Regular Meeting of the Board of Directors

9:00 a.m.
Wednesday, June 29, 2022

Lowell H. Lebermann, Jr., Board Room
3300 N. IH-35, Suite 300
Austin, Texas 78705

A live video stream of this meeting may be viewed on the internet at
www.mobilityauthority.com

Note to members of the public. Pursuant to Texas Transportation Code Section 370.262, this meeting will be held by telephone conference call. Some Board Members may be present in the Lebermann Board Room while others may participate remotely. In order to maintain safe social distancing, you may view the Board Meeting online via the live stream link on our website**.** Members of the public that wish to join the conference call to provide comments to the Board remotely must register at least 30 minutes prior to the scheduled start time by contacting the Central Texas Regional Mobility Authority at (844) 287-6220.

Persons with disabilities. If you plan to attend this meeting and may need auxiliary aids or services, such as an interpreter for those who are deaf or hearing impaired, or if you are a reader of large print or Braille, please contact Laura Bohl at (512) 996-9778 at least two days before the meeting so that appropriate arrangements can be made.

Español. Si desea recibir asistencia gratuita para traducir esta información, llame al (512) 996-9778.

AGENDA

No action on the following:

1.   Welcome and opportunity for public comment – See *Notes* at the end of this agenda.

Consent Agenda

*See **Notes** at the end of this agenda.*

2.   Approve the minutes from the May 25, 2022 Regular Board Meeting.

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3.   Prohibit the operation of certain vehicles on Mobility Authority toll facilities pursuant to the Habitual Violator Program.

Regular Items

Items to discuss, consider, and take appropriate action.

4.   Accept the financial statements for May 2022.

5.   Discuss and adopt the FY 2023 Operating Budget.

6.   Discuss and consider approving Amendment No. 2 to the agreement with Deloitte Consulting, LLP for continued development of the data platform and associated transaction routing and system interfaces to support toll transaction management.

7.   Discuss and consider approving an agreement with Deloitte Consulting, LLP for toll operations and maintenance services related to the Mobility Authority's Data Platform Project.

8.   Discuss and consider approving Amendment No. 2 to the Kapsch Restated Maintenance Agreement for the incorporation of updated key performance indicators and clarification of maintenance pricing for Intelligent Transportation System services.

9.   Discuss and consider approving agreements with the Travis County Sheriff's Office for habitual violator road enforcement services.

Briefings and Reports

Items for briefing and discussion only. No action will be taken by the Board.

10.   Executive Director Report.

    A. Agency performance metrics.

        (i)   Roadway performance
        (ii)   Call-Center performance

Executive Session

Under Chapter 551 of the Texas Government Code, the Board may recess into a closed meeting (an executive session) to deliberate any item on this agenda if the Chairman announces the item will be deliberated in executive session and identifies the section or sections of Chapter 551 that authorize meeting in executive session. A final action, decision, or vote on a matter deliberated in executive session will be made only after the Board reconvenes in an open meeting.

The Board may deliberate the following items in executive session if announced by the Chairman:

11. Discuss legal issues related to claims by or against the Mobility Authority; pending or contemplated litigation and any related settlement offers; or other matters as authorized by §551.071 (Consultation with Attorney).

12. Discuss legal issues relating to procurement and financing of Mobility Authority transportation projects and toll system improvements, as authorized by §551.071 (Consultation with Attorney).

13. Discuss personnel matters as authorized by §551.074 (Personnel Matters).

Reconvene in Open Session.

Regular Items

Items to discuss, consider, and take appropriate action.

14. Adjourn Meeting.

Notes

Opportunity for Public Comment. At the beginning of the meeting, the Board provides a period of up to one hour for public comment on any matter subject to the Mobility Authority's jurisdiction. Each speaker is allowed a maximum of three minutes. A person who wishes to address the Board must register in advance and provide the speaker's name, address, phone number and email, as well as the agenda item number and whether you wish to speak during the public comment period or during the agenda item. If a speaker's topic is not listed on this agenda, the Board may not deliberate the speaker's topic or question the speaker during the open comment period, but may direct staff to investigate the matter or propose that an item be placed on a subsequent agenda for deliberation and possible action by the Board. The Board may not deliberate or act on an item that is not listed on this agenda.

Consent Agenda. The Consent Agenda includes routine or recurring items for Board action with a single vote. The Chairman or any Board Member may defer action on a Consent Agenda item for discussion and consideration by the Board with the other Regular Items.

Public Comment on Agenda Items. A member of the public may offer comments on a specific agenda item in open session if he or she signs the speaker registration sheet for that item before the Board takes up consideration of the item. The Chairman may limit the amount of time allowed for each speaker. Public comment unrelated to a specific agenda item must be offered during the open comment period.

Meeting Procedures. The order and numbering of agenda items is for ease of reference only. After the meeting is convened, the Chairman may rearrange the order in which agenda items are considered, and the Board may consider items on the agenda in any order or at any time during the meeting.

Participation by Telephone Conference Call. One or more members of the Board of Directors may participate in this meeting through a telephone conference call, as authorized by Sec. 370.262, Texas Transportation Code (*see below*). Under that law, each part of the telephone conference call meeting that by law must be open to the public, shall be audible to the public at the meeting location, and will be tape-recorded or documented by written minutes. On conclusion of the meeting, the tape recording or the written minutes of the meeting will be made available to the public.

> Sec. 370.262. MEETINGS BY TELEPHONE CONFERENCE CALL.
> (a) Chapter 551, Government Code, does not prohibit any open or closed meeting of the board, a committee of the board, or the staff, or any combination of the board or staff, from being held by telephone conference call. The board may hold an open or closed meeting by

telephone conference call subject to the requirements of Sections 551.125(c)-(f), Government Code, but is not subject to the requirements of Subsection (b) of that section.

(b) A telephone conference call meeting is subject to the notice requirements applicable to other meetings.

(c) Notice of a telephone conference call meeting that by law must be open to the public must specify the location of the meeting. The location must be a conference room of the authority or other facility in a county of the authority that is accessible to the public.

(d) Each part of the telephone conference call meeting that by law must be open to the public shall be audible to the public at the location specified in the notice and shall be tape-recorded or documented by written minutes. On conclusion of the meeting, the tape recording or the written minutes of the meeting shall be made available to the public.

Sec. 551.125. OTHER GOVERNMENTAL BODY. (a) Except as otherwise provided by this subchapter, this chapter does not prohibit a governmental body from holding an open or closed meeting by telephone conference call.

(b) A meeting held by telephone conference call may be held only if:
(1) an emergency or public necessity exists within the meaning of Section 551.045 of this chapter; and
(2) the convening at one location of a quorum of the governmental body is difficult or impossible; or
(3) the meeting is held by an advisory board.

(c) The telephone conference call meeting is subject to the notice requirements applicable to other meetings.

(d) The notice of the telephone conference call meeting must specify as the location of the meeting the location where meetings of the governmental body are usually held.

(e) Each part of the telephone conference call meeting that is required to be open to the public shall be audible to the public at the location specified in the notice of the meeting as the location of the meeting and shall be tape-recorded. The tape recording shall be made available to the public.

(f) The location designated in the notice as the location of the meeting shall provide two-way communication during the entire telephone conference call meeting and the identification of each party to the telephone conference shall be clearly stated prior to speaking.

Welcome and opportunity for public comment.
No Board action required.

CENTRAL TEXAS REGIONAL MOBILITY AUTHORITY

Strategic Plan Relevance: Regional Mobility

Department: Legal

Contact: Geoff Petrov, General Counsel

Associated Costs: N/A

Funding Source: N/A

Action Requested: Consider and act on motion to approve minutes

Description/Background: Approve the attached draft minutes for the May 25, 2022, Regular Board Meeting.

Backup provided: Draft minutes

MINUTES

Regular Meeting of the Board of

Directors of the

CENTRAL TEXAS REGIONAL MOBILITY AUTHORITY

Wednesday, May 25, 2022

9:00 a.m.

This was an in person and telephone conference call meeting. Notice of the meeting was posted May 20, 2022 online on the website of the Mobility Authority and in the Mobility Authority's office lobby at 3300 N. Interstate 35, #300, Austin, Texas 78705-1849. Chairman Robert Jenkins and Board Members David Singleton, Heather Gaddes and Nikelle Meade* were present in the Lebermann Board Room. Board Member David Armbrust and Jay Blazek Crossley participated on the telephone conference call.

**An archived copy of the live-streamed audio of this
meeting is available at:**

https://mobilityauthority.swagit.com/play/05252022-831

After noting that a quorum of the Board was present, Chairman Jenkins called the meeting to order at 9:02 a.m. and had each Board Member who called in state their name for the record and confirm that they could both hear and be heard by all other attendees that were present in-person or on the phone.

1. Welcome and opportunity for public comment.

   Sharon Blythe, Director, Rescue Austin Memorial Park Cemetery provided public comment.

   Consent Agenda

2. Approve the minutes from the April 25, 2022 Regular Board Meeting.

3. Prohibit the operation of certain vehicles on Mobility Authority toll facilities pursuant to the Habitual Violator Program.

   ADOPTED AS: **RESOLUTION NO. 22-023**

   MOTION: Approve Item Nos. 2 and 3.

RESULT:	Approved (Unanimous); 5-0
MOTION:	David Singleton
SECONDED BY:	Heather Gaddes
AYE:	Armbrust, Crossley, Gaddes, Jenkins, Singleton
NAY:	None.

Regular Items

4. Accept the financial statements for April 2022.

    Presentation by Jose Hernandez, Chief Financial Officer and Mary Temple, Controller.

MOTION:	Accept the financial statements for April 2022.
RESULT:	Approved (Unanimous); 5-0
MOTION:	Heather Gaddes
SECONDED BY:	David Singleton
AYE:	Armbrust, Crossley, Gaddes, Jenkins, Singleton
NAY:	None.

ADOPTED AS:	**RESOLUTION NO. 22-024**

Briefings and Reports

5. Executive Director Report.

    Presentation by James M. Bass, Executive Director.

    A. Agency performance metrics.

        (i)   Roadway performance
        (ii)   Call Center performance

Executive Session

Chairman Jenkins announced in open session at 9:24 a.m. that the Board would recess the meeting and reconvene in Executive Session to deliberate the following items:

6. Discuss legal issues related to claims by or against the Mobility Authority; pending or contemplated litigation and any related settlement offers; or other matters as authorized by §551.071 (Consultation with Attorney).

7. Discuss legal issues relating to procurement and financing of Mobility Authority transportation projects and toll system improvements, as authorized by §551.071 (Consultation with Attorney).

8. Discuss personnel matters as authorized by §551.074 (Personnel Matters).

    *NOTE: Nikelle Meade joined the Board Meeting during Executive Session at 9:35 a.m.

    After completing the executive session, the Board reconvened in open meeting at 9:53 a.m.

    Briefings and Reports

9. Draft FY 2023 Budget.

    Presentation by James M. Bass, Executive Director.

    After confirming that no member of the public wished to address the Board, Chairman Jenkins declared the meeting adjourned at 10:31 a.m.

10. Adjourn Meeting.

Prohibit the operation of certain vehicles on Mobility Authority toll facilities pursuant to the Habitual Violator Program

Strategic Plan Relevance:	Regional Mobility
Department:	Operations
Contact:	Tracie Brown, Director of Operations
Associated Costs:	N/A
Funding Source:	N/A
Action Requested:	Consider and act on draft resolution

Project Description/Background: The Mobility Authority's habitual violator process prescribes two notices before habitual violator remedies go into effect. A pre-determination letter is sent 60 days before any remedies are enforced advising the customer again of their outstanding balance and providing an opportunity for resolution. Assuming no resolution, a *Notice of Determination* is mailed notifying the customer they've been determined to be a habitual violator and advising of the consequences. The customer is also informed of their right to appeal the decision and the process by which to do so.

If the customer does not contact the Authority to appeal the habitual violator determination or resolve their outstanding balance, a block is placed on the related vehicle's registration preventing renewal. The block remains in effect until all tolls and fees have been paid, a payment plan has been arranged with the Mobility Authority or the customer is determined to no longer be a habitual violator.

Previous Actions & Brief History of the Program/Project: State law provides that persons deemed to be habitual violators may also be prohibited from use of the Mobility Authority's toll facilities by order of the Board of Directors. Habitual violator customers operating a vehicle in violation of a ban are subject to a Class C misdemeanor with a fine up to $500. A second or subsequent occurrence may result in impoundment of the vehicle. Similar to registration blocks, vehicle bans remain in effect until all

outstanding amounts owed to the Authority have been resolved or the customer is no longer deemed a habitual violator.
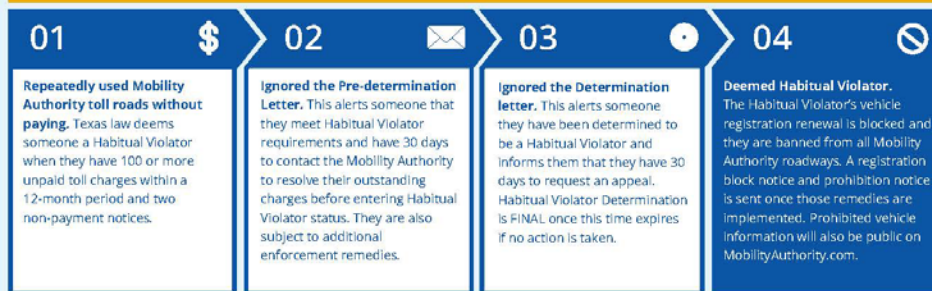
Financing: Not applicable.

Action requested/Staff Recommendation: Staff affirms that all required steps have been followed and proper notice previously provided to customers determined to be habitual violators. To date, these customers have not appealed this determination or resolved their outstanding balances.

Therefore, staff recommends that the Board of Directors approve the order prohibiting certain vehicles from use of the Authority's toll facilities. Following the Board's approval of this order, a Notice of Prohibition will be mailed by first class mail advising of the ban, consequences if the ban is violated and how the customer may resolve their outstanding balance.

Backup provided: Habitual Violator Vehicle Ban FAQs
                        Draft Resolution

Habitual Violator Process

01 $	02 ✉	03 ●	04 ⊘
Repeatedly used Mobility Authority toll roads without paying. Texas law deems someone a Habitual Violator when they have 100 or more unpaid toll charges within a 12-month period and two non-payment notices.	**Ignored the Pre-determination Letter.** This alerts someone that they meet Habitual Violator requirements and have 30 days to contact the Mobility Authority to resolve their outstanding charges before entering Habitual Violator status. They are also subject to additional enforcement remedies.	**Ignored the Determination letter.** This alerts someone they have been determined to be a Habitual Violator and informs them that they have 30 days to request an appeal. Habitual Violator Determination is FINAL once this time expires if no action is taken.	**Deemed Habitual Violator.** The Habitual Violator's vehicle registration renewal is blocked and they are banned from all Mobility Authority roadways. A registration block notice and prohibition notice is sent once those remedies are implemented. Prohibited vehicle information will also be public on MobilityAuthority.com.

Who is a Habitual Violator?

A Habitual Violator is defined in Section 372.106(a) of the Texas Transportation Code as (A) one who was issued at least two written notices of nonpayment that contained in aggregate 100 or more events of nonpayment within a period of one year and, (B) was issued a warning that failure to pay the amounts specified in the notices may result in the toll project entity's exercise of Habitual Violator remedies.

What enforcement remedies is the Mobility Authority implementing for Habitual Violators?

To encourage equitable payment by all customers, legislation allows for enforcement remedies up to and including vehicle registration renewal blocks, prohibiting Habitual Violator's vehicles on Mobility Authority roadways, on-road enforcement of the vehicle ban, as well as posting names to the agency website of those Habitual Violators with banned vehicles. The Mobility Authority will be implementing these remedies beginning November 2019.

How will I know I'm a Habitual Violator subject to enforcement remedies?

Habitual Violators are provided due process protections prior to any enforcement action.

- A registered vehicle owner who the Mobility Authority determines meets the Habitual Violator status is sent a letter advising them that Habitual Violator remedies may be implemented if the customer's outstanding balance is not resolved. This letter is not required by law but is sent as a courtesy to reflect the Mobility Authority's commitment to the customer.

- A registered vehicle owner who the Mobility Authority determines to be a Habitual Violator receives written notice of that determination and an opportunity for a justice of the peace hearing to challenge their Habitual Violator status.

- Habitual Violator Determination is FINAL if no action is taken, prompt in the Mobility Authority

  to send a Vehicle Registration Block Notice and/or a Vehicle Ban Notice. These notices urge the Habitual Violator yet again to resolve their toll debt with the Mobility Authority.

- Sufficient time is provided to respond to all notifications.

Learn more about the Habitual Violator Enforcement Program at MobilityAuthority.com

How can I resolve my Habitual Violator status and settle my toll bill balance?

You can pay outstanding tolls and administrative fees with cash, money order or credit card (a payment plan may be available) by: calling the Mobility Authority Customer Service Center at 512-410-0562, online at **www.paymobilitybill.com**, or in person at our walk-up center.

Why is the Mobility Authority pursuing enforcement remedies?

The vehicle registration block and other toll enforcement actions are intended to encourage tollway drivers to pay for services rendered to ensure fairness to the overwhelming majority of drivers who pay for the service, maintenance and safety of the toll roads.

How will a person be notified that he or she is subject to enforcement remedies?

A notification letter announcing that a person has met the criteria of Habitual Violator is sent to the address in the Texas Department of Motor Vehicles (TTC 372.106) database, allowing 30 days to contact to dispute their determination as a Habitual Violator or address the account balance before remedies are applied. If the Habitual Violator does not make arrangements with the Mobility Authority during this period, they will be subject to all enforcement remedies. Additionally, notification of a registration renewal block is mailed.

Can someone dispute a toll bill?

Yes. You may contact the Mobility Authority to review all outstanding tolls and fees, correct any errors and arrange for payment to clear your status as a Habitual Violator and the block on your registration. Habitual Violators are also given an opportunity to request an administrative hearing with a justice of the peace.

