologies	Initial Review comments incorporated
9/16/2011	V1.2 – FINAL	FSTech	Final Version
12/12/2011	V1.3 – FINAL	FSTech	Added Image Type (F = Front, R = Rear, I = Region of Interest) to Image File Name
3/6/2013	V1.4 – DRAFT	3M	Changed Facility Name to Mandatory and updated Appendix F with new roadways
9/21/2016	V1.5 – DRAFT	Faneuil	OCR level 101 for transactions reviewed before sending the transactions
9/29/2016	V1.6 – DRAFT	Faneuil	Added clarification on violation images sent
4/17/2017	V1.7 – FINAL	Faneuil	Added zipping option for the violation file and images, PGP encryption changed to optional
2/15/2018	V.1.8 – FINAL	VDOT	Added indication of what image will be selected on the Violation Document. Removed PGP encryption of image files.
8/15/2018	V.1.9 – FINAL	VDOT	Added OU Codes
2/5/2021	V.2.1	VDOT	Changed connection to ftps, clarified image

			transmission, added Home Agency ID, updated Plaza appendix, update Lane appendix, update facility appendix Added ability to send both video toll and ETC rates for a transaction to support future Pay-by-Plate Removed unused ProcessingRequest field

1 Introduction

The *Violation Interface – VTFG to VDOT - Specifications* document defines the formats for the files that shall be transmitted between the VTFG agencies and the VDOT Customer Service Center (CSC) to facilitate the processing of violations.

The interface files defined are:

File Name	File Usage
Violation Transaction File	Created by the VTFG agency to inform the CSC of all violation transactions that require processing at the CSC.
Violation Disposition File	Created by the CSC to inform the VTFG agency as to the disposition of violation transactions processed by the CSC that occurred at the VTFG agency's facilities.
Image File	Created by the VTFG agency to transmit the violation images to the CSC in support of the violation transactions provided in the violation transaction file (see above).

2 Violation Transaction File

2.1 Violation Transaction File Content

The following detail fields are included in Image File:

Unique sequence ID
Transaction Type
Entry Plaza Id
Entry Lane Id
Entry Date/Time
Entry Lane Sequence Number
Entry Lane Mode
Exit Plaza Id
Exit Lane Id
Exit Date/Time
Exit Lane Sequence Number
Exit Lane Mode
Image Available Flag
Number of Images for Transaction
Tag Serial Number
Home Agency
Tag Agency
Tag Status
Tag Class
License Plate Number
License State
License Plate Type
OCR Confidence for Plate Number
OCR Confidence for Plate State
OCR Confidence for Plate Type
PreClass Forward Axle Count
PreClass Reverse Axle Count
Forward Axle Count
Reverse Axle Count
Vehicle Classification
Unusual Occurrence Code
Expected Revenue
Video Amount Due
Collected Revenue

2.2 Violation Transaction File Naming

The Violation Transaction File is named according to the following convention:

X[FacilityID]_[FileDateTime]_VTX.XML
X – Is the Violation Transaction File
FacilityID – Is the Facility ID
FileDateTime – Is the FileDateTime
VTX – Is the Violation Transaction file.

Example: For a Violation Transaction File created by Facility 002 at 00:43:21 on November 31, 2006, the name of the file would be X002_20061131004321_VTX.XML.