How will I know or be notified that I am subject to a vehicle ban?

Habitual violators subject to vehicle ban will receive notification that they have been banned, including when the ban will take effect and instructions for how to remove their status as a Habitual Violator.

Can I dispute my toll bill that subjects me to the vehicle ban?

Yes. You may contact the Mobility Authority to review all outstanding tolls and administrative fees, correct any errors and arrange for payment to clear your status as a Habitual Violator and remove the vehicle ban.

What happens if I am banned, but get caught driving on a Mobility Authority toll road?

A person commits an offense when operating a vehicle in violation of the ban and is subject to a Class C misdemeanor with a fine up to $500. A second or subsequent occurrence of driving on the tollway in violation of a ban may result in impoundment of the vehicle.

How will the Mobility Authority know if I'm still driving (after being banned)?

Mobility Authority roads are equipped with technology that recognizes vehicle and license plates on our prohibited list. Individuals operating a prohibited vehicle on Mobility Authority roads will be reported to nearby law enforcement patrolling Mobility Authority roads.

Learn more about the Habitual Violator Enforcement Program at MobilityAuthority.com

**GENERAL MEETING OF THE BOARD OF DIRECTORS
OF THE
CENTRAL TEXAS REGIONAL MOBILITY AUTHORITY**

RESOLUTION NO. 22-0XX

**PROHIBITING THE OPERATION OF CERTAIN MOTOR VEHICLES
ON MOBILITY AUTHORITY TOLL FACILITIES PURSUANT TO
THE HABITUAL VIOLATOR PROGRAM**

WHEREAS, Transportation Code, Chapter 372, Subchapter C, authorizes toll project entities, including the Central Texas Regional Mobility Authority (Mobility Authority), to exercise various remedies against certain motorists with unpaid toll violations; and

WHEREAS, Transportation Code §372.106 provides that a "habitual violator" is a registered owner of a vehicle who a toll project entity determines:

> (1) was issued at least two written notices of nonpayment that contained:
>
> > (A) in the aggregate, 100 or more events of nonpayment within a period of one year, not including events of nonpayment for which: (i) the registered owner has provided to the toll project entity information establishing that the vehicle was subject to a lease at the time of nonpayment, as provided by applicable toll project entity law; or (ii) a defense of theft at the time of the nonpayment has been established as provided by applicable toll project entity law; and
> >
> > (B) a warning that the failure to pay the amounts specified in the notices may result in the toll project entity's exercise of habitual violator remedies; and
>
> (2) has not paid in full the total amount due for tolls and administrative fees under those notices; and

WHEREAS, the Central Texas Regional Mobility Authority (Mobility Authority) previously determined that the individuals listed in Exhibit A are habitual violators, and these determinations are now considered final in accordance with Transportation Code, Chapter 372, Subchapter C; and

WHEREAS, Transportation Code §372.109 provides that a final determination that a person is a habitual violator remains in effect until (1) the total amount due for the person's tolls and administrative fees is paid; or (2) the toll project entity, in its sole discretion, determines that the amount has been otherwise addressed; and

WHEREAS, Transportation Code §372.110 provides that a toll project entity, by order of its governing body, may prohibit the operation of a motor vehicle on a toll project of the entity if:
(1) the registered owner of the vehicle has been finally determined to be a habitual violator; and

(2) the toll project entity has provided notice of the prohibition order to the registered owner; and

WHEREAS, the Executive Director recommends that the Board prohibit the operation of the motor vehicles listed in Exhibit A on the Mobility Authority's toll roads, including (1) 183A Toll; (2) 290 Toll; (3) 71 Toll; (4) MoPac Express Lanes; (5) 45SW Toll; and (6) 183 Toll.

NOW THEREFORE, BE IT RESOLVED that the motor vehicles listed in Exhibit A are prohibited from operation on the Mobility Authority's toll roads, effective June 29, 2022; and

BE IT FURTHER RESOLVED that the Mobility Authority shall provide notice of this resolution to the individuals listed in Exhibit A, as required by Transportation Code §372.110; and

BE IT IS FURTHER RESOLVED that the prohibition shall remain in effect for the motor vehicles listed in Exhibit A until the respective habitual violator determinations are terminated, as provided by Transportation Code §372.110.

Adopted by the Board of Directors of the Central Texas Regional Mobility Authority on the 29th day of June 2022.

Submitted and reviewed by: Approved:

_____   _____
James M. Bass   Robert W. Jenkins, Jr.
Executive Director   Chairman, Board of Directors

Exhibit A

LIST OF PROHIBITED VEHICLES

(To be provided at the Board Meeting)

**CENTRAL TEXAS REGIONAL
MOBILITY AUTHORITY**

Strategic Plan Relevance:	Regional Mobility
Department:	Finance
Contact:	José Hernández, Chief Financial Officer
Associated Costs:	N/A
Funding Source:	N/A
Action Requested:	Consider and act on draft resolution

Project Description/Background: Presentation and acceptance of the financial statements for May 2022.

Previous Actions & Brief History of the Program/Project: N/A

Financing: N/A

Action requested/Staff Recommendation: Accept the financial statements for May 2022.

Backup provided: Draft Resolution
Draft financial statements for May 2022

MEETING OF THE BOARD OF DIRECTORS
OF THE
CENTRAL TEXAS REGIONAL MOBILITY AUTHORITY

RESOLUTION NO. 22-0XX

ACCEPT THE FINANCIAL STATEMENTS FOR MAY 2022

WHEREAS, the Central Texas Regional Mobility Authority (Mobility Authority) is empowered to procure such goods and services as it deems necessary to assist with its operations and to study and develop potential transportation projects, and is responsible to insure accurate financial records are maintained using sound and acceptable financial practices; and

WHEREAS, close scrutiny of the Mobility Authority's expenditures for goods and services, including those related to project development, as well as close scrutiny of the Mobility Authority's financial condition and records is the responsibility of the Board and its designees through procedures the Board may implement from time to time; and

WHEREAS, the Board has adopted policies and procedures intended to provide strong fiscal oversight and which authorize the Executive Director, working with the Mobility Authority's Chief Financial Officer, to review invoices, approve disbursements, and prepare and maintain accurate financial records and reports; and

WHEREAS, the Executive Director, working with the Chief Financial Officer, has reviewed and authorized the disbursements necessary for the month of May 2022, and has caused financial statements to be prepared and attached to this resolution as Exhibit A; and

NOW THEREFORE, BE IT RESOLVED, that the Board of Directors accepts the financial statements for May 2022, attached hereto as Exhibit A.

Adopted by the Board of Directors of the Central Texas Regional Mobility Authority on the 29th day of June 2022.

Submitted and reviewed by: Approved:

_____   _____
James M. Bass   Robert W. Jenkins, Jr.
Executive Director   Chairman, Board of Directors

Exhibit A

Central Texas Regional Mobility Authority
Income Statement
For the Period Ending May 31, 2022

	Budget Amount FY 2022	Actual Year to Date	Percent of Budget	Actual Prior Year to Date
REVENUE				
Operating Revenue				
Toll Revenue - Tags	105,220,500	106,653,126	101.36%	73,912,163
Video Tolls	31,433,500	41,600,076	132.34%	21,144,883
Fee Revenue	13,921,000	12,257,692	88.05%	8,862,674
Total Operating Revenue	**150,575,000**	**160,510,895**	**106.60%**	**103,919,721**
Other Revenue				
Interest Income	1,230,764	1,209,171	98.25%	800,582
Grant Revenue	2,180,000	771,650	35.40%	852,471
Misc Revenue	320,000	225,505	70.47%	123,384
Gain/Loss on Sale of Asset	-	20,905	-	-
Total Other Revenue	**3,730,764**	**2,227,231**	**59.70%**	**1,776,436**
TOTAL REVENUE	**$154,305,764**	**$162,738,126**	**105.46%**	**105,696,157**
EXPENSES				
Salaries and Benefits				
Salary Expense-Regular	4,940,743	3,324,746	67.29%	3,814,860
Salary Reserve	80,000	-	-	-
TCDRS	1,016,106	658,676	64.82%	542,975
FICA	238,665	171,944	72.04%	178,408
FICA MED	74,643	49,212	65.93%	58,015
Health Insurance Expense	584,978	353,992	60.51%	421,077
Life Insurance Expense	6,714	5,098	75.92%	8,451
Auto Allowance Expense	10,200	8,925	87.50%	5,525
Other Benefits	209,200	148,420	70.95%	176,515
Unemployment Taxes	5,184	4,362	84.15%	5,021
Total Salaries and Benefits	**7,166,434**	**4,725,376**	**65.94%**	**5,210,847**

Central Texas Regional Mobility Authority
Income Statement
For the Period Ending May 31, 2022

	Budget Amount FY 2022	Actual Year to Date	Percent of Budget	Actual Prior Year to Date
Administrative				
Administrative and Office Expenses				
Accounting	9,000	7,721	85.79%	8,532
Auditing	144,550	110,975	76.77%	91,475
Financial Advisors	-	123,373	-	-
Human Resources	30,000	18,819	62.73%	9,530
Legal	-	66,260	-	-
IT Services	285,000	124,286	43.61%	167,751
Internet	450	-	-	-
Software Licenses	514,500	403,278	78.38%	267,836
Cell Phones	24,800	18,225	73.49%	18,609
Local Telephone Service	105,000	90,426	86.12%	81,643
Overnight Delivery Services	200	74	36.88%	66
Local Delivery Services	50	-	-	12
Copy Machine	16,000	12,720	79.50%	13,992
Repair & Maintenance-General	10,000	2,273	22.73%	4,344
Meeting Facilities	-	1,300	-	-
Meeting Expense	13,250	4,953	37.38%	1,676
Toll Tag Expense	3,000	2,020	67.33%	1,400
Parking / Local Ride Share	2,750	63	2.31%	49
Mileage Reimbursement	4,800	207	4.31%	260
Insurance Expense	651,000	495,665	76.14%	470,757
Rent Expense	575,000	595,192	103.51%	491,374
Building Parking	11,000	1,652	15.02%	251
Legal Services	342,500	216,864	63.32%	240,061
Total Administrative and Office Expenses	**2,742,850**	**2,296,345**	**83.72%**	**1,869,618**
Office Supplies				
Books & Publications	4,250	3,335	78.48%	4,016
Office Supplies	11,000	1,312	11.93%	3,790
Misc Office Equipment	4,500	732	16.28%	6,943
Computer Supplies	186,950	141,850	75.88%	41,120
Copy Supplies	1,500	117	7.80%	93
Other Reports-Printing	5,000	-	-	-
Office Supplies-Printed	5,000	171	3.42%	139
Postage Expense	650	464	71.36%	441
Total Office Supplies	**218,850**	**147,982**	**67.62%**	**56,541**

Central Texas Regional Mobility Authority
Income Statement
For the Period Ending May 31, 2022

	Budget Amount FY 2022	Actual Year to Date	Percent of Budget	Actual Prior Year to Date
Communications and Public Relations				
Graphic Design Services	75,000	-	-	-
Website Maintenance	100,000	53,899	53.90%	32,820
Research Services	275,000	10,109	3.68%	109,616
Communications and Marketing	500,000	15,327	3.07%	119,930
Advertising Expense	800,000	174,813	21.85%	171,764
Direct Mail	85,000	32,500	38.24%	-
Video Production	179,000	16,526	9.23%	15,101
Photography	10,000	424	4.24%	-
Radio	75,000	-	-	-
Other Public Relations	-	-	-	10,576
Promotional Items	10,000	-	-	1,260
Annual Report printing	5,600	780	13.92%	553
Direct Mail Printing	40,000	-	-	770
Other Communication Expenses	15,000	13,900	92.66%	3,062
Total Communications and Public Relations	**2,169,600**	**318,277**	**14.67%**	**465,451**
Employee Development				
Subscriptions	50,560	123	0.24%	1,767
Agency Memberships	57,942	37,320	64.41%	41,106
Continuing Education	11,000	1,729	15.72%	695
Professional Development	14,000	240	1.71%	-
Other Licenses	1,850	554	29.94%	758
Seminars and Conferences	45,500	8,093	17.79%	(6,731)
Travel	89,500	20,832	23.28%	-
Total Employee Development	**270,352**	**68,890**	**25.48%**	**37,595**
Financing and Banking Fees				
Trustee Fees	60,000	53,538	89.23%	58,263
Bank Fee Expense	2,000	3,019	150.97%	1,157
Continuing Disclosure	4,000	6,184	154.59%	3,500
Arbitrage Rebate Calculation	10,000	13,967	139.67%	9,975
Rating Agency Expense	50,000	12,000	24.00%	24,500
Total Financing and Banking Fees	**126,000**	**88,708**	**70.40%**	**97,395**
Total Administrative	**5,527,652**	**2,920,202**	**52.83%**	**2,526,601**

Central Texas Regional Mobility Authority
Income Statement
For the Period Ending May 31, 2022

	Budget Amount FY 2022	Actual Year to Date	Percent of Budget	Actual Prior Year to Date
Operations and Maintenance				
Operations and Maintenance Consulting				
GEC-Trust Indenture Support	521,829	388,110	74.37%	394,051
GEC-Financial Planning Support	243,804	205,769	84.40%	109,708
GEC-Toll Ops Support	1,314,155	708,695	53.93%	220,177
GEC-Roadway Ops Support	1,186,339	797,340	67.21%	635,769
GEC-Technology Support	1,438,856	447,245	31.08%	542,077
GEC-Public Information Support	-	155,051	-	76,544
GEC-General Support	1,473,429	950,817	64.53%	595,967
General System Consultant	1,653,940	1,014,345	61.33%	454,534
Traffic Modeling	67,000	29,015	43.31%	34,142
Traffic and Revenue Consultant	175,000	490,669	280.38%	249,511
Total Operations and Maintenance Consulting	**8,074,352**	**5,187,056**	**64.24%**	**3,312,479**
Roadway Operations and Maintenance				
Roadway Maintenance	4,876,674	4,876,674	100.00%	2,710,485
Landscape Maintenance	1,011,725	1,011,725	100.00%	1,989,650
Signal & Illumination Maint	50,000	-	-	-
Maintenance Supplies-Roadway	350,000	93,118	26.61%	82,930
Tools & Equipment Expense	25,000	138	0.55%	2,383
Gasoline	30,000	11,012	36.71%	10,261
Repair & Maintenance - Vehicles	10,000	4,220	42.20%	5,243
Natural Gas	2,500	4,362	174.49%	2,297
Electricity - Roadways	250,000	168,028	67.21%	163,766
Total Roadway Operations and Maintenance	**6,605,899**	**6,169,277**	**93.39%**	**4,967,015**
Toll Processing and Collection Expense				
Image Processing	3,000,000	3,513,684	117.12%	1,784,506
Tag Collection Fees	6,041,000	8,144,015	134.81%	5,429,820
Court Enforcement Costs	75,000	-	-	-
DMV Lookup Fees	250	-	-	-
Total Processing and Collection Expense	**9,116,250**	**11,657,699**	**127.88%**	**7,214,327**

Central Texas Regional Mobility Authority
Income Statement
For the Period Ending May 31, 2022

	Budget Amount FY 2022	Actual Year to Date	Percent of Budget	Actual Prior Year to Date
Toll Operations Expense				
Generator Fuel	3,000	-	-	1,409
Fire and Burglar Alarm	500	411	82.24%	370
Refuse	2,200	1,635	74.32%	1,610
Water - Irrigation	7,500	4,332	57.76%	3,423
Electricity	500	558	111.65%	636
ETC spare parts expense	50,000	(87,945)	-175.89%	161,341
Repair & Maintenance Toll Equip	75,000	5,197	6.93%	-
Law Enforcement	450,000	383,001	85.11%	182,668
ETC Maintenance Contract	5,390,000	2,622,335	48.65%	2,944,797
ETC Toll Management Center System Operation	642,852	564,932	87.88%	389,616
ETC Development	1,140,000	398,433	34.95%	888,336
ETC Testing	200,000	-	-	1,687
Total Toll Operations Expense	**7,961,552**	**3,892,890**	**48.90%**	**4,575,893**
Total Operations and Maintenance	**31,758,053**	**26,906,922**	**84.72%**	**20,069,714**
Other Expenses				
Special Projects and Contingencies				
HERO	148,000	135,510	91.56%	135,510
Special Projects	150,000	-	-	28,662
71 Express Net Revenue Payment	4,000,000	1,331,694	33.29%	2,538,012
Technology Initiatives	185,000	41,395	22.38%	149,643
Other Contractual Svcs	370,000	208,500	56.35%	440,421
Contingency	300,000	-	-	20,000
Total Special Projects and Contingencies	**5,153,000**	**1,717,098**	**33.32%**	**3,312,248**
Non Cash Expenses				
Amortization Expense	1,125,000	1,282,520	114.00%	829,583
Amort Expense - Refund Savings	2,715,425	8,198,450	301.92%	2,027,045
Dep Exp - Furniture & Fixtures	2,614	2,396	91.66%	2,396
Dep Expense - Equipment	2,500	2,292	91.66%	2,292
Dep Expense - Autos & Trucks	43,085	32,433	75.28%	31,975
Dep Expense - Buildng & Toll Fac	176,748	162,019	91.67%	162,019
Dep Expense - Highways & Bridges	49,342,469	46,403,082	94.04%	31,885,642
Dep Expense - Toll Equipment	4,060,300	3,734,897	91.99%	3,353,012
Dep Expense - Signs	1,202,171	931,857	77.51%	931,857
Dep Expense - Land Improvements	1,163,209	811,190	69.74%	811,190
Depreciation Expense - Computers	192,000	173,324	90.27%	175,607
Undevelopable Projects	-	-	-	4,468,748
Total Non Cash Expenses	**60,025,522**	**61,734,459**	**102.85%**	**44,681,365**
Total Other Expenses	**65,178,522**	**63,451,557**	**97.35%**	**47,993,612**

Central Texas Regional Mobility Authority
Income Statement
For the Period Ending May 31, 2022

	Budget Amount FY 2022	Actual Year to Date	Percent of Budget	Actual Prior Year to Date
Non Operating Expenses				
Bond Issuance Expense	1,227,474	4,811,971	392.02%	5,549,204
Loan Fee Expense	50,000	14,500	29.00%	28,000
Interest Expense	83,789,516	71,355,239	85.16%	45,414,974
CAMPO RIF Payment	-	5,000,000	-	-
Community Initiatives	57,500	52,670	91.60%	62,050
Total Non Operating Expenses	**85,124,490**	**81,234,380**	**95.43%**	**51,054,228**
TOTAL EXPENSES	**$194,755,151**	**$179,238,436**	**92.03%**	**$126,855,002**
Net Income	**($40,449,387)**	**($16,500,310)**		**($21,158,845)**

Central Texas Regional Mobility Authority
Balance Sheet
as of May 31, 2022

	as of 05/31/2022		as of 05/31/2021	
ASSETS				
Current Assets				
Cash				
Regions Operating Account	$ 1,956,500		$ 743,353	
Cash in TexStar	40,906		440,198	
Regions Payroll Account	271,062		277,367	
Restricted Cash				
Goldman Sachs FSGF 465	710,446,400		867,197,599	
Restricted Cash - TexSTAR	191,065,956		167,848,150	
Overpayments account	574,899		719,382	
Total Cash and Cash Equivalents		904,355,722		1,037,226,049
Accounts Receivable				
Accounts Receivable	2,770,089		2,770,089	
Due From Other Agencies	85,302		76,330	
Due From TTA	5,277,101		5,658,592	
Due From NTTA	1,422,150		1,091,869	
Due From HCTRA	2,015,881		1,595,614	
Due From TxDOT	690,038		1,699,704	
Interest Receivable	1,628,239		844,423	
Total Receivables		13,888,799		13,736,620
Short Term Investments				
Treasuries	78,740,495		269,755,102	
Agencies	153,878,007		-	
Total Short Term Investments		232,618,502		269,755,102
Total Current Assets		1,150,863,024		1,320,717,771
Total Construction in Progress		278,410,564		697,769,947
Fixed Assets (Net of Depreciation and Amortization)				
Computers	114,264		303,345	
Computer Software	1,409,552		2,585,565	
Furniture and Fixtures	2,396		5,010	
Equipment	9,832		2,332	
Autos and Trucks	98,328		41,444	
Buildings and Toll Facilities	4,431,748		4,608,495	
Highways and Bridges	1,719,813,729		1,161,773,480	
Toll Equipment	20,224,682		19,520,236	
Signs	13,200,720		13,740,199	
Land Improvements	6,273,013		7,157,947	
Right of way	88,149,606		88,149,606	
Leasehold Improvements	48,557		94,700	
Total Fixed Assets		1,853,776,427		1,297,982,358
Other Assets				
Intangible Assets-Net	170,285,469		135,646,458	
2005 Bond Insurance Costs	3,451,717		3,665,225	
Prepaid Insurance	170,751		182,070	
Deferred Outflows (pension related)	637,414		198,767	
Pension Asset	591,247		896,834	
Total Other Assets		175,136,598		140,589,355
Total Assets		$ 3,458,186,614		$ 3,457,059,431

Central Texas Regional Mobility Authority
Balance Sheet
as of May 31, 2022

	as of 05/31/2022		as of 05/31/2021	
LIABILITIES				
Current Liabilities				
Accounts Payable	$ 36,383,013		$ 21,736,914	
Construction Payable	5,502,756		14,610,250	
Overpayments	578,349		722,663	
Interest Payable	46,913,191		34,221,866	
TCDRS Payable	68,880		58,848	
Medical Reimbursement Payable	(3,280)		-	
Due to other Agencies	1,873		9,511	
Due to TTA	864,520		547,500	
Due to NTTA	-		60,464	
Due to HCTRA	144,649		118,870	
Due to Other Entities	929,517		1,193,580	
71E TxDOT Obligation - ST	782,449		471,091	
Total Current Liabilities		92,165,917		73,751,557
Long Term Liabilities				
Compensated Absences	283,554		372,715	
Deferred Inflows (pension related)	109,052		164,402	
Long Term Payables		392,606		537,118
Bonds Payable				
Senior Lien Revenue Bonds:				
Senior Lien Revenue Bonds 2010	87,067,632		80,810,345	
Senior Lien Revenue Bonds 2011	18,744,002		18,471,749	
Senior Refunding Bonds 2013	3,475,000		7,080,000	
Senior Lien Revenue Bonds 2015	10,000,000		298,790,000	
Senior Lien Refunding Revenue Bonds 2016	70,790,000		348,295,000	
Senior Lien Revenue Bonds 2018	44,345,000		44,345,000	
Senior Lien Revenue Bonds 2020A	50,265,000		50,265,000	
Senior Lien Refunding Bonds 2020B	55,600,000		56,205,000	
Senior Lien Refunding Bonds 2020C	138,435,000		138,435,000	
Senior Lien Revenue Bonds 2020E	167,160,000		167,160,000	
Senior Lien Revenue Bonds 2021B	255,075,000		255,075,000	
Senior Lien Refunding Bonds 2021D	274,625,000		-	
Senior Lien Refunding Bonds 2021E	335,610,000		-	
Sn Lien Rev Bnd Prem/Disc 2013	1,043,652		2,832,769	
Sn Lien Revenue Bnd Prem 2015	-		17,287,543	
Senior Lien Premium 2016 Revenue Bonds	7,675,095		39,291,386	
Sn Lien Revenue Bond Premium 2018	3,172,005		3,438,578	
Senior Lien Revenue Bond Premium 2020A	11,356,825		11,495,500	
Senior Lien Refunding Bond Premium 2020B	11,816,245		12,351,321	
Senior Lien Revenue Bonds Premium 2020E	25,998,871		27,690,205	
Senior Lien Revenue Bonds Premium 2021B	53,552,733		53,760,480	
Senior Lien Refunding Bonds Premium 2021D	44,859,226		-	
Total Senior Lien Revenue Bonds		1,670,666,287		1,633,079,876

Central Texas Regional Mobility Authority
Balance Sheet
as of May 31, 2022

	as of 05/31/2022		as of 05/31/2021	
Sub Lien Revenue Bonds:				
Sub Lien Refunding Bonds 2013	2,725,000		5,320,000	
Sub Lien Refunding Bonds 2016	72,605,000		73,055,000	
Subordinated Lien BANs 2018	-		46,020,000	
Sub Lien Refunding Bonds 2020D	98,580,000		99,705,000	
Subordinated Lien BANs 2020F	110,875,000		110,875,000	
Subordinate Lien Refunding Bonds 2020G	61,570,000		61,570,000	
Subordinated Lien BANs 2021C	244,185,000		244,185,000	
Sub Refunding 2013 Prem/Disc	222,686		604,434	
Sub Refunding 2016 Prem/Disc	5,859,936		6,684,557	
Sub Lien BANS 2018 Premium	-		308,661	
Subordinated Lien BANs 2020F Premium	10,340,734		14,343,598	
Subordinated Lien Refunding Bonds Premium 2020G	7,201,884		7,605,856	
Sub Lien BANS 2021C Premium	34,886,855		42,498,532	
Total Sub Lien Revenue Bonds		649,052,094		712,775,638
Other Obligations				
TIFIA Note 2021	308,674,249		304,116,563	
71E TxDOT Obligation - LT	55,077,264		60,728,211	
Regions 2017 MoPAC Note	-		24,990,900	
Regions 2022 MoPac Loan	24,990,900		-	
Total Other Obligations		388,742,414		389,835,674
Total Long Term Liabilities		2,708,853,400		2,736,228,306
Total Liabilities		**2,801,019,317**		**2,809,979,864**
	NET ASSETS			
Contributed Capital		121,462,104		121,462,104
Net Assets Beginning		552,204,893		546,775,699
Current Year Operations		(16,499,700)		(21,158,235)
Total Net Assets		**657,167,297**		**647,079,568**
Total Liabilities and Net Assets		**$ 3,458,186,614**		**$ 3,457,059,431**

Central Texas Regional Mobility Authority
Statement of Cash Flow
as of May 2022

Cash flows from operating activities:

Receipts from toll revenues	$	156,498,569
Receipts from interest income		576,813
Payments to vendors		(43,492,243)
Payments to employees		(4,849,418)
Net cash flows provided by (used in) operating activities		108,733,721

Cash flows from capital and related financing activities:

2018 BAN Redemption	(5,957,859)
Bond Refunding	110,441,743
Issuance Expense	(4,811,971)
Payments on bonds	(142,293,157)
Interest payments	(75,855,309)
Acquisition of capital assets - non project	(70,323)
Acquisitions of construction in progress	(118,440,382)
Net cash flows provided by (used in) capital and related financing activities	(236,987,259)

Cash flows from investing activities:

Interest Receivable	(1,512,133)
Interest income	2,558,102
Purchase of investments	(500,593,969)
Proceeds from sale or maturity of investments	510,976,865
Net cash flows provided by (used in) investing activities	12,940,997
Net increase (decrease) in cash and cash equivalents	(115,312,541)
Cash and cash equivalents at beginning of period	1,019,668,263
Cash and cash equivalents at end of period	$ 904,355,722

Reconciliation of change in net assets to net cash provided by operating activities:

Operating income	$	56,250,006
Adjustments to reconcile change in net assets to net cash provided by operating activities:		
Depreciation and amortization		54,818,529
Changes in assets and liabilities:		
(Increase) decrease in accounts receivable		(4,689,150)
(Increase) decrease in prepaid expenses and other assets		(16,855)
(Decrease) increase in accounts payable		(2,646,041)
Increase (decrease) in accrued expenses		5,013,572
(Increase) in deferred outflows of resources		3,660
Total adjustments		52,483,715
Net cash flows provided by (used in) operating activities	$	108,733,721

Reconciliation of cash and cash equivalents:

Unrestricted cash and cash equivalents	$	72,816,433
Restricted cash and cash equivalents		831,539,290
Total	$	904,355,722

INVESTMENTS by FUND

Balance
May 31, 2022

Renewal & Replacement Fund			**TexSTAR**	191,106,861.50
TexSTAR	1,795.91		**Goldman Sachs**	713,739,587.00
Goldman Sachs	9,098,119.57		**Agencies & Treasury Notes**	232,623,961.63
Agencies/ Treasuries		9,099,915.48		
Grant Fund				$ 1,137,470,410.13
TexSTAR	455,038.96			
Goldman Sachs	7,186,859.47			
Agencies/ Treasuries	2,444,951.53	10,086,849.96		
Senior Debt Service Reserve Fund				
TexSTAR	90,794,150.83			
Goldman Sachs	7,247,275.61			
Agencies/ Treasuries	9,999,801.77	108,041,228.21		
2010 Senior Lien Debt Service Account				
Goldman Sachs	60,674.30	60,674.30		
2011 Sr Debt Service Accountt				
Goldman Sachs	1,554,672.76	1,554,672.76		
2013 Sr Debt Service Accountt				
Goldman Sachs	1,520,740.19	1,520,740.19		
2013 Sub Debt Service Account				
Goldman Sachs	1,192,541.98	1,192,541.98		
2013 Sub Debt Service Reserve Fund				
Goldman Sachs	123.31	781,604.83		15,021,857.96
TexSTAR	781,481.52			
2015 Sr Debt Service Account				
Goldman Sachs	4,732,582.59	4,732,582.59		
2015 Sr Capitalized Interest				
Goldman Sachs	-	-		
TexSTAR	-			
2016 Sr Lien Rev Refunding Debt Service Account				
Goldman Sachs	8,921,952.29	8,921,952.29		
2016 Sub Lien Rev Refunding Debt Service Account				
Goldman Sachs	1,859,120.91	1,859,120.91		
2016 Sub Lien Rev Refunding DSR				
Goldman Sachs	6,999,520.56			
Agencies/ Treasuries	-	6,999,520.56		
Operating Fund				
TexSTAR	40,905.65			
TexSTAR-Trustee	6,108,482.06			
Goldman Sachs	7,513,144.70	13,662,532.41		
Revenue Fund				
Goldman Sachs	8,432,960.76	8,432,960.76		
General Fund				
TexSTAR	90,946,178.12			
Goldman Sachs	23,080,887.32			
Agencies/ Treasuries	-	114,027,065.44		
71E Revenue Fund				
Goldman Sachs	20,883,864.70	20,883,864.70		
MoPac Revenue Fund				
Goldman Sachs	62,640.33	62,640.33		
MoPac General Fund				
Goldman Sachs	10,030,032.74	10,030,032.74		
MoPac Operating Fund				
Goldman Sachs	1,894,081.54	1,894,081.54		
MoPac Loan Repayment Fund				
Goldman Sachs	414,791.53	414,791.53		
2015B Project Account				
Goldman Sachs	41,996,817.58			
TexSTAR	350,261.32	42,347,078.90		
2015 TIFIA Project Account				
Goldman Sachs	40,413,796.38			
TexSTAR	695,849.49			
Agencies/ Treasuries	-	41,109,645.87		
2011 Sr Financial Assistance Fund				
Goldman Sachs	1,361,105.42	1,361,121.43		
TexSTAR	16.01			
2018 Sr Lien Project Cap I				
Goldman Sachs	1,306,947.73	1,306,947.73		
2018 Sr Lien Project Account				
Goldman Sachs	11,546,019.72			
TexSTAR	932,701.63	12,478,721.35		
2020A Senior Lien Debt Service Account				
Goldman Sachs	1,708,489.78	1,708,489.78		
2020 SH 45SW Project Account				
Goldman Sachs	0.00	0.00		
2020B Senior Lien Debt Service Account				
Goldman Sachs	1,384,439.68	1,384,439.68		
2020C Senior Lien Debt Service Account				
Goldman Sachs	1,686,584.84	1,686,584.84		
2020D Sub Lien Debt Service Account				
Goldman Sachs	1,712,183.95	1,712,183.95		
2020D Sub Debt Service Reserve Fund				
Goldman Sachs	8,124,928.17			
Agencies/ Treasuries	0.00	8,124,928.17		
2020E Senior Lien Project Account				
Goldman Sachs	131,387,760.85			
Agencies/ Treasuries	20,032,699.42	151,420,460.27		
2020E Senior Lien Project Cap Interest				
Goldman Sachs	25,430,557.93	25,430,557.93		
2020F Sub Lien Project Account				
Goldman Sachs	40,048,198.08			
Agencies/ Treasuries	0.00	40,048,198.08		
2020F Sub Lien Deb Service Account				
Goldman Sachs	2,310,478.64	2,310,478.64		
2020G Sub Lien Debt Service Account				
Goldman Sachs	1,063,851.68	1,063,851.68		
2020G Sub Lien Debt Service Reserve Account				
Goldman Sachs	2,361,154.09	2,361,154.09		
2021A Sub Lien Debt Service Reserve Account				
Goldman Sachs	9,382,861.08	9,382,861.08	27,650,068.73	
2021A Sub Debt Service Account				
Goldman Sachs	95.80	95.80		
2021B Senior Lien Cap I Project Fund				
Goldman Sachs	51,855,830.13	51,855,830.13		
2021B Senior Lien Project Account				
Goldman Sachs	130,406,830.21			
Agencies/ Treasuries	99,998,017.67	230,404,847.88		
2021C Sub Lien Cap I Project Fund				
Goldman Sachs	1,336.92	1,336.92		
2021C Sub Lien Project Account				
Goldman Sachs	70,278,858.11			
Agencies/ Treasuries	100,148,491.24	170,427,349.35		
2021C Sub Lien Debt Service Account				
Goldman Sachs	5,087,287.85	5,087,287.85		
2021D Senior Lien Debt Service Account				
Goldman Sachs	4,873,145.76	4,873,145.76		
2021E Senior Lien Debt Service Account				
Goldman Sachs	5,323,439.46	5,323,439.46		
		$ 1,137,470,410.13		