2.3 Violation Transaction File Layout

Violation Transaction File uses XML formatting as defined below.

```
<VTXFile_1.0>
        <Header          FacilityID=""
                         FacilityName=""
```

```
                    FileDateTime=""
                    TransactionCount=""
                    TransactionSum="" />
        <DetailData>
            <VTX            UniqueSequenceNo=""
                            TransactionType=""
                            EntryPlazaID=""
                            EntryLaneID= “”
                            EntryDateTime=""
                            EntryLaneSeqNo=""
                            EntryLaneMode=""
                            ExitPlazaID=""
                            ExitLaneID= “”
                            ExitDateTime=""
                            ExitLaneSeqNo=""
                            ExitLaneMode=""
                            ImageAvailable=""
                            NumberofImages=""
                            TagSerialNumber=""
                            HomeAgency=""
                            TagAgency=""
                            TagStatus=""
                            TagClass=""
                            LicensePlateNumber=""
                            LicensePlateState=""
                            LicensePlateType=""
                            OCRConfPlateNum=""
                            OCRConfPlateState-“”
                            OCRConfPlateType=""
                            FareAxle=""
                            VehicleClass=’’
                            UOCode=""
                            ExpectedRevenue=""
                            VideoAmountDue=""
                            CollectedRevenue="" />
        …
        </DetailData>
        <Footer />
</VTXFile_1.0>
```

2.4 Violation Transaction File Data Elements

2.4.1 Top Level (Root) Tag

The file description used in the top-level xml tag will be <VTXFile_1.0> .

2.4.2 Header

Each file will contain a header record containing data applicable to all detailed records and providing summary data to be used to verify file integrity. Listed in Table 2-1 are the data elements for the <Header> record in a Violation Transaction File.

Table 2-1 Data Elements for the <HEADER> Record

DATA ELEMENT NAME	MANDATORY	XML DATA TYPE	COMMENTS
FacilityID	Yes	Int	Facility ID providing this data file. . Match to the number used by the VDOT CSC
FacilityName	Yes	Char(50)	Name of facility. Match to the name as used in the VDOT CSC
FileDateTime	Yes	Char(19)	Date/Time this file was created. Formatted as YYYY-MM-DD HH:MM:SS

DATA ELEMENT NAME	MANDATORY	XML DATA TYPE	COMMENTS
TransactionCount	Yes	Int	Number of Transaction records in the file.
TransactionSum	Yes	Decimal	Total summation (of Expected Revenue) of all Transaction records in this file.

2.4.3 Detail Data

Each transaction record will be contained within a <VTX> record. Listed in Table 2-2 are the data elements for the <VTX> record.

Table 2-2 Data Elements for the <VTX> Record

DATA ELEMENT NAME	MANDATORY	XML DATA TYPE	COMMENTS
UniqueSequenceNo	Yes	Bigint	Unique sequence number of this transaction. This is assigned by the sending agency.
TransactionType	Yes	Char(1)	Type of Transaction B – Barrier C – Entry/Exit X – Unmatched Exit (Entry/Exit System)
EntryPlazaID	Yes	Smallint	Entry Plaza Id of this transaction. Use * if Barrier or Unmatched Exit Must match Plaza ID used by VDOT CSC
EntryLaneID	Yes	Tinyint	Entry Lane Id of this transaction. Use * if Barrier or Unmatched Exit Must match Lane ID used by VDOT CSC
EntryDateTime	Yes	Char(19)	Entry Date and Time of this transaction. Use * if Barrier or Unmatched Exit Formatted as YYYY-MM-DD HH:MM:SS
EntryLaneSeqNo	Yes	Int	Entry Lane Sequence Number of this transaction Use 0 if Barrier or Unmatched Exit or is

DATA ELEMENT NAME	MANDATORY	XML DATA TYPE	COMMENTS
			not used by Toll Facility System
EntryLaneMode	Yes	Smallint	Entry Lane Mode of this transaction Use * if Barrier or Unmatched Exit Must match Lane Mode types used by VDOT CSC
ExitPlazaID	Yes	Smallint	Exit Plaza Id of this transaction. Must match Plaza ID used by VDOT CSC
ExitLaneID	Yes	Tinyint	Exit Lane Id of this transaction. Must match Lane ID used by VDOT CSC
ExitDateTime	Yes	Char(19)	Exit Date and Time of this transaction Formatted as YYYY-MM-DD HH:MM:SS
ExitLaneSeqNo	Yes	Int	Exit Lane Sequence Number of this transaction This is the Lane Sequence Number used to label the violation image files
ExitLaneMode	Yes	Tinyint	Exit Lane Mode of this transaction Must match Lane Mode types used by VDOT CSC
ImageAvailable	Yes	Char(1)	Y if image is available from sending agency; N if image is not available from sending agency
NumberofImages	Yes	Tinyint	Number of Images to be sent with this violation
TagSerialNumber	No	Bigint	Tag Number of this transaction. Use * if no tag number is available (Max 10 characters)
TagAgency	No	Int	Tag Agency ID of this transaction.