CTRMA INVESTMENT REPORT

	Balance 5/1/2022	Additions	Discount Amortization	Accrued Interest	Withdrawals	Balance 5/31/2022	Rate May
Month Ending 4/30/2022							
Amount in Trustee TexStar							
2011 Sr Lien Financial Assist Fund	16.01			0.00		16.01	0.6459%
2013 Sub Lien Debt Service Reserve	781,053.07			428.45		781,481.52	0.6459%
General Fund	90,896,316.18			49,861.94		90,946,178.12	0.6459%
Trustee Operating Fund	5,405,163.70	3,000,000.00		3,318.36	2,300,000.00	6,108,482.06	0.6459%
Renewal and Replacement	1,794.91			1.00		1,795.91	0.6459%
Grant Fund	454,789.47			249.49		455,038.96	0.6459%
Senior Lien Debt Service Reserve Fund	90,744,372.26			49,778.57		90,794,150.83	0.6459%
2015B Sr Ln Project	350,069.30			192.02		350,261.32	0.6459%
2015C TIFIA Project	695,468.00			381.49		695,849.49	0.6459%
2018 Sr Lien Project Account	932,190.27			511.36		932,701.63	0.6459%
	190,261,233.17	3,000,000.00		104,722.68	2,300,000.00	191,065,955.85	
Amount in TexStar Operating Fund	540,508.57	2,300,000.00		397.08	2,800,000.00	40,905.65	0.6459%
Goldman Sachs							
Operating Fund	7,508,713.26	3,006,482.96		1,768.04	3,003,819.56	7,513,144.70	0.6224%
2020 SH 45SW Project Account	660,882.30			155.75	661,038.05	0.00	0.6224%
2020A Senior Lien Debt Service Account	837,857.17	870,461.62		170.99		1,708,489.78	0.6224%
2020B Senior Lien Debt Service Account	1,107,422.09	276,791.59		226.00		1,384,439.68	0.6224%
2020C Senior Lien Debt Service Account	1,259,873.21	426,454.52		257.11		1,686,584.84	0.6224%
2020D Sub Lien Debt Service Account	1,369,591.78	342,312.67		279.50		1,712,183.95	0.6224%
2020D Sub Debt Service Reserve Fund	8,123,014.42			1,913.75		8,124,928.17	0.6224%
2020E Sr Lien Project Account	131,356,813.71			30,947.14		131,387,760.85	0.6224%
2020E Sr Ln Project Cap Interest	25,424,568.04			5,989.89		25,430,557.93	0.6224%
2020F Sub Lien Project Account	42,424,886.85	132,602.30		10,447.93	2,519,739.00	40,048,198.08	0.6224%
2020F Sub Lien Debt Service Account	1,848,153.05	461,948.43		377.16		2,310,478.64	0.6224%
2020G Sub Lien Debt Service Account	850,975.50	212,702.52		173.66		1,063,851.68	0.6224%
2020G Sub Debt Service Reserve Fund	2,264,769.08	95,863.53		521.48		2,361,154.09	0.6224%
2021A Sub Debt Service Reserve Fund	8,833,061.80	547,787.33		2,011.95		9,382,861.08	0.6224%
2021A Sub Debt Service Account	95.78			0.02		95.80	0.6224%
2021B Senior Lien Cap I Project Fund	51,843,616.05			12,214.08		51,855,830.13	0.6224%
2021B Senior Lien Project Account	130,376,113.74			30,716.47		130,406,830.21	0.6224%
2021C Sub Lien Cap I Project Fund	1,336.61			0.31		1,336.92	0.6224%
2021C Sub Lien Project Account	69,872,322.70	4,050,733.26		16,676.46	3,660,874.31	70,278,858.11	0.6224%
2021C Sub Lien Debt Service Account	4,069,241.21	1,017,216.22		830.42		5,087,287.85	0.6224%
2021D Senior Lien Debt Service Account	3,897,962.19	974,388.10		795.47		4,873,145.76	0.6224%
2021E Senior Lien Debt Service Account	4,258,168.81	1,064,401.67		868.98		5,323,439.46	0.6224%
2011 Sr Financial Assistance Fund	1,360,604.00			501.42		1,361,105.42	0.6224%
2010 Senior DSF	60,660.01			14.29		60,674.30	0.6224%
2011 Senior Lien Debt Service Account	1,243,605.05	310,813.91		253.80		1,554,672.76	0.6224%
2013 Senior Lien Debt Service Account	1,216,490.91	304,001.01		248.27		1,520,740.19	0.6224%
2013 Sub Debt Service Reserve Fund	123.28			0.03		123.31	0.6224%
2013 Subordinate Debt Service Account	953,977.37	238,369.91		194.70		1,192,541.98	0.6224%
2015A Sr Lien Debt Service Account	4,731,467.87			1,114.72		4,732,582.59	0.6224%
2015B Project Account	41,986,925.59			9,891.99		41,996,817.58	0.6224%
2015C TIFIA Project Account	42,036,692.25			9,917.54	1,632,813.41	40,413,796.38	0.6224%
2016 Sr Lien Rev Refunding Debt Service Account	7,774,111.12	1,146,348.85		1,492.32		8,921,952.29	0.6224%
2016 Sub Lien Rev Refunding Debt Service Account	1,487,113.01	371,704.41		303.49		1,859,120.91	0.6224%
2016 Sub Lien Rev Refunding DSR	6,997,871.88			1,648.68		6,999,520.56	0.6224%
2018 Sr Lien Project Cap I	1,306,639.89			307.84		1,306,947.73	0.6224%
2018 Sr Lien Project Account	11,585,524.18			2,757.31	42,261.77	11,546,019.72	0.6224%
Grant Fund	7,185,166.67			1,692.80		7,186,859.47	0.6224%
Renewal and Replacement	8,886,532.71	1,504,094.98		30.89	1,292,539.01	9,098,119.57	0.6224%
Revenue Fund	8,886,532.71	15,617,067.58		2,018.99	16,072,658.52	8,432,960.76	0.6224%
General Fund	22,210,954.40	2,558,629.91		11,717.55	1,700,414.54	23,080,887.32	0.6224%
Senior Lien Debt Service Reserve Fund	7,238,668.73			8,606.88		7,247,275.61	0.6224%
71E Revenue Fund	20,117,647.59	884,259.92		4,650.83	122,693.64	20,883,864.70	0.6224%
MoPac Revenue Fund	49,676.61	1,074,858.27		80.49	1,061,975.04	62,640.33	0.6224%
MoPac General Fund	1,203,689.14	8,935,675.32		140.77	109,472.49	10,030,032.74	0.6224%
MoPac Operating Fund	2,444,043.64			581.96	550,544.06	1,894,081.54	0.6224%
MoPac Loan Repayment Fund	8,297,492.67			1,962.22	7,884,663.36	414,791.53	0.6224%
	707,451,650.63	46,425,970.79		177,472.34	40,315,506.76	713,739,587.00	
Amount in Fed Agencies and Treasuries							
Amortized Principal	232,805,277.47		(181,315.84)	0.00		232,623,961.63	
	232,805,277.47		(181,315.84)	0.00		232,623,961.63	
Certificates of Deposit							
Total in Pools	190,801,741.74	5,300,000.00		105,119.76	5,100,000.00	191,106,861.50	
Total in GS FSGF	707,451,650.63	46,425,970.79		177,472.34	40,315,506.76	713,739,587.00	
Total in Fed Agencies and Treasuries	232,805,277.47	0.00	(181,315.84)	0.00	0.00	232,623,961.63	
Total Invested	1,131,058,669.84	51,725,970.79		282,592.10	45,415,506.76	1,137,470,410.13	

All Investments in the portfollio are in compliance with the CTRMA's Investment policy and the relevent provisions of the Public Funds Investment Act Chapter 2256.023

José Hernández, CFO

Mary Temple, Controller

12

Allocation of Funds

17%

20%

63%

- ■ Total in Pools
- ■ Total in Money Market
- ■ Total in Fed Agencies
- ■ Total in CD's
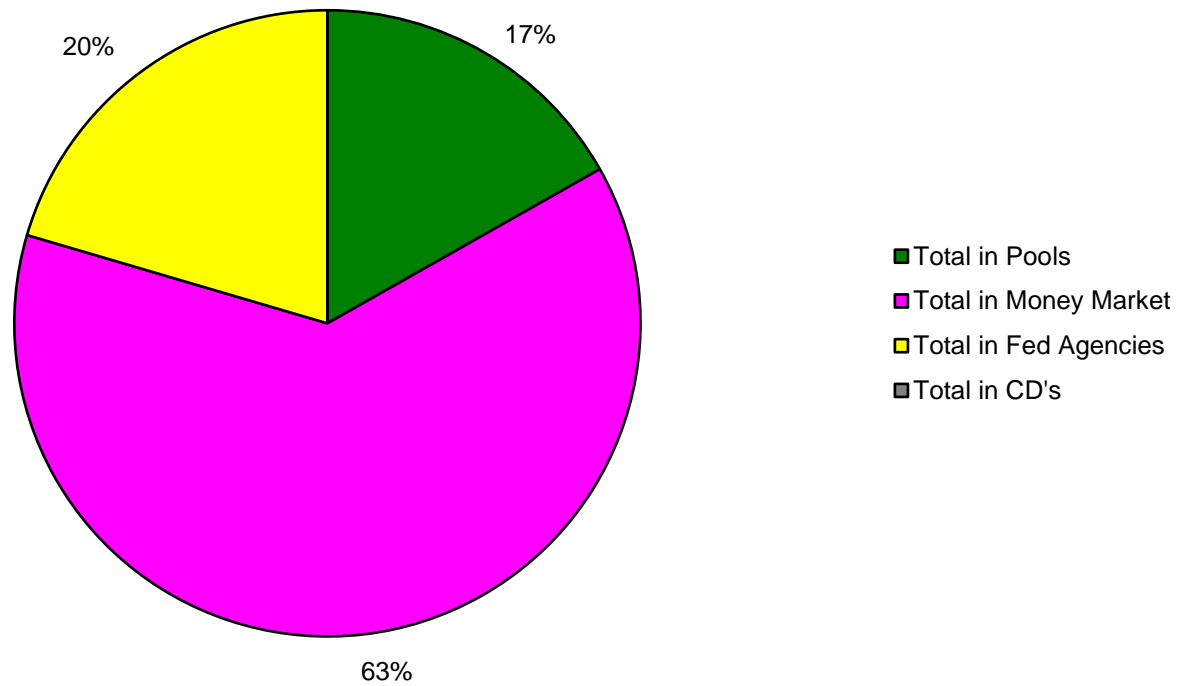
Amount of Investments As of						May 31, 2022		
Agency	CUSIP #	COST	Book Value	Market Value	Yield to Maturity	Purchased	Matures	FUND
Treasury	912828XW5	79,783,880.00	78,873,764.45	78,813,556.80	0.0529%	9/24/2021	6/30/2022	2021C Sr Project
Agency - Federal Home Loan Bank	313379Q69	20,294,294.80	20,032,699.42	20,007,000.00	0.0550%	9/24/2021	6/10/2022	2020E Sr Project
Agency - Federal Home Loan Bank	313379Q69a	21,552,541.08	21,274,726.79	21,247,434.00	0.0550%	9/24/2021	6/10/2022	2021C Sub Project
Agency - Federal Farm Credit	3133EM5T5	2,444,854.60	2,444,951.53	2,437,665.00	0.0076%	9/24/2021	9/21/2022	Grant Fund
Agency - Federal Farm Credit	3133EM5T5a	9,999,405.30	9,999,801.77	9,970,000.00	0.0076%	9/24/2021	9/21/2022	Sr Lien DSR
Agency - Federal Farm Credit	3133EM5T5b	99,994,053.00	99,998,017.67	99,700,000.00	0.0076%	9/24/2021	9/21/2022	2021B Sr Project
		234,069,028.78	232,623,961.63	232,175,655.80				

			Cummulative					Interest Income		
Agency	CUSIP #	COST	Amortization	Book Value	Maturity Value			Accrued Interest	Amortization	Interest Earned
Treasury	912828XW5	79,783,880.00	(910,115.56)	78,873,764.44	78,760,000.00			114,858.33	(113,764.44)	1,093.89
Agency - Federal Home Loan Bank	313379Q69	20,294,294.80	(261,595.38)	20,032,699.42	20,000,000.00			35,416.67	(32,699.42)	2,717.25
Agency - Federal Home Loan Bank	313379Q69a	21,552,541.08	(277,814.29)	21,274,726.79	21,240,000.00			37,612.50	(34,726.79)	2,885.71
Agency - Federal Farm Credit	3133EM5T5	2,444,854.60	96.93	2,444,951.53	2,445,000.00			142.62	12.12	154.74
Agency - Federal Farm Credit	3133EM5T5a	9,999,405.30	396.47	9,999,801.77	10,000,000.00			583.33	(632.89)	(49.56)
Agency - Federal Farm Credit	3133EM5T5b	99,994,053.00	3,964.68	99,998,017.68	100,000,000.00			5,833.34	495.58	6,328.92
		234,069,028.78	(1,445,067.15)	232,623,961.63	232,445,000.00			194,446.79	(181,315.84)	13,130.95

ESCROW FUNDS

Travis County Escrow Fund - Elroy Road

	Balance 5/1/2022	Additions	Accrued Interest	Withdrawals	Balance 5/31/2022
Goldman Sachs	4,118,114.21		1,033.70	294,611.38	3,824,536.53

Travis County Escrow Fund - Ross Road

	Balance 5/1/2022	Additions	Accrued Interest	Withdrawals	Balance 5/31/2022
Goldman Sachs	141,356.84		23.15	1,643.94	139,736.05

Travis County Escrow Fund - Old San Antonio Road

	Balance 5/1/2022	Additions	Accrued Interest	Withdrawals	Balance 5/31/2022
Goldman Sachs	58,541.24		13.93	3,638.97	54,916.20

Travis County Escrow Fund - Old Lockhart Road

	Balance 5/1/2022	Additions	Accrued Interest	Withdrawals	Balance 5/31/2022
Goldman Sachs	247,716.24		59.16	4,609.78	243,165.62

Travis County Escrow Fund - County Line Road

	Balance 5/1/2022	Additions	Accrued Interest	Withdrawals	Balance 5/31/2022
Goldman Sachs	402,671.49		95.59	14,834.68	387,932.40

Travis County Escrow Fund - South Pleasant Valley Road

	Balance 5/1/2022	Additions	Accrued Interest	Withdrawals	Balance 5/31/2022
Goldman Sachs	344,982.13		82.16	1,533.88	343,530.41

Travis County Escrow Fund - Thaxton Road

	Balance 5/1/2022	Additions	Accrued Interest	Withdrawals	Balance 5/31/2022
Goldman Sachs	150,767.11		36.53	3,505.30	147,298.34

Travis County Escrow Fund - Pearce Lane Road

	Balance 5/1/2022	Additions	Accrued Interest	Withdrawals	Balance 5/31/2022
Goldman Sachs	335,740.83		80.22	5,787.41	330,033.64

PERFORMANCE

As of May 31, 2022

Current Invested Balance	$9,701,777,049.61
Weighted Average Maturity (1)	48 Days
Weighted Average Life (2)	64 Days
Net Asset Value	0.999841
Total Number of Participants	988
Management Fee on Invested Balance	0.06%*
Interest Distributed	$5,580,018.18
Management Fee Collected	$472,868.36
% of Portfolio Invested Beyond 1 Year	2.49%
Standard & Poor's Current Rating	AAAm

Rates reflect historical information and are not an indication of future performance.

May Averages

Average Invested Balance	$9,279,608,459.35
Average Monthly Yield, on a simple basis	0.6459%
Average Weighted Maturity (1)	43 Days
Average Weighted Life (2)	61 Days

Definition of Weighted Average Maturity (1) & (2)

(1) This weighted average maturity calculation uses the SEC Rule 2a-7 definition for stated maturity for any floating rate instrument held in the portfolio to determine the weighted average maturity for the pool. This Rule specifies that a variable rate instruction to be paid in 397 calendar days or less shall be deemed to have a maturity equal to the period remaining until the next readjustment of the interest rate. (2) This weighted average maturity calculation uses the final maturity of any floating rate instruments held in the portfolio to calculate the weighted average maturity for the pool.

The maximum management fee authorized for the TexSTAR Cash Reserve Fund is 12 basis points. This fee may be waved in full or in part in the discretion of the TexSTAR co-administrators at any time as provided for in the TexSTAR Information Statement.

NEW PARTICIPANTS

We would like to welcome the following entities who joined the TexSTAR program in May:

* Fort Bend County WCID No. 8 * City of Stafford

HOLIDAY REMINDER

In observance of **Independence Day, TexSTAR will be closed on Monday, July 4, 2022.** All ACH transactions initiated on Friday, July 1st will settle on Tuesday July 5th. Notification of any early transaction deadlines on the business day preceding this holiday will be sent by email to the primary contact on file for all TexSTAR participants. Please plan accordingly for your liquidity needs.

ECONOMIC COMMENTARY

Market review

SurgingPost-pandemic momentum showed signs of moderating in May as persistently high inflation, fiscal drag, and the tightening of monetary policy weighed on growth. Nevertheless, consumer demand appeared to be resilient. Despite headwinds attributed to strong price increases, recent declines in equity markets, and low levels of consumer sentiment, nominal retail sales increased 0.9% month-over-month (m/m) in April as concerns about Covid diminished. Consumer price inflation was stronger than expected for April with headline and core CPI rising by 0.3% and 0.6% m/m, respectively. Consumers saw some relief with declines in energy prices (-2.7% m/m), apparel (-0.8% m/m) and used vehicles (-0.4% m/m). However, core inflation, which excludes the volatile energy and food items, pointed to the continued broadening of inflation pressures in the economy. Not only was the core reading above expectations, but the core inflation firmness has also shifted recently from goods to services, driven by pent up demand to spend on services in "reopening" sectors. Airline fares were up 18.6% m/m, continuing a recent strong run that brought prices well above pre-pandemic levels, and the index for hotel fares jumped by 2% m/m in April. Restaurant prices, or "food away from home", also rose 0.6% m/m. Services inflation may be taking the baton from goods. The contribution to inflation from core services ex-shelter rose to 1.2% from 1.1%, while the contribution from core goods fell to 1.3% from 1.4%. Continued strength in services spending is likely to keep core inflation elevated despite cooling goods inflation. Higher home and rent prices continued to feed into inflation, with tenants' rent up 0.56% and owners' equivalent rent up 0.45% m/m. Shelter is most Americans' major expenditure and has a large weight in core inflation, so these effects will likely linger.

INFORMATION AT A GLANCE

PORTFOLIO BY TYPE OF INVESTMENT AS OF MAY 31, 2022

Treasuries 47.48%
Agencies 20.55%
Repurchase Agreements 31.97%
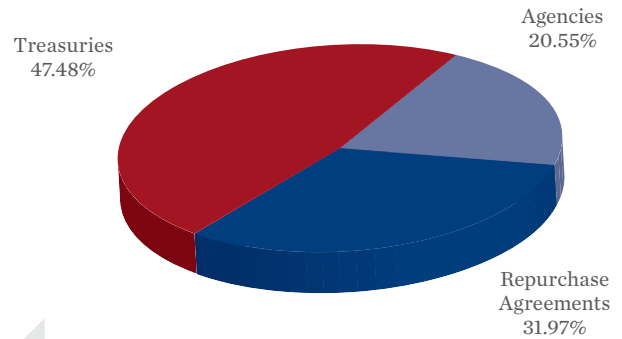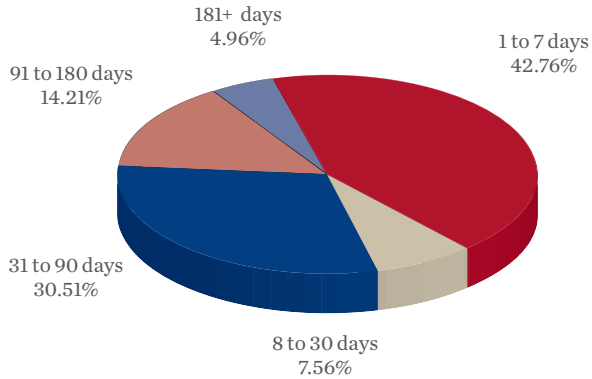
PORTFOLIO BY MATURITY AS OF MAY 31, 2022 (1)

181+ days 4.96%
91 to 180 days 14.21%
31 to 90 days 30.51%
8 to 30 days 7.56%
1 to 7 days 42.76%
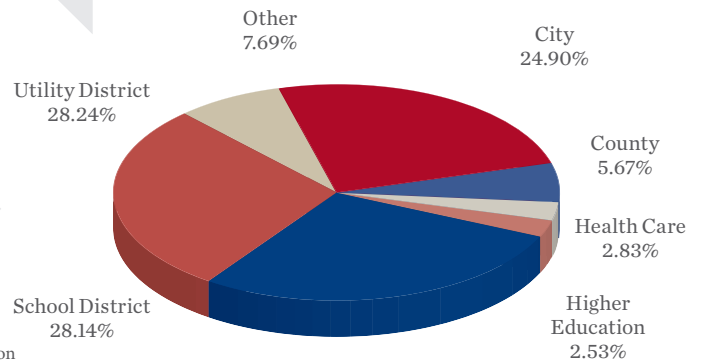
DISTRIBUTION OF PARTICIPANTS BY TYPE AS OF MAY 31, 2022

Other 7.69%
City 24.90%
County 5.67%
Health Care 2.83%
Higher Education 2.53%
School District 28.14%
Utility District 28.24%

(1) Portfolio by Maturity is calculated using WAM (1) definition for stated maturity. See page 1 for definition

HISTORICAL PROGRAM INFORMATION

MONTH	AVERAGE RATE	BOOK VALUE	MARKET VALUE	NET ASSET VALUE	WAM (1)	WAL (2)	NUMBER OF PARTICIPANTS
May 22	0.6459%	$9,701,777,049.61	$9,700,243,468.41	0.999841	43	61	988
Apr 22	0.3225%	8,985,925,505.16	8,984,338,322.90	0.999818	39	60	986
Mar 22	0.1070%	9,050,970,696.95	9,050,137,013.72	0.999907	27	38	981
Feb 22	0.0104%	9,779,113,455.23	9,778,353,196.78	0.999922	26	32	979
Jan 22	0.0100%	9,399,813,099.48	9,399,092,954.95	0.999923	31	38	977
Dec 21	0.0139%	8,763,539,414.27	8,763,577,847.71	1.000011	40	52	977
Nov 21	0.0102%	8,132,746,877.26	8,133,007,416.80	1.000032	47	62	965
Oct 21	0.0100%	8,641,191,692.82	8,641,540,291.95	1.000040	41	58	963
Sep 21	0.0100%	9,019,799,096.23	9,020,390,786.23	1.000065	43	62	958
Aug 21	0.0100%	8,945,411,473.29	8,945,978,474.21	1.000063	52	74	955
Jul 21	0.0100%	9,139,785,043.86	9,140,404,119.19	1.000071	41	68	949
Jun 21	0.0100%	9,172,985,137.74	9,173,600,615.43	1.000084	40	71	943

PORTFOLIO ASSET SUMMARY AS OF MAY 31, 2022

	BOOK VALUE	MARKET VALUE
Uninvested Balance	$ 223.35	$ 223.35
Accrual of Interest Income	2,369,012.21	2,369,012.21
Interest and Management Fees Payable	(5,653,017.12)	(5,653,017.12)
Payable for Investment Purchased	(153,536,758.76)	(153,536,758.76)
Repurchase Agreement	3,151,338,999.49	3,151,338,999.49
Government Securities	6,707,258,590.44	6,705,725,009.24
TOTAL	**$ 9,701,777,049.61**	**$ 9,700,243,468.41**

Market value of collateral supporting the Repurchase Agreements is at least 102% of the Book Value. The portfolio is managed by J.P. Morgan Chase & Co. and the assets are safekept in a separate custodial account at the Federal Reserve Bank in the name of TexSTAR. The only source of payment to the Participants are the assets of TexSTAR. There is no secondary source of payment for the pool such as insurance or guarantee. Should you require a copy of the portfolio, please contact TexSTAR Participant Services.

TEXSTAR VERSUS 90-DAY TREASURY BILL

Legend: TexSTAR Rate — 90 Day T-BILL Rate
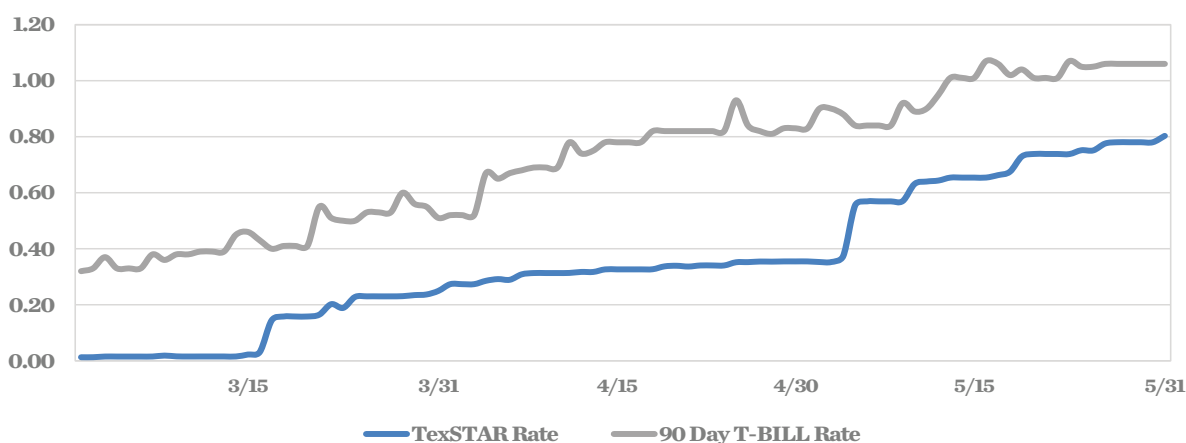
This material is for information purposes only. This information does not represent an offer to buy or sell a security. The above rate information is obtained from sources that are believed to be reliable; however, its accuracy or completeness may be subject to change. The TexSTAR management fee may be waived in full or in part at the discretion of the TexSTAR co-administrators and the TexSTAR rate for the period shown reflects waiver of fees. This table represents historical investment performance/return to the customer, net of fees, and is not an indication of future performance. An investment in the security is not insured or guaranteed by the Federal Deposit Insurance Corporation or any other government agency. Although the issuer seeks to preserve the value of an investment of $1.00 per share, it is possible to lose money by investing in the security. Information about these and other program details are in the fund's Information Statement which should be read carefully before investing. The yield on the 90-Day Treasury Bill ("T-Bill Yield") is shown for comparative purposes only. When comparing the investment returns of the TexSTAR pool to the T-Bill Yield, you should know that the TexSTAR pool consists of allocations of specific diversified securities as detailed in the respective Information Statements. The T-Bill Yield is taken from Bloomberg Finance L.P. and represents the daily closing yield on the then current 90-Day T-Bill. The TexSTAR yield is calculated in accordance with regulations governing the registration of open-end management investment companies under the Investment Company Act of 1940 as promulgated from time to time by the federal Securities and Exchange Commission.

DAILY SUMMARY FOR MAY 2022

DATE	MNY MKT FUND EQUIV. [SEC Std.]	DAILY ALLOCATION FACTOR	INVESTED BALANCE	MARKET VALUE PER SHARE	WAM DAYS (1)	WAL DAYS (2)
5/1/2022	0.3549%	0.000009724	$8,985,925,505.16	0.999818	36	56
5/2/2022	0.3528%	0.000009665	$9,088,579,690.63	0.999818	35	55
5/3/2022	0.3528%	0.000009666	$9,179,091,335.22	0.999781	34	53
5/4/2022	0.3741%	0.000010249	$9,173,734,615.15	0.999778	37	56
5/5/2022	0.5549%	0.000015204	$9,166,904,371.35	0.999831	37	56
5/6/2022	0.5692%	0.000015595	$9,147,716,591.38	0.999835	35	54
5/7/2022	0.5692%	0.000015595	$9,147,716,591.38	0.999835	35	54
5/8/2022	0.5692%	0.000015595	$9,147,716,591.38	0.999835	35	54
5/9/2022	0.5705%	0.000015630	$9,111,427,806.27	0.999836	38	56
5/10/2022	0.6315%	0.000017301	$9,070,988,006.41	0.999835	43	62
5/11/2022	0.6400%	0.000017535	$9,098,173,879.18	0.999827	42	61
5/12/2022	0.6436%	0.000017634	$9,061,271,726.31	0.999836	42	61
5/13/2022	0.6541%	0.000017920	$9,174,997,973.00	0.999802	42	61
5/14/2022	0.6541%	0.000017920	$9,174,997,973.00	0.999802	42	61
5/15/2022	0.6541%	0.000017920	$9,174,997,973.00	0.999802	42	61
5/16/2022	0.6542%	0.000017923	$9,138,755,769.65	0.999784	42	61
5/17/2022	0.6629%	0.000018161	$9,122,035,100.55	0.999767	46	63
5/18/2022	0.6750%	0.000018492	$9,155,840,821.98	0.999793	46	64
5/19/2022	0.7294%	0.000019983	$9,139,546,831.80	0.999828	47	65
5/20/2022	0.7384%	0.000020231	$9,291,811,055.87	0.999845	47	65
5/21/2022	0.7384%	0.000020231	$9,291,811,055.87	0.999845	47	65
5/22/2022	0.7384%	0.000020231	$9,291,811,055.87	0.999845	47	65
5/23/2022	0.7381%	0.000020222	$9,289,956,339.30	0.999849	46	64
5/24/2022	0.7517%	0.000020594	$9,489,680,937.83	0.999875	47	64
5/25/2022	0.7512%	0.000020580	$9,571,709,031.12	0.999875	46	63
5/26/2022	0.7757%	0.000021251	$9,670,920,813.61	0.999883	48	65
5/27/2022	0.7803%	0.000021377	$9,651,991,437.03	0.999871	47	63
5/28/2022	0.7803%	0.000021377	$9,651,991,437.03	0.999871	47	63
5/29/2022	0.7803%	0.000021377	$9,651,991,437.03	0.999871	47	63
5/30/2022	0.7803%	0.000021377	$9,651,991,437.03	0.999871	47	63
5/31/2022	0.8030%	0.000022001	$9,701,777,049.61	0.999841	48	64
			18			
Average	**0.6459%**	**0.000017696**	**$9,279,608,459.35**		**43**	**61**

As anticipated, the Federal Open Market Committee (FOMC) voted to raise the federal funds target rate range by 0.50% to 0.75%-1.00% and signaled similar 50 basis point (bp) rate increases would be on the table for the next couple of meetings. Notably, Chairman Powell ruled out the possibility for a larger 75 bp increase, which provided investors some comfort. In addition, the Committee also announced an end to quantitative easing, and will begin to reduce the size of its ~$9 trillion balance sheet beginning in June. The Fed will initially decrease the size of its U.S. Treasury and agency mortgage-backed security (MBS) holdings by $30bn and $17.5bn per month, respectively. These caps will be doubled to $60bn and $35bn per month in September. The labor market remained strong in May with steady job gains, a solid increase in labor force participation and some easing in wage pressures. Nonfarm employment increased 390,000, with the strongest gains seen in areas most chronically short of workers such as construction, healthcare, leisure and hospitality. By contrast, retail employment had its worst month of the expansion, down 61,000, reflecting a consumer switch from goods to services as pandemic effects fade. The unemployment rate held steady at 3.6% while the participation rate ticked up to 62.3%, a sign that abundant jobs and higher wages are drawing people back to work. Wage growth was slightly milder than expected with the average hourly earnings increasing 0.3% in May. Year-over-year (y/y) overall wage growth has now slipped to 5.2% from a peak of 5.6% in March.

Late in the month, the minutes from the May 3-4 FOMC meeting reaffirmed the Fed's commitment to fighting inflation. Many participants felt it would be possible to get to a neutral rate later this year, but a restrictive stance could become appropriate. Participants also acknowledged that financial conditions have tightened meaningfully since the beginning of the year, but that valuations in some assets remain elevated. Despite the hawkish minutes, softening economic data brought down year-end rate hike expectations as global Flash PMIs pointed to a slowing expansion, with the combined manufacturing and services index for the U.S. falling to 53.8 from 56.0, the softest in four months. New home sales fell 16.6% in April, another sign of a cooling housing market. Supply of new homes for sale increased to 9 months' worth of inventory at the current sales rate, up from 7 months in March and higher than under 5 months this time last year. Median sales prices continued to rise. Volatility remained elevated; and the month ended with two- to 10-year yields lower amid rising concerns about a slowdown in economic growth and falling inflation expectations. Meanwhile short-term Treasury bill yields rose as the Fed continued to stress that reducing inflation is the primary goal. The two-year Treasury yield ended the month down 16 bps at 2.56% while the three-month Treasury bill yield rose 22 bps to 1.04%.

Outlook

Concerns around inflation have been aggravated by concerns about economic growth. Financial conditions have tightened in recent months as the Fed turned more hawkish and started raising rates. Fed officials have embraced this tightening and policymakers are trying to weaken the economy and engineer a "soft landing." US labor markets are still at their tightest levels in the post-war era; and supply chain pressures, which spiked last year, have yet to abate (some of which is due to the lockdowns in China). On top of all that, rising food and energy prices are now feeding into airlines, restaurant and lodging prices. Bottom line: there's a lot riding on when inflation peaks. Even if that happens now (which we do not believe), the Fed has a way to go before it can stop tightening and is willing to let financial conditions tighten to bring inflation down.

The economy still appears to be barreling past traditional estimates of full employment while inflation has risen to 40-year highs. However, at the same time, both growth and inflation should slow due to headwinds from fiscal drag, a too-high dollar and slumping confidence. The Congressional Budget Office recently projected a decline in the budget deficit from 12.4% of GDP in fiscal 2021 to just 4.2% of GDP in fiscal 2022, representing the sharpest fiscal drag seen since the demobilization following World War II. A high dollar, combined with global weakness from the war in Ukraine and China's attempts to battle Covid, should slow the growth in U.S. exports. 30-year fixed rate mortgage rates have risen from 3.11% at the end of last year to over 5%, contributing to a sharp decline in both new and existing home sales in April. Consumer sentiment remains in the doldrums with the May reading of the University of Michigan Consumer Sentiment Index falling to its lowest level since 2011. However, two factors should act as strong counterweights to these recessionary impulses. First, pent-up demand appears to be at levels unprecedented in the modern era. Chronic supply chain issues and labor shortages have suppressed production with very low inventories of vehicles, homes and consumer goods for sale.

ECONOMIC COMMENTARY (cont.)

On top of this, there is a pent-up demand for travel and entertainment after the pandemic as well as all the spending involved in long-postponed family celebrations. This should help sustain overall consumer demand even as budgets tighten. Second, while a lack of workers is constraining the long-term growth of the U.S. economy, it is also making it very difficult to forecast any increase in the unemployment rate. This lack of workers should also spur stronger investment spending and productivity growth, helping sustain the economic expansion.

The same forces slowing economic growth should alleviate some inflation pressures. April data showed some small signs of improvement with the core personal consumption deflator rising 4.9% y/y, its lowest reading since December. Food and energy prices are continuing to rise, partly due to the fallout from the war in Ukraine. However, barring further disruptions, these high prices should induce increases in production, paving the way for stabilization and declines in commodity prices later in the year. Overall, we expect inflation, as measured by the core consumption deflator, to fall to 4.0% y/y by the fourth quarter of this year and 3.2% by the fourth quarter of 2023.

The Federal Reserve would, undoubtedly, like to see a more rapid decline in inflation. However, one key assumption in our outlook is that later in the year, as the Fed sees both growth and inflation slowing, it softens its recently hawkish tone, providing some relief to both the bond and stock markets. This doesn't imply significantly easier policy this year – we still expect two more 50-bp rate hikes followed by three 25-bp increases, taking the federal funds rate to a range of 2.50%-2.75% by the end of the year. However, it should reduce fears of anything more aggressive this year or anything more than a slow further increase in short-term rates in 2023. If this transpires, the economy could well settle into a period of slow growth, declining inflation and relatively steady unemployment. That being said, there remains a significant risk of recession later in 2022 or in 2023, either because of aggressive policy tightening or some other issue. If the U.S. were to slip into recession over the next year, it would likely be a shallower recession, deep enough to mop up inflation pressures and curtail job openings but not bad enough to damage the long-term prospects of the economy overall or most companies operating within it. In time, growth would resume, margins would recover, and markets would rebound.

This information is an excerpt from an economic report dated May 2022 provided to TexSTAR by JP Morgan Asset Management, Inc., the investment manager of the TexSTAR pool.

CENTRAL TEXAS REGIONAL MOBILITY AUTHORITY

Strategic Plan Relevance:	Regional Mobility
Department:	Finance
Contact:	James M. Bass, Executive Director
Associated Costs:	N/A
Funding Source:	N/A
Action Requested:	Consider and act on draft resolution

Project Description/Background: Staff submitted a Preliminary FY 2023 Operating Budget to the Board on May 23, 2022. Staff subsequently refined several line item expenses. Adjustments have been finalized and submitted to the Board in preparation for this meeting.