DATA ELEMENT NAME	MANDATORY	XML DATA TYPE	COMMENTS
			Use * if no tag agency is available (Max value 9999)
HomeAgency	No	Int	Home Agency ID from IAG v.1.6 spec. of Transponder (Max value 9999)
TagProtocol	No	Char(3)	The tag protocol that was used to determine the TagID, if available or the protocols supported by the transponder, if available. Values: T – TDM S – SeGo 6 – 6C TS – TDM/SeGo T6 – TDM/6C S6 – SeGo/6C TS6 – TDM/SeGo/6C *** – Not Available
TagStatus	No	Char(10)	Tag status, as known by the lane/plaza at this time of the transaction Use * if no tag status is available
TagClass	No	Smallint	Tag class read at the time of this transaction Use * if no tag class is available
LicensePlateNumber	Yes	Char(10)	License Plate Number of this transaction (left justified) Use * if no plate number is available
LicensePlateState	Yes	Char(2)	License Plate State of this transaction. Use * if no plate state is available
LicensePlateType	Yes	Char(30)	License Plate Type of this transaction Use * if no plate type is available Must match the License Plate Type used by the VDOT CSC (see Appendix A)

DATA ELEMENT NAME	MANDATORY	XML DATA TYPE	COMMENTS
OCRConfPlateNum	Yes	Smallint	OCR Confidence Level of License Plate Number 00 to 101 Use 0 if not available For roadways doing image review before sending them to the CSC, use value 101
OCRConfPlateState	Yes	Smallint	OCR Confidence Level of License Plate State 00 to 101 Use 0 if not available For roadways doing image review before sending them to the CSC, use value 101
OCRConfPlateType	Yes	Smallint	OCR Confidence Level of License Plate Type 00 to 101 Use 0 if not available For roadways doing image review before sending them to the CSC, use value 101
FareAxle	No	Tinyint	Forward Axle count
VehicleClass	Yes	Tinyint	Vehicle Classification from lane/plaza processing. Based on lane sensors, tag class, collector input, etc. according to business rules specific to the facility.
UOCode	Yes	Smallint	Unusual Occurrence Code Must match code used by the VDOT CSC (see Appendix B)
ExpectedRevenue	Yes	Decimal	Transaction Amount in dollars to be Collected (e.g: 0.70) – Expected revenue for violation transaction – should be the VToll/ETC rate if a VideoAmountDue field is sent

DATA ELEMENT NAME	MANDATORY	XML DATA TYPE	COMMENTS
VideoAmountDue	No	Decimal	Expected toll due if transaction is processed as a video or Pay-by-Plate transaction
CollectedRevenue	Yes	Decimal	Any amount in dollars that may have already been collected on this transaction (i.e. partial pay)

2.4.4 Footer

Each file will contain a footer record with no required data elements.

3 Violation Initial Disposition File

3.1 Violation Initial Disposition File Content

The following detail fields are included in Violation Initial Disposition File:

Unique sequence ID
TransSeqID
Posting Date
Initial Disposition status

3.2 Violation Disposition File Naming

The Violation Disposition File is named according to the following convention:.

D[FacilityID]_[FileDateTime]_VDF.XML
D – Is the Violation Initial Disposition File
FacilityID – Is the Facility ID of the original transaction file
FileDateTime – Is the FileDateTime of the original transaction file
VDF – Is the violation initial disposition file.

Example: For a Violation Initial Disposition File created to respond to Facility 002 at 00:43:21 on November 31, 2006, the name of the file would be D002_20061131004321_VDF.XML.