Action Requested/Staff Recommendation – Staff recommends approval of the FY 2023 Operating Budget

Backup Provided: Draft Resolution
FY 2023 Draft Operating Budget
to be provided at Board Meeting

**GENERAL MEETING OF THE BOARD OF DIRECTORS
OF THE
CENTRAL TEXAS REGIONAL MOBILITY AUTHORITY**

RESOLUTION NO. 22-0XX

APPROVING THE BUDGET FOR FISCAL YEAR 2023

WHEREAS, the Central Texas Regional Mobility Authority (CTRMA) was created pursuant to the request of Travis and Williamson Counties and in accordance with provisions of the Transportation Code and the petition and approval process established in 43 Tex. Admin. Code § 26.01, *et. seq.* (the "RMA Rules"); and

WHEREAS, prudent management and fiscal oversight are overriding objectives of the CTRMA Board of Directors ("Board"); and

WHEREAS, during the course of the year, CTRMA intends to issue one or more series of revenue bonds for the development of additional projects and to issue refunding bonds as market opportunities arise; and

WHEREAS, it is necessary and desirable to develop and adopt a budget for CTRMA operations for each fiscal year; and

WHEREAS, the Executive Director and staff have developed and recommend that the Board approve the budget for fiscal year 2022-2023 (the "FY 2023 Budget") attached as Exhibit A; and

WHEREAS, the Board has considered adopting a cost-of-living adjustment for retirees receiving a pension as required by Policy Code § 101.0631(b).

NOW THEREFORE, BE IT RESOLVED that the Board hereby approves the FY 2023 Budget attached as Exhibit A; and

BE IT FURTHER RESOLVED that the FY 2023 Budget may be amended from time-to-time by approval of the Board; and

BE IT FURTHER RESOLVED that the Executive Director, or his designee, is hereby authorized to commit funds for non-project related services up to the amounts set forth in the FY 2023 Budget; and

BE IT FURTHER RESOLVED that the Executive Director is directed to provide a copy of this resolution with the attached FY 2023 Budget to Commissioners Courts for Williamson and Travis Counties; and

BE IT FURTHER RESOLVED that, by copy of this resolution, CTRMA hereby provides notice to the Commissioners Courts of Travis County, Texas and Williamson County, Texas of

contemplated revenue bond issuances as required by Section 370.261, Texas Transportation Code.

Adopted by the Board of Directors of the Central Texas Regional Mobility Authority on the 29th day of June 2022.

Submitted and reviewed by: Approved:

_____   _____
James M. Bass   Robert W. Jenkins, Jr.
Executive Director   Chairman, Board of Directors

__Exhibit A__

FY 2023 Budget

(To be provided at the Board Meeting)

Discuss and consider approving Amendment No. 2 to the agreement with Deloitte Consulting, LLP for continued development of the data platform and associated transaction routing and system interfaces to support toll transaction management

Strategic Plan Relevance:	Explore and Invest in Transformative Technology and Adopt Industry Best Practices; Deliver Multi-faceted Mobility Solutions; Invest in Effort that Extends Beyond Roadways
Department:	Operations
Contact:	Greg Mack, Assistance Director of IT & Toll Systems
Associated Costs:	an increase of $257,930 (resulting in a new Not To Exceed amount of $2,327,294)
Funding Source:	183A Phase III Project funds
Action Requested:	Consider and act on draft resolution

Project Background: The Mobility Authority currently uses an outsourced solution developed by Kapsch TrafficCom to handle the end-to-end toll transaction management processes and workflow. To provide more flexibility in the future, in March 2021, the Mobility Authority awarded a contract to Deloitte Consulting LLP (Deloitte) to begin development of the data platform to move to a stratagem wherein all toll transaction processing and data management capabilities after the point of transaction creation is advanced to a Mobility Authority-managed solution. A third-party vendor would continue to collect and create the toll transaction data set at the roadside, then pass the toll transaction data to the data platform within the Mobility Authority's network. The new approach gives the Mobility Authority more control of the data which will lead to better informed decision-making.

Project Description: The objective of the Data Platform System (DPS) is to transition all toll transaction data processing and data management capabilities after the point of

transaction creation to a Mobility Authority-managed solution. Kapsch and ETC, the Authority's lane vendors, will continue to collect and create the toll transaction at the roadside, then pass fully formed toll transaction to the DPS as a central integration point. Business logic and rules will then consume the transaction and route the payment request to either the Central United States Interoperability (CUSIOP) Hub or the Pay by Mail (PBM) vendor.

Development for the first two project releases was completed September 2021 on schedule. These releases created the base code as well as the routing and exchange processes. Release 3 supports development for pricing and billing transactions, defining how data governance is handled in the new processing schema, and identifying the suite of reports necessary to account for the agency's revenue and monitor performance.

Summary of Action Requested: In September 2021 the Board approved a contract with Deloitte Consulting LLP for the development of Release 3. The total amount authorized was $2,069,364 which included a 10% project contingency. Amendment No. 1 was executed in March 2022 removing some project scope and decreasing the total not to exceed amount to $2,015,294.

Additional efforts are required to test the transaction processing workflow from end to end to ensure the DPS is ready to assume these responsibilities. The Statement of Work Amendment No. 2 attachment outlines these efforts. Summarized below are the various pricing changes related to Release 3 and the new scope:

Release 3 Board Approved Not to Exceed Amount	**$2,069,364.00**
Amendment No. 1	($54,070.00)
Revised Not to Exceed Amount	$2,015,294.00
Amendment No. 2	$312,000.00
New Total Project Not to Exceed Amount	$2,327,294.00
Amount Above Initial Board Approval	**$257,930.00**

Staff requests the approval of Amendment No. 2 which will require an increase of $257,930.00 to the not to exceed amount under the Board's previous approval. This funding will allow Deloitte to complete Release 3 and prepare the DPS to assume transaction processing responsibilities.

Previous Actions: The initial contract with Deloitte was awarded by the Mobility Authority's Board of Directors in February 2021; the contract with Deloitte was approved by the Board of Directors in March 2021. A contract for the development of Release 3 was awarded to Deloitte in September 2021. Staff anticipates bringing forth a separate SOW for Release 4 in August 2022.

Financing: 183A Phase III Project funds

Staff Recommendation: Staff recommends amending the contract with Deloitte for additional scope supporting continued development of the data platform and associated transaction routing and system interfaces to support toll transaction management.

Backup provided: Draft Resolution
Data Platform Solution Release 3 SOW – Amendment 2
DPS Release 3 SOW Amendment 2 - Attachment A
DPS Release 3 SOW Amendment 2 - Attachment B
DPS Release 3 SOW Amendment 2 - Attachment C
DPS Release 3 SOW Amendment 2 – Public Records Act Agreement
DIR Vendor Agreement – Deloitte Consulting DPS Release 3 Amendment 2

**GENERAL MEETING OF THE BOARD OF DIRECTORS
OF THE
CENTRAL TEXAS REGIONAL MOBILITY AUTHORITY**

RESOLUTION NO. 22-0XX

**APPROVING AMENDMENT NO 2 TO THE CONTRACT WITH DELOITTE
CONSULTING LLP FOR CONTINUED DEVELOPMENT OF A DATA PLATFORM
AND ASSOCIATED TRANSACTION ROUTING AND SYSTEM INTERFACES TO
SUPPORT TOLL TRANSACTION MANAGEMENT**

WHEREAS, Mobility Authority staff is developing a data platform to transition all toll transaction data processing and data management capabilities after the point of transaction creation from a third-party vendor to the Mobility Authority (the "Data Platform System"); and

WHEREAS, a Mobility Authority managed data platform will support new business capabilities such as external reporting, data analytics and a connection to the Texas Department of Motor Vehicles' datasets to allow better informed agency decision making; and

WHEREAS, by Resolution No. 21-018, dated March 31, 2021, the Board of Directors approved a contract with Deloitte Consulting LLP for the first and second releases of the Data Platform System to establish the data platform and create the routing and exchange processes; and

WHEREAS, by Resolution No. 21-059, dated September 29, 2021, the Board of Directors approved a contract with Deloitte Consulting LLP for the third release of the Data Platform System to support development for pricing and billing transactions, define how data governance is handled in the new processing schema, and identify the suite of reports necessary to account for the Mobility Authority's revenue and monitor performance for an amount not to exceed $2,069,364.00 including ten percent project contingency; and

WHEREAS, on March 14, 2022, the Mobility Authority and Deloitte Consulting LLP executed Amendment No. 1 to the contract to remove a portion of the scope of the third release of the Data Platform System and to reduce the total amount not to exceed to $2,015,294.00; and

WHEREAS, the Executive Director has negotiated Amendment No. 2 to the contract with Deloitte Consulting LLP to ensure the Data Platform System is tested and prepared for transaction processing workflow from end to end, in an amount not to exceed $312,000.00 which is attached hereto as Exhibit A; and

WHEREAS, considering previously approved Amendment No. 1 and proposed Amendment No. 2, the total amount to be paid under the contract with Deloitte Consulting LLP for the third release of the Data Platform System is $2,327,294.

NOW THEREFORE BE IT RESOLVED that the Board of Directors hereby approves Amendment No. 2 to the contract with Deloitte Consulting LLP to ensure the Data Platform System is tested

and prepared for transaction processing workflow from end to end, in an amount not to exceed $312,000.00 which is attached hereto as <u>Exhibit A</u>.

Adopted by the Board of Directors of the Central Texas Regional Mobility Authority on the 29th day of June 2022.

Submitted and reviewed by: Approved:

_____   _____
James M. Bass   Robert W. Jenkins, Jr.
Executive Director   Chairman, Board of Directors

Exhibit A

CENTRAL TEXAS REGIONAL MOBILITY AUTHORITY

AMENDMENT NO. 2 TO DATA PLATFORM SERVICES RELEASE 3 STATEMENT OF WORK

VENDOR AGREEMENT

This Amendment is made to the VENDOR AGREEMENT, dated September 24, 2021 (the Agreement), between **CENTRAL TEXAS REGIONAL MOBILITY AUTHORITY** (CTRMA) AND **DELOITTE CONSULTING LLP** (Deloitte).

The total compensation for this Scope of Work, as amended, represents an increase of $312,000 from the approved amount for Release 3 Amendment 1 for a new total expected amount of $2,139,170. All other terms, conditions and obligations set forth in the Agreement shall remain in full force and effect.

Deloitte must invoice the CTRMA after each Payment Deliverable is accepted. CTRMA will not make partial payments for deliverable milestone subtasks. Payments will be made in accordance with Appendix A of the Contract.

CTRMA anticipates the completion of development for Release 3, inclusive of the effort as defined herein, will result in a fully functional application, capable of receiving and processing transactions in the production environment in accordance with CTRMA business processes and rules. Additional change orders will not be considered unless CTRMA and Deloitte agree to additional scope.

This Amendment is made for the following purpose, consistent with the Project defined in the Agreement:

Additional Deliverables shall be added to the Scope of Work with the following description and delivery acceptance criteria:

- #62: TVL-LVL File Availability for Vendors and Agencies
    - Design, Development, Functional Testing, Production Readiness Testing with CTRMA defined test cases, and integration testing with CTRMA system integrators
    - **Acceptance Criteria**: Successful testing with no major outstanding software, including internal testing with CTRMA and/or CTRMA vendors or external agencies

- #63: CUSIOP Certification Reports
    - HUB Reconciliation Report identified in the Release 3 Report documentation
    - SQL Shell reports for CUSIOP Certification validation
        - CTRMA KTA Toll Invoice Report
        - CTRMA TTA Fee Invoice Report
        - Transaction Reconciliation Detail Report
        - Transaction Reconciliation Summary Report
        - TAG Status Change Report
    - **Acceptance Criteria**: Successful demonstration of each report, data validation, CTRMA ability to successfully generate reports with no major outstanding issues.

- #64: Consume Southeast U.S. Interoperability Hub (SEIOP) Tag Validation List (TVL)
  - Design, Development, Functional Testing, Production Readiness Testing with CTRMA defined use cases.
  - System Integration Testing with SEIOP partner agencies for one week.
  - SEIOP TVL will utilize the same Interface Control Document (ICD) format as the Central U.S. Interoperability (CUSIOP) TVL. *Reference Attachment A.*
  - All possible SEIOP TVL workflow scenarios and reconciliation between the SEIOP and Data Platform System shall be included in development and testing.
  - Design to be reviewed and approved with CTRMA staff and consultants prior to initiation of development.
  - **Acceptance Criteria**: Successful testing with no major outstanding software or user interface defects, including internal testing with CTRMA and SEIOP Hub and/or partner agencies.

- #65: DPS Support Duplicate Transactions
  - Design, Development, Functional Testing, Production Readiness (user) Testing with CTRMA defined use cases.
  - Business rule: BR-505 *Reference Attachment B.*
    - Multiple transactions for the same vehicle shall not be processed, and may consist of the following:
      1. An AVI Transaction and Video Transaction for the same vehicle at the same location, direction, and time (within a configurable threshold (parameter).
      2. Multiple AVI Transactions for the same vehicle at the same location, direction, and time (within a configurable threshold (parameter).
      3. Multiple Video Transactions for the same vehicle at the same location, direction, and time (within a configurable threshold (parameter).
    - DPS Identified duplicates shall be flagged in the database and reportable.
  - CTRMA business rules shall be interpreted for DPS to mean multiple transactions for the same vehicle shall not be processed through the Hub or PBM, but instead put in a final state with a distinct workflow status.
  - **Acceptance Criteria**: Successful testing with CTRMA approved test cases with no major outstanding software or user interface defects.

- #66: Transaction Reporting
  - Discovery sessions, design, and development of transaction reports, including TOMS UI and APIs associated with SQL queries already included in scope for Release 3.
  - Specific reports identified in the Release 3 Report documentation.
    - Report 1: Transaction Search (created in Release 1-2, migrating to Release 3)
    - Report 2: CSC Pending Reconciliation – Summary
    - Report 3: CSC Pending Reconciliation – Detail
    - Report 4: Reconciliation Summary
    - Report 5: PBM Reconciliation Report
    - Report 6: Non-Revenue by Agency
    - Report 7: Transaction Summary
    - Report 8: Pending Workflow Stages Report
  - *Reference Attachment C: Release 3 Report Requirements v1.2.*
  - Selection criteria and report results are detailed in the requirements document.

- o Current reports samples provided in the documentation are not intended to be duplicated but are for reference only.
  - o Design review and approval by CTRMA is required prior to initiation of development.
  - o **Acceptance Criteria**: Successful demonstration of each report in TOMS, data validation, CTRMA ability to successfully generate reports in TOMS with no major outstanding issues.

- #67: Integration Testing: CUSIOP, PBM, ETCS (Kapsch)
  - o DPS-ETCS (Kapsch) Integration Testing, CUSIOP Certification Testing (including Dry-Run testing), DPS-PBM Integration Testing
  - o Load testing and performance testing is included to reach CTRMA processing volume and timing expectations.
  - o Includes resolution of all outstanding issues identified during testing.
  - o **Acceptance Criteria**: Successful completion of all identified test cases with no major outstanding issues.

- #68: End-to-End Production Readiness Testing
  - o Testing and UAT support of End-to-End (E2E) testing with CTRMA provided test cases.
  - o Load testing and performance testing is included to reach CTRMA processing volume and timing expectations.
  - o Includes resolution of all outstanding issues identified during testing and development required based on uncovered requirements or new design/development.
  - o **Acceptance Criteria**: Successful completion of all identified test cases with no major or minor outstanding issues, and all code moved to and verified in the Production Environment.

- #69: DPS-TCS API-Based ICD for RTRAN, ITRAN, IREQ, and HRR
  - o Design, Development of ICD documentation coordinated with new ETCS (ETC) and CTRMA.
  - o Collaborative design is expected with coordinated ETC workshops.
  - o API-Based ICD will be created by Deloitte with review and approval by ETC and CTRMA.
  - o **Acceptance Criteria**: API-Based ICD delivered and approved.

- #70: DPS-TCS API-Based Data Exchanges for RTRAN, ITRAN, IREQ, and HRR
  - o Design, Development, Internal Testing, Production Readiness Testing with CTRMA, and coordinated testing with new ETCS (ETC).
  - o Collaborative design is expected with coordinated ETC workshops.
  - o Coordinate testing with ETC to meet their delivery schedule.
  - o Test Cases will be created by Deloitte with review and approval by ETC and CTRMA.
  - o **Acceptance Criteria**: Successful testing of API-Based data exchanges for RTRAN, ITRAN, IREQ, and HRR.
  - o **Not Included**: Production go-live and post go-live verification; this will be performed under a separate maintenance contract.

Pricing Schedule shall be updated to include the new deliverables as shown:

#	Deliverables	Deliverable Price
Tolling Product Management		
1	Development and deployment of Product database(s) and relationships	$50,055.00
2	Design and development of automated Product Management process(es)	$50,055.00
3	Development of automated business process(es) for payor ID and payment path routing logic	$50,055.00
Discount Management		
4	Development and deployment of Discount database(s) and relationships	$56,355.00
5	Design and development of automated Discount Management process(es)	$78,890.00
6	Integration of Discount Management with Product Management processes	$90,160.00
"Billing" (Invoice) Management		
7	Development and deployment of Invoice database(s) and relationships	$78,890.00
8	Design and development of automated Invoice Management process(es)	$112,700.00
9	Integration of Invoice Management with Product and Discount Management	$112,700.00
Data Exchange Management		
10	Design, development, and testing for Pay by Mail('PBM') Invoice data exchange modifications (Fixed file, API, XML, JSON)	$90,160.00
11	Design, development, and testing for IOP Hub Invoice data exchange modifications (Fixed file, API, XML, JSON)	$90,160.00
Data Governance & SOC 2 Compliance		
20	SOC 2 Risk Objectives, Control Objectives, and Policies	$56,350.00
21	SOC 2 Compliance Processes & Procedures	$56,350.00
22	Support for establishment of Data Governance strategy and approach	$78,890.00
23	Definition of Data Use criteria	$56,350.00
IT Enterprise Management		
28	Policies & Procedures documentation	$56,350.00
29	Revision of Source Data Entity Catalog	$56,350.00
30	Data Platform IT Service Catalog(s) and Service Level definition & documentation	$56,350.00
TOMS		
Product Management		
52	Product Types and Groups: Design and development of UX/UI for Product Management (View List, View Item, Create, Modify, Delete)	$55,000.00
53	Products: Design and development of UX/UI for Product Management (View List, View Item, Create, Modify, Delete)	$66,000.00
54	Pricing (Price Charts): Design and development of UX/UI for Product Management (View List, View Item, Create, Modify, Delete)	$66,000.00
Discount Management		
55	View Exempt Discount: Design and development of UX/UI for Discount Management (View List, View Item, Create, Modify, Delete)	$55,000.00
56	Add/Edit Discount Programs: Design and development of UX/UI for Discount Management (View List, View Item, Create, Modify, Delete)	$44,000.00
57	Organizations: Design and development of UX/UI for Discount Management (View List, View Item, Create, Modify, Delete)	$38,500.00
Billing Management		
58	Manage Billing: Design and development of UX/UI for Billing Management (View List, View Item, Create, Modify, Delete)	$71,500.00
59	Manage Transactions: Design and development of UX/UI for Billing Management (View List, View Item, Create, Modify, Delete)	$60,500.00
Data Exchange Management		
60	Manage File Exchange Report: Design and development of UX/UI for Data Exchange Management (View List, View Item, Create, Modify, Delete)	$66,000.00
61	Manage File Runs: Design and development of UX/UI for Data Exchange Management (View List, View Item, Create, Modify, Delete)	$27,500.00
Additional Effort (Change Order 2)		
62	TVL-LVL File Availability for Vendors and Agencies	$0.00
63	CUSIOP Certification Reports	$0.00
64	Consume SEIOP TVL	$19,500.00
65	DPS Support Duplicate Transactions	$20,800.00
66	Transaction Reporting	$63,700.00
67	Integration Testing: CUSIOP, PBM, ETCS (Kapsch)	$52,000.00
68	End-to-End Production Readiness Testing	$31,200.00
69	DPS-TCD API-Based ICD for RTRAN, ITRAN, IREQ, and HRR	$15,600.00
70	DPS-TCD API-Based Data Exchanges for RTRAN, ITRAN, IREQ, and HRR	$109,200.00
DPS Release 3 Complete Development		$2,139,170.00

IN WITNESS WHEREOF, the parties have caused this Amendment to be executed as of the date signed by the CTRMA and written below.

DELOITTE CONSULTING LLP   **CENTRAL TEXAS REGIONAL**
                                               MOBILITY AUTHORITY

_____   _____
Uday Katira, Managing Director   James M. Bass
Deloitte Consulting LLP   CTRMA Executive Director

_____06/14/2022_____   _____
Date   Date

ATTACHMENT A: NIOP / CUSIOP ICD DOCUMENTATION

- NIOP ICD VERSION 1.02 FINAL RELEASED 20190507
- NIOP ICD Appendix A - RELEASED 20181126
- NIOP ICD Appendix B - RELEASED 20181126
- NIOP ICD Appendix C - RELEASED 20200205
- NIOP ICD Appendix D - RELEASED 20181126
- NIOP ICD Appendix E - RELEASED 20190201
- CUSIOP ICD Supplement CLEAN DISTRIBUTED 20191021

ATTACHMENT B: CTRMA BUSINESS RULES

- The Mobility Authority Business Rules - Lane Systems 1.0 FINAL DRAFT - CLEAN

ATTACHMENT C: REPORT REQUIREMENTS

- Data Platform Release 3 Report Requirements v1.2

DIR Vendor Agreement

This is to signify that the Central Texas Regional Mobility Authority and Deloitte Consulting LLP Corporation have entered into an Agreement **in an amount not to exceed $2,139,170.00** pursuant to Texas Government Code Section 2054.0565 utilizing Texas Department of Information Resources Contract No. #DIR-TSO-4031 for the deliverable-based information technology services described in this proposal. All terms and conditions of Texas Department of Information Resources Contract No. #DIR-TSO-4031 are applicable to and made part of this agreement.

DELOITTE CONSULTING LLP

_____
Uday Katira, Managing Director
Deloitte Consulting LLP

 06/17/2022
_____
Date

CENTRAL TEXAS REGIONAL MOBILITY AUTHORITY

_____
James Bass
Executive Director

_____
Date

ATTACHMENT A: NIOP / CUSIOP ICD DOCUMENTATION

- NIOP ICD VERSION 1.02 FINAL RELEASED 20190507
- NIOP ICD Appendix A - RELEASED 20181126
- NIOP ICD Appendix B - RELEASED 20181126
- NIOP ICD Appendix C - RELEASED 20200205
- NIOP ICD Appendix D - RELEASED 20181126
- NIOP ICD Appendix E - RELEASED 20190201
- CUSIOP ICD Supplement CLEAN DISTRIBUTED 20191021

National Interoperability
Interface Control Document
Version 1.02
FINAL

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<u>Modification History</u>

Date	Version	Modifications
September/ October 2018	NIOP X.XX	1. Conformed the Southern States Interoperability ICD to National Interoperability ICD. 2. Incorporated revisions requested by the NIOP Working group. 　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: 　　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	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: 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	Added Appendix E License Plate Types. Corrected appendix naming convention.
March 2019	NIOP 1.02	Added revised XML examples.
May 2019	NIOP 1.02 FINAL	Removed DRAFT, updated date and made FINAL.

1   Introduction

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

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

The interface data types defined are:

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

2   General Data Requirements

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

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

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

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

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

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

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

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

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

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

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

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

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

2.1 Web Services Guidelines

2.1.1 General Web Services Guidelines

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

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

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

2.1.2 General Exception Handling for Web Services

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

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

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

The following construct defines each of these faults

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

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

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

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

2.2   SFTP File Transfer Guidelines

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

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

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

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

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

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

    Where {env} = PROD or PREPROD

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

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

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

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

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

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

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

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

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

3 Tag Validation List (TVL) Data

3.1 Usage

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

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

3.2 File Name

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

Example: 9002_9002_20171201001015.BTVL

3.3 Data Records/Fields

Tag Validation List Header Record				
Field	**Type**	**Max Length**	**Required/ Optional**	**Description**
Submission Type	Char	4	Required	Defines the type of data in the file. 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 Appendix A for valid values.
Home Agency ID	Char	4	Required	The ID assigned to the Home Agency. This is the agency that manages the customer account to which toll charges may be posted. For consolidated TVLs this is the Home Hub ID. Refer to Appendix A for valid values.

Tag Validation List Header Record				
Field	**Type**	**Max Length**	**Required/ Optional**	**Description**
Bulk Indicator	Char	1	Required	Indicates whether this file is a bulk update (Bulk TVL) or differential update (Differential TVL). Bulk updates shall replace all previously transmitted tag/plate data for the Home Agency ID. Differential updates shall contain all changes since the last Bulk and shall be used to indicate new tag/plate data and/or updates in tag/plate status. 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 Appendix B for valid values. For example, NTTA = 0041.
Tag Agency ID	Char	4	Required	An identifier used by NIOP that corresponds to one or more Region and/or Agency field values read directly from a transponder. The Region/Agency fields encoded in a transponder represent the entity that originally issued the transponder. Refer to Appendix C, NIOP Tag Agency ID column for valid values and how they map to actual data encoded on the transponder.
Tag Serial Number	Char	10	Required	Serial Number that may be read from the transponder. Leading zeroes included. 10 decimal digits 0 – 9 converted to a character field.
Tag Status	Char	1	Required	Tag Status. 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). 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.
For each Discount Type, there would be an array with the following fields:				

Tag Validation List Detail Record				
Field	**Type**	**Max Length**	**Required/ Optional**	**Description**
Discount Plans	Char	12	Optional	An array of Regional or NIOP supported discount plans associated with the transponder. Would also be used to support cross agency non-revenue status. Discount Plans are currently not supported. The definition for this data element will be provided when support for it becomes necessary and/or is defined by NIOP.
Discount Plan Start Date	Date/Time	20	Optional	Discount Plan start date (UTC).
Discount Plan End Date	Date/Time	20	Optional	Discount Plan end date (UTC).
Tag Type	Char	1	Optional	Type of transponder. If not specified, standard windshield mounted tag is assumed. Values: S – Switchable L – License Plate F – Feedback G - Feedback and Switchable
Tag Class	Num	4	Required	The number of axles associated with the tag. Default to "2" axle when not available. Values 2-15. 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 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 "-" – Used for 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	Standard Postal Service State abbreviation (or Province abbreviation for Canada). For Mexico, this field would contain MX.
				Values:
				
				Publication 28, Appendix B – US State abbreviations
				    http://pe.usps.com/text/pub28/28apb.htm
				Publication 28, Appendix A.A32 – Canadian Province abbreviations
				    http://pe.usps.com/text/pub28/28apa_005.htm
				"GS" – Used for plates issued by any Federal agency.
				"-" – Used for plates not in the referenced documentation.
				
				If a License Plate Number is provided, the License Plate State must be provided.

License Plate Number	Char	15	Optional	Plate letters/numbers. Shall follow format required for DMV lookups including required prefixes, suffixes, or handling of special characters as dictated by the state which issued the plate.
License Plate Type	Char	30	Optional	Plate type as required for DMV lookups. If Home Agency provides License Plate Type, Away Agency must match to that License Plate Type and must include License Plate Type in any plate based transactions.

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

3.4   XML Definition

TagValidationList_1
1152018.xml

3.5   Processing Requirements

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

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

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

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

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

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

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

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

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

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

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

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

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

3.6   Sample Submission

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

TagValidationListSample_11192018.xml

4 Transaction Data

4.1 Usage

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

4.2 Data Records/Fields

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

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

				Transaction Data Detail Record
Field	**Type**	**Max Length**	**Required/ Optional**	**Description**
Entry Plaza	Char	15	Required for TC and VC transactions	Unique (for the Facility ID) identifier of the plaza on the facility at which the vehicle entered the facility. For Barrier type transactions, this is unused. For Unmatched type transactions, this may be the inferred information.
Entry Plaza Description	Char	30	Required for TC and VC transactions	The entry plaza description that corresponds to the Entry Plaza. To be used for customer statements as necessary by the Home agency. For Barrier type transactions, this is unused. For Unmatched type transactions, this may be inferred information.
Entry Lane	Char	4	Required for TC and VC transactions	Lane identifier at which the vehicle entered the facility. For Barrier type transactions, this is unused. For Unmatched type transactions, this may be inferred information.
Tag Agency ID	Char	4	Required	An identifier used by NIOP that corresponds to one or more Region and/or Agency field values read directly from a transponder. The Region/Agency fields encoded in a transponder represent the entity that originally issued the transponder. Refer to Appendix C, NIOP Tag Agency ID column for valid values and how they map to actual data encoded on the transponder. If the TVL is used to look-up license plate information for a video transaction, the Tag Agency ID, Tag Serial Number, and Tag Status shall be populated by the Away Agency. Refer to Appendix C for valid values.
Tag Serial Number	Char	10	Required	Serial Number as read from the transponder. Leading zeroes included. 10 decimal digits 0 – 9 converted to a character field. If the TVL is used to look-up license plate information for a video transaction, the Tag Agency ID, Tag Serial Number, and Tag Status shall be populated by the Away Agency.

Tag Status	Char	1	Required	Tag Status associated with the Exit Date/Time as determined by the Away Agency from the then active TVL. If the TVL is used to look-up license plate information for a video transaction, the Tag Agency ID, Tag Serial Number, and Tag Status shall be populated by the Away Agency.
				
				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+

Vehicle Classification	Char	4	Optional	Classification of the vehicle based on the Away Agency's classification structure/rules and used to calculate the Toll Amount. This field does not require validation by the Home Agency.
Toll Amount	Num	9	Required	Toll amount in Cents.

Transaction Data Detail Record				
Field	**Type**	**Max Length**	**Required/ Optional**	**Description**
Discount Plan	Char	12	Optional	The discount plan, if any, as determined by the Away Agency that was applicable when calculating the Toll Amount. Used by the Home Agency, if necessary, on the customer statement. Must match to a valid Discount Plan from the TVL for this tag/plate. 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
				  "-" – Used for 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)	Issuing jurisdiction of the license plate as determined by the Away agency and matched to the Home agency data from the TVL.
				
				Values:
				  Publication 28, Appendix B – US State abbreviations
				      http://pe.usps.com/text/pub28/28apb.htm
				  Publication 28, Appendix A.A32 – Canadian Province abbreviations
				      http://pe.usps.com/text/pub28/28apa_005.htm
				  "GS" – Used for plates issued by any Federal agency.
				  "-" – Used for plates not in the referenced documentation.
				
				If a License Plate Number is provided, the License Plate State must be provided.

License Plate Number	Char	15	Required (only for V transactions)	License Plate Number as determined by the Away Agency and matched to the Home Agency data from the TVL.
License Plate Type	Char	30	Optional (only for V transactions)	License Plate Type as determined by the Away Agency and matched to the Home Agency data from the TVL. If the TVL did not contain a plate type, then it is should not be included.
Vehicle Classification Adjustment Flag	Char	1	Optional	Used to indicate if the Vehicle Classification presented in the transaction was adjusted by the Away Agency as compared to the TVL tag classification. Allows the Home Agency to include a statement notice, if applicable, indicating that the tag classification was adjusted or to track mismatch frequency. 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).

Transaction Data Detail Record				
Field	**Type**	**Max Length**	**Required/ Optional**	**Description**
System Matched Flag	Char	1	Optional	0 = System did not force (system) match the entry and exit transaction. 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.
Spare 2	Char	20	Optional	Spare field for future growth. Defined by the CUSIOP Hub as the Activation Date and Time of the TVL used to determine the Guaranteed Flag. This field should be in a Date/Time (UTC) format.
Spare 3	Char	20	Optional	Spare field for future growth.
Spare 4	Char	20	Optional	Spare field for future growth.
Spare 5	Char	20	Optional	Spare field for future growth.
Exit Date/Time w/TZ	Char	25	Required	The date/time with TZ the vehicle exited the facility. For Barrier type transactions, this is the date/time the vehicle used the facility. For Unmatched type transactions, this may be inferred information. 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

4.3   XML Definition

TransactionData_11 152018.xml

4.4   Processing Requirements

N/A

4.5   Sample Submission

TransactionDataSa mple_03182019.xml

5   Adjustment/Correction Data

5.1   Usage

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

5.2   Data Records/Fields

Adjustment/Correction Data Header Record				
Field	**Type**	**Max Length**	**Required/ Optional**	**Description**
Submission Type	Char	5	Required	Defines the type of data in the submission or web service request. Value: SCORR
Submission Date/Time	Date/Time	20	Required	The date/time (UTC) the submission was created or web service request was submitted.
NIOP Hub ID	Char	4	Required	The ID assigned to the Away Hub when transmitting Correction Data from the Away Hub to the Home Hub. Refer to Appendix A for valid values.
Away Agency ID	Char	4	Required	The Agency ID of the Away Agency. This is the agency on whose facility the transaction took place. Refer to Appendix B for valid values.
Home Agency ID	Char	4	Required	The Agency ID of the Home Agency. This is the Home Agency ID assigned where the Correction Data will be sent. 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 Appendix A and B for valid values.

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

Adjustment/Correction Data Detail Record				
Field	**Type**	**Max Length**	**Required/ Optional**	**Comment**
Record Type	Char	5	Required	Record Type being adjusted. 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
Correction Date/Time	Date/Time	20	Optional	The date and time (UTC) the adjustment was made by the Away Agency. Required for adjustments. Not required for transaction resubmittals.

Adjustment/Correction Data Detail Record				
Field	Type	Max Length	Required/ Optional	Comment
Correction Reason	Char	1	Optional (Adjustment Reason or Resubmit Reason must be populated; if an adjustment is resubmitted, both must be populated)	The reason for the adjustment. 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. O – Other adjustment/correction. Apply fields from this record. New toll may be equal to or lower than the original toll amount. For adjustments where the original transaction is required to be backed out, an "I" must be sent by the Visited Agency before a "C", "L", "T" or "O".
Resubmit Reason	Char	1	Optional (Adjustment Reason or Resubmit Reason must be populated; if an adjustment is resubmitted, both must be populated)	The reason for the resubmitted transaction or adjustment: Values: 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".
Other Correction Description	Char	255	Required for Adjustment Reason O only	Free form field used by the Away Agency to indicate further details for Adjustment Reason O (Other).
Correction Count	Num	3	Required	An incrementing sequence number for each adjustment of a Transaction identified by its specific Transaction Reference ID. Values: 1 – 999
Resubmit Count	Num	3	Required	Incremented every time a transaction or adjustment is resubmitted; This should be 0 the first time an adjustment (Correction Data) is transmitted.
Home Agency Reference ID	Num	20	Optional	Reference ID provided by the Home Agency within the Reconciliation Submission for either the original transaction or the most recent adjustment/correction.
All other fields from the Transaction Data Detail				All fields from the original transaction detail (refer to Transaction Data structure for details) will be retransmitted with the appropriate fields corrected to their required values. Notes: 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.