3.3 Violation Initial Disposition File Layout

Violation Initial Disposition File uses XML formatting as defined below.

```
<ViolationDispositionFile_1.0>
        <Header          FacilityID=""
                         FacilityName=""
                         FileDateTime=""
                         TransactionCount="" />
        <DetailData>
                <ViolationDisposition        UniqueSequenceNo=""
                                             TransSeqID=""
                                             PostingDate=''
                                             InitialDispositionStatus="" />
        …
        </DetailData>
        <Footer />
</ViolationDispositionFile_1.0>
```

3.4 Violation Initial Disposition File Data Elements

3.4.1 Top Level (Root) Tag

The file description used in the top-level xml tag will be <ViolationDispositionFile_1.0> .

3.4.2 Header

Each file will contain a header record containing data applicable to all detailed records and providing summary data to be used to verify file integrity. Listed in Table 3-1 are the data elements for the <Header> record in a Violation Initial Disposition File.

Table 3-1 Data Elements for the <HEADER> Record

DATA ELEMENT NAME	MANDATORY	XML DATA TYPE	COMMENTS
FacilityID	Yes	Smallint	Facility ID from the original Transaction File. Match to the number used by the VDOT CSC (see Appendix D)

DATA ELEMENT NAME	MANDATORY	XML DATA TYPE	COMMENTS
FacilityName	No	Char(50)	Name of facility to which dispositions will be sent. Match to the name as used in the VDOT CSC (see Appendix D)
FileDateTime	Yes	DateTime	Date/Time of this file. Formatted as YYYY-MM-DD HH:MM:SS
TransactionCount	Yes	Int	Number of Transaction records in the file.

3.4.3 Detail Data

Each transaction record will be contained within a <ViolationDisposition> record. Listed in Table 3-2 are the data elements for the <ViolationDisposition> record.

Table 3-2 Data Elements for the <VIOLATIONDISPOSITION> Record

DATA ELEMENT NAME	MANDATORY	XML DATA TYPE	COMMENTS
UniqueSequenceNo	Yes	Int	Unique sequence number of this transaction. This is assigned by the sending agency.
TransSeqID	Yes	Int	TransactionSeqID assigned by the CSC.
PostingDate	Yes	Int	TransPostingDate assigned by the CSC. Formatted as YYYYMMDD
InitialDispositionStatus	Yes	Char(1)	V – violation transaction accepted for processing. T – invalid date/time (in the future) P – Invalid Plaza and/or Lane D – Duplicate U – Invalid UO Code X – Reject (other reason) Z – Zero Dollar Expected Revenue

3.4.4 Footer

Each file will contain a footer record with no required data elements.

4 Image File

4.1 Image File

All images shall be labeled to match the Facility ID, Exit Plaza, Exit Lane, ExitDateTime and the Exit Lane Sequence Number provided in the violation transaction. Only one set of images from the referenced plaza location shall be transmitted.

All images will be in JPEG format.

4.2 Image File Naming

The Image File is named according to the following convention (before encryption):.

I[FacilityID]_[Plaza]_[Lane]_[ExitDateTime]_[LaneSeqNo]_[ImageType]_[ImageNo].JPG
I – Is the Image File
FacilityID – Is the Facility ID
Plaza – is the Exit Plaza ID
Lane – is the Exit Lane ID
ExitDateTime – Is the Exit Date and Time of the Violation Transaction
LaneSeqNo –Exit Lane Sequence Number of the Violation Transaction
ImageType – F for Front, R for Rear, I for ROI (Region of Interest), V – Violation Document
JPG – Is the JPEG Image file.

Example: For a Image File created by Facility 002 at 00:43:21 on November 31, 2006 for Plaza 1, Lane 12, Lane Sequence No 1000, Image 2 in sequence and a Front Camera, the name of the file would be I002_!_12_20061131004321_1000_R_2.JPG. Image marked as **V** will be selected to be displayed on the Violation Document produced by the CSC, this designation shall be used if the toll facility performs its own image review.

5 General File Requirements

1) All transaction files (violation transactions and violation initial disposition) shall be compressed (ZIPped) using a standard Lempel-Zif compression algorithm which should yield a compression rate of at least 75% (meaning a file will be reduced so that it is only 25% of its original size). NO passwords should be used on the files.
2) When compressed, 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. Therefore, when file "X002_20061131004321_VTX.XML" is compressed, the compressed file shall be named "X002_20061131004321_VTX_XML.ZIP".
3) Files will be fully created and zipped before being made available on an FTPS server.
4) The FTPS account space for each agency using this service is divided into 'IN' and 'OUT' subdirectories.
5) All files being delivered by the using Agency will be dropped off into the 'IN' subdirectory.
6) When transferring the .ZIP files to the FTPS server, rename the extension from .ZIP to .ZAP before transferring the file. Then transfer the file to the FTPS site. The .ZAP extension tells the receiving code that a file transfer is in progress and do not process this file.
7) When the file transfer has been completed, change the file extension back to .ZIP for the file just delivered to the FTPS server. This lets the receiving code know that the file can now be processed.
8) The process described in 6) and 7) are also used by the CSC when delivering response files to the 'OUT' subdirectory. Never pick up a file with the .ZAP extension.
9) If a file has been delivered to the 'IN' subdirectory, and the receiving code determines that there is a problem between the header data and the contents of the file, the original file will have a .bad extension added to it, and will then be placed in the 'OUT' subdirectory.
10) The CSC receiving code will be responsible for keeping the 'IN' subdirectory cleaned out of all processed files.
11) The using Agency is responsible for cleaning out the 'OUT' subdirectory after receiving the response and .bad files.
12) The images and the XML transaction file shall be transferred all together and zipped into a single transaction file. This file must include all the images associated with the XML file. The file will be named per general file requirements, point 2 and transferred and renamed afterwards per requirement point 6.
13) The connection made to the FTPS server is made with FTP with TLS/SSL Explicit Encryption to host ftps.ezpassva.com (ftps-uat.ezpassva.com for testing) over port 21. The communication will be secured on the transport layer via *.ezpassva.com publicly valid certificate. The FTPS server will have a white-list of ip addresses which it will accept connections from, each roadway is required to provide a list of IP addresses.

7 Appendix A – License Plate Type

Contact the E-ZPassVA CSC Service center to get the latest license plate type.

8 Appendix B – Unusual Occurrence (UO) Code

UnusualOccuranceCodeID	UnusualOccuranceCodeDesc
0	No Unusual Occurrence
1	Auth Run Thru
2	Run Thru
3	Under Class
4	Axle Mismatch
5	Verify AVI Tag
6	Invalid AVI Tag
7	Stolen AVI Tag
8	Bad AIV Read
9	Under Payment
10	Operator Init VES
11	Audit VES
12	Over Classification
13	Over Payment
14	Reclassification
15	Reverse Run Thru
16	Backup
17	Lane Update
18	Lane Resync
19	Maint Test
20	Class Mismatch
21	Unpaid Purged VSR no axles no revenue
22	EARLY READ
23	NOFUNDS TAG
25	Non Revenue
29	Late AVI Read

9 Appendix D – Facility ID and Facility Name

FacilityID	FacilityName	FacilityShortName
1	DULLES GREENWAY	GW
2	DULLES TOLL ROAD	DTR
3	COLEMAN BRIDGE	CB
4	POWHITE PARKWAY	PW
5	RMA	RMA
6	CHESAPEAKE EXPRESSWAY	CE
7	POCAHONTAS PARKWAY	POCA
8	CHESAPEAKE BAY BRIDGE TUNNEL	CBBT
9	SOUTH NORFOLK JORDAN BRIDGE	SNJB
10	495 EXPRESS LANES	X495
11	ELIZABETH RIVER CROSSINGS	ERC
12	95 395 EXPRESS LANES	X95
13	DOMINION BOULEVARD	DOM
14	I66 INSIDE BELTWAY	I66IB
15	I-64 EXPRESS	64X