5.3 XML Definition

CorrectionData_111
52018.xml

5.4 Processing Requirements

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

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

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

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

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

5.5 Sample Submission

CorrectionDataSam
ple_03182019.xml

6 Reconciliation Data

6.1 Usage

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

6.2 Data Records/Fields

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

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

Reconciliation Data Detail Record				
Field	**Type**	**Max Length**	**Required/ Optional**	**Comment**
Adjustment Count	Num	3	Required	The incrementing sequence number for each adjustment of a Transaction identified by its specific Transaction Reference ID. For original Transactions, this field would contain zero (0). Values: 0 – 999
Resubmit Count	Num	3	Required	Incremented every time a transaction or adjustment is resubmitted; This should be 0 the first time a transaction or adjustment is transmitted.
Reconciliation Home Agency ID	Char	4	Required	The ID assigned to the Home Agency to which the Transaction Data or Correction Data was sent and who responded with the posting disposition. Refer to Appendix B for valid values.
Home Agency Reference ID	Num	20	Optional	The unique reference ID created by the Home Agency for this transaction as a result of posting the transaction to a customer account.
Posting Disposition	Char	1	Required	The processing disposition for the transaction by the Home Agency. Values indicating Home will pay Away: P – Posted successfully or accepted. The transaction was accepted by the Home Agency. Values indicating the transaction was rejected and no funds are due to the Away Agency: D – Duplicate transaction. Includes exact duplicates as well as duplicates determined by the Home Agency based on its business rule logic. Cannot be resubmitted. I – Invalid Tag/Plate (tag/plate was communicated as invalid and should not have been sent in the first place). Cannot be resubmitted. N – Not posted. Transaction was received after the guarantee period or the Tag Status was Zero/Negative Balance and the account had insufficient funds. Can be resubmitted by the Away Agency /Hub if the account is determined as having sufficient funds (based on the most recent Tag Validation List). S – System or communication issue prevents receiving the Posting Disposition from the Home Agency within the Home Agency Performance SLA for Interoperable transaction processing. The Away Agency can resubmit with the same Transaction Reference ID and the Home Agency will process the transaction considering the original submission date and applicable guarantee. T – Transaction content/format error. Transaction could be corrected and resubmitted with the same Transaction Reference ID. C – Tag/plate not on file. Cannot be resubmitted. O – Transaction too old. Cannot be resubmitted.

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

6.3   XML Definition

ReconciliationData.
xml

6.4   Processing Requirements

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

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

6.5   Sample Submission

ReconciliationData
Sample_10112016_sr

7 Acknowledgement Data

7.1 Usage

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

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

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

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

7.2 File Data Exchange over SFTP

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

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

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

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

7.3 Data Exchange using Web Services over VPN

Provider: Hub which sent a web service request

Consumer: Hub which received a web service request

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

Operation: Synchronous Request-Response.

Format: WSDL

7.4   Data Record/Fields

Acknowledgement Data Detail Record				
Field	**Type**	**Max Length**	**Required/ Optional**	**Comment**
Submission Type	Char	3	Required	Defines the type of data in the file or web service request. 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 Appendix A for valid values.
From Agency ID	Char	4	Required	The Agency/Hub generating the acknowledgement. Refer to Appendix A and B for valid values.
To Agency ID	Char	4	Required	The Agency/Hub that originated the file or submission being acknowledged. Refer to Appendix A and B for valid values.
ACK Date/Time	Date/Time	20	Required	The acknowledgement date/time (UTC); or in case of Return Code 13, the Reconciliation Date/Time; or in the case of Return Code 10, the Activation Date/Time.

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

7.5   XML Definition

Acknowledgement.
xml

7.6   Processing Requirements

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

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

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

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

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

7.7   Sample Submission

AcknowledgementSa
mple.xml

Appendix A: NIOP Hub IDs

The NIOP Hubs are assigned a numeric ID value. These values are listed in 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 Uapdate 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.

Date	Modifications
18-Oct-18	B. Jewell: Created from ICD.
11/25/2018	B. Jewell: Updated abbreviations to conform with the Business Rules.
11/26/2018	B. Jewell: Updated the following as suggested by M. Kolb a. Changed "E-Zpass" to "E-ZPass". b. Changed "Western US Hub" to "Western Region Hub".

NIOP Hub ID	Hub Description
9001	Southeast US Hub (SEIOP)
9002	Central US Hub (CUSIOP)
9003	Northeast (E-ZPass) Hub (EZIOP)
9004	Western Regiion Hub (WRIOP)

Date	Modifications
10/18/2018	B. Jewell: Created from ICD.
11/8/2018	B. Jewell, M. Kolb: Added and populated Home and Away Agency columns and Notes.
11/25/2018	B. Jewell: Accepted revisions from R. Carrier.

NIOP Agency ID	Assigned NIOP Hub	Home Agency	Away Agency	Agency Description	Note
0017	9001	X	X	South Carolina DOT (SCDOT)	
0033	9001	X	X	North Carolina Turnpike Authority (NCTA)	
0034	9001	X	X	Georgia State Road and Tollway Authority (SRTA)	
0035	9001	X	X	Florida Turnpike Enterprise (FTE)	
0036	9001	X	X	Central Florida Expressway Authority (CFX)	
0037	9001		X	Miami Dade Expressway Authority (MDX)	
0038	9001		X	Tampa Hillsborough Expressway Authority (THEA)	
0039	9001	X	X	Lee County Florida	
0062	9001		X	Southern Connector SC	
0040	9002	X	X	Texas DOT (TxDOT)	
0041	9002	X	X	North Texas Tollway Authority (NTTA)	
0042	9002	X	X	Harris County Toll Road Authority (HCTRA)	
0043	9002		X	Central TX Regional Mobility Authority (CTRMA)	
0046	9002	X	X	E-470 Colorado	
0047	9002		X	Northwest Parkway Colorado	
0050	9002			Greater New Orleans Expressway Commission (Lake Pontchartrain Causeway)	
0051	9002			Louisiana DOT and Development (LADOTD)	
0055	9002	X	X	Oklahoma Turnpike Authority	
0056	9002	X	X	Kansas Turnpike Authority	
0070	9002		X	Ft. Bend County Toll Road Authority	
0002	9003		X	New Jersey Highway Authority (NJHA)	
0003	9003		X	New Jersey Turnpike Authority (NJTA)	
0004	9003	X	X	New York State Thruway Authority (NYSTA)	
0005	9003	X	X	Port Authority of New York & New Jersey (PANYNJ)	
0006	9003	X	X	Pennsylvania Turnpike Commission (PTC)	
0007	9003		X	South Jersey Transportation Authority (SJTA)	
0008	9003	X	X	MTA Bridges & Tunnels (MTAB&T)	
0009	9003		X	Delaware River Port Authority (DRPA)	
0010	9003	X	X	Virginia DOT (VDOT)	
0013	9003		X	Peace Bridge, New York	
0015	9003	X	X	Illinois State Toll Highway Authority (ISTHA)	
0016	9003	X	X	Maryland Transportation Authority (MdTA)	
0018	9003		X	New York State Bridge Authority (NYSBA)	
0019	9003	X	X	Delaware DOT (DelDOT)	
0021	9003	X	X	Massachusetts DOT (MassDOT)	
0022	9003	X		New Jersey CSC (NJCSC)	
0024	9003	X	X	West Virginia Parkways Authority (WVPA)	
0025	9003		X	Delaware River and Bay Authority (DRBA)	
0026	9003	X	X	New Hampshire DOT (NHDOT)	
0027	9003		X	Burlington County Bridge Commission (BCBC)	
0028	9003	X	X	Maine Turnpike Authority (MeTA)	
0029	9003		X	Delaware River Joint Toll Bridge Commission (DRJTBC)	
0030	9003	X	X	Indiana Toll Road Concession Company (ITRCC)	
0031	9003	X	X	Ohio Turnpike and Infrastructure Commission (OTIC)	
0032	9003	X	X	Rhode Island Turnpike and Bridge Authority (RITBA)	
0044	9003	X	X	Skyway Concession Company (SCC)	
0045	9003	X	X	Louisville-Southern Indiana Ohio River Bridges (LSIORB)	
0048	9003			Minnesota DOT (MnDOT)	
0049	9003			Blue Water Bridge	
0059	9003		X	Niagara Falls Bridge Commission	
0060	9003		X	Thousand Islands Bridge Authority	
0058	9004	X	X	Utah DOT (UDOT)	
0077	9004	X	X	Washington DOT (WashDOT)	
0101	9004	X	X	Bay Area Toll Authority (BATA)	
0103	9004	X	X	Transportation Corridor Agencies (TCA)	
0105	9004		X	Golden Gate Bridge, Highway and Transportation District (GGBHTD)	
0106	9004	X	X	Los Angeles County Metropolitan Transportation Authority (LA Metro)	
0107	9004	X	X	Orange County Transportation Authority (OCTA)	
0108	9004	X	X	Riverside County Transportation Commission (RCTC)	
0109	9004	X	X	San Diego Association of Governments (SANDAG)	
0110	9004		X	Santa Clara Valley Transportation Authority (VTA)	
0111	9004		X	South Bay Expressway, LLC (SBX)	
0112	9004		X	Alameda County Transportation Commission (ACTC)	
0113	9004		X	San Francisco County Transportation Authority (SFCTA)	
0114	9004		X	San Bernardino County Transportation Authority (SBCTA)	
0116	9004	X	X	Port of Hood River (PoHR)	
0011				Highway 407, Canada	Has not indicated they are doing NIOP.
0014				Ambassador Bridge, Michigan	Has not indicated they are doing NIOP.
0054				Capufe, Mexico	Has not indicated they are doing NIOP.
0057				Puerto Rico Highway and Transportation Authority	Has not indicated they are doing NIOP.
0061				Halifax Dartmouth Bridge Commission	Has not indicated they are doing NIOP.
0066				TI Corp (Canada)	Has not indicated they are doing NIOP.
0115				Concession A25 S.E.C.	Has not indicated they are doing NIOP.
0118				McAllen-Hidalgo & Anzalduas Bridges	Has not indicated they are doing NIOP.
n/a				New Brunswick (Canada) Highway Corporation	Has not indicated they are doing NIOP.

Date	Modifications
18-Oct-18	B. Jewell: Created from ICD.
11/25/2018	B. Jewell: Accepted revisions from R. Carrier.
11/26/2018	B. Jewell: Made the following revisions as suggested by M. Kolb. a. NIOP Tag Agency ID 127 – Removed. The cell should be blank since these are not 6C transponders and this might cause confusion in the future. b.General Note B - Removed. c. General Note C - Removed. d. General Note E - changed "NIOP/SSIOP HUB (Tvl) Tag Agency ID" to "NIOP Tag Agency ID" and changed "EZG Hub" to "EZIOP Hub". Updated references.
12/18/2018	M. Kolb: Made the following revisions: a. NIOP Tag Agency ID 0050 - added Native 6C ID 451. b. Added NIOP Tag Agency ID value of 0062 to Southern Connector (was previously n/a). c. Added NIOP Tag Agency ID values 0119, 0120, 0121, 0122, 0124, 0125 d. Added Native 6C ID 2306
1/15/2019	B. Jewell: Updated based on email from Bill Brownsburger on behalf of SRTA, as follows: SRTA would like to update their agency ID listings in the NIOP Appendix C listing of tag agency IDs. SRTA has already been assigned two tag agency IDs: 034 and 063. In the table, 034 was identified to be used for their SeGo tags (which haven't been issued for several years but are still on the road) and 063 for their 6C (which are the only tags SRTA currently issues). SRTA's 6C tags are their main tag population at this point. SRTA has been using agency ID 034 for all of their Southeast hub communications, and would prefer to keep this as their 'primary' tag Agency ID, to be used for their 6C tags. So the change essentially amounts to changing 034 to be their 6C tags and 063 to be their SeGo tags. This will not affect currently-implemented systems at all, as 034 is the only tag agency ID currently in use.
5/30/2019	M. Kolb: Made the following revisions: a. Added Native TDM IDs 120 and 125 b. Added NIOP Tag Agency ID value of 0102
10/17/2019	M. Kolb: Made the following revisions: Added NIOP Tag Agency IDs 0070, 0071, 0099 and 0126 Assigned NIOP Tag Agency ID 0080
11/22/2019	B. Jewell: Made the following revision from B. Brownsburger: I'd like to get the Native 6C ID field (column E) for SRTA's 0034 agency code updated with the agency ID that's actually programmed into SRTA's 6C tags. That ID is decimal 321 (hex 141).
2/5/2020	B. Jewell: Corrected Tag Agency ID 1101. Changed back from HCTRA to TxDOT.

NIOP Tag Agency ID	Native ETC Program	Protocols	Native TDM ID	Native 6C ID	Native SeGo ID	ATA	Reserved EZG Agency ID	State	Original Issuing Agency	Note
0002	E-ZPass	TDM	2				002	NJ	New Jersey Highway Authority (NJHA)	
0003	E-ZPass	TDM	3				003	NJ	New Jersey Turnpike Authority (NJTA)	
0004	E-ZPass	TDM	4				004	NY	New York State Thruway Authority (NYSTA)	
0005	E-ZPass	TDM	5				005	NY	Port Authority of New York & New Jersey (PANYNJ)	
0006	E-ZPass	TDM	6				006	PA	Pennsylvania Turnpike Commission (PTC)	
0007	E-ZPass	TDM	7				007	NJ	South Jersey Transportation Authority (SJTA)	
0008	E-ZPass	TDM	8				008	NY	MTA Bridges & Tunnels (MTAB&T)	
0009	E-ZPass	TDM	9				009	NJ	Delaware River Port Authority (DRPA)	
0010	E-ZPass	TDM	10				010	VA	Virginia DOT (VDOT)	
0011	407ETR	TDM	11			;	011	Canada	Highway 407, Canada	
0013	E-ZPass	TDM	13				013	NY	Peace Bridge, New York	
0014	A-Pass	TDM	14				014	MI	Ambassador Bridge, Michigan	Believe that they currently use 6C transponders.
0015	E-ZPass	TDM	15				015	IL	Illinois State Toll Highway Authority (ISTHA)	
0016	E-ZPass	TDM	16				016	MD	Maryland Transportation Authority (MdTA)	
0017	Palmetto Pass	TDM/SeGo	17		2568 (0x0A08)		017	SC	South Carolina DOT (SCDOT)	Issues dual protocol transponders.
0018	E-ZPass	TDM	18				018	NY	New York State Bridge Authority (NYSBA)	Does not currently issue its own transponders.
0019	E-ZPass	TDM	19				019	DE	Delaware DOT (DelDOT)	
0021	E-ZPass	TDM	21				021	MA	Massachusetts DOT (MassDOT)	
0022	E-ZPass	TDM	22				022	NJ	New Jersey CSC (NJCSC)	
0024	E-ZPass	TDM	24				024	WV	West Virginia Parkways Authority (WVPA)	
0025	E-ZPass	TDM	25				025	NJ	Delaware River and Bay Authority (DRBA)	
0026	E-ZPass	TDM	26				026	NH	New Hampshire DOT (NHDOT)	
0027	E-ZPass	TDM	27				027	NJ	Burlington County Bridge Commission (BCBC)	Does not currently issue its own transponders.
0028	E-ZPass	TDM	28				028	ME	Maine Turnpike Authority (MeTA)	
0029	E-ZPass	TDM	29				029	NJ	Delaware River Joint Toll Bridge Commission (DRJTBC)	
0030	E-ZPass	TDM	30				030	IN	Indiana Toll Road Concession Company (ITRCC)	
0031	E-ZPass	TDM	31				031	OH	Ohio Turnpike and Infrastructure Commission (OTIC)	
0032	E-ZPass	TDM	32				032	RI	Rhode Island Turnpike and Bridge Authority (RITBA)	
0033	Quick Pass	TDM/6C/SeGo	33	33	2567 (0x0A07)	NCTA	033	NC	North Carolina Turnpike Authority (NCTA)	NCTA segregates protocols by serial number range. As such, all three protocols can be mapped to a single Agency ID without the risk of overlapping.
0034	Peach Pass	6C		321 (hex 141)		GSTA	034	GA	Georgia State Road and Tollway Authority (SRTA)	For their 6C transponders. See ID 063 for their SeGo transponders.

NIOP Tag Agency ID	Native ETC Program	Protocols	Native TDM ID	Native 6C ID	Native SeGo ID	ATA	Reserved EZG Agency ID	State	Original Issuing Agency	Note
0035	SunPass	SeGo			2561 (0x0A01)	FDOT	035	FL	Florida Turnpike Enterprise (FTE)	The CRC in the FTE tag is formatted differently than most others.
0036	E Pass	TDM/SeGo	36		2565 (0x0A05)		036	FL	Central Florida Expressway Authority (CFX)	CFX segregates protocols by serial number range. As such, both protocols can be mapped to a single Agency ID without the risk of overlapping.
0039	LeeWay	SeGo			2563 (0x0A03)		039	FL	Lee County Florida	
0044	E-ZPass	TDM					044	IL	Skyway Concession Company (SCC)	
0045	RiverLink	TDM/6C	45	449			045	KY	Louisville-Southern Indiana Ohio River Bridges (LSIORB)	LSIORB segregates protocols by serial number range. As such, both protocols can be mapped to a single Agency ID without the risk of overlapping.
0046	ExpressToll	6C		194			046	CO	E-470 Colorado	
0048	MnPass				2569 (0x0A09)		048	MN	Minnesota DOT (MnDOT)	
0049	?	6C		2529			049	MI	Blue Water Bridge	
0050	TollTag	6C/SeGo		451	50 (0x0032)	LPC.	050	LA	Greater New Orleans Expressway Commission (Lake Pontchartrain Causeway)	GNOEC tag ID is formatted a little different than others. They do not have a CRC and their ID is in the space where the CRC generally is. In addition, they segregate protocols by serial number. As such, both protocols can be mapped to a single Agency ID without the risk of overlapping.
0051	GeauxPass	6C/SeGo		450	51 (0x0033)	GNO2	051	LA	Louisiana DOT and Development (LADOTD)	LADOTD segregates protocols by serial number range. As such, both protocols can be mapped to a single Agency ID without the risk of overlapping.
0054	IAVE Pass	SeGo			203 (0x00CB)	CPFI	054	Mexico	Capufe, Mexico	Believe they may have migrated to 6C.
0057	AutoExpreso	6C		448			057	PR	Puerto Rico Highway and Transportation Authority	
0058	Express Pass	6C		1409			058	UT	Utah DOT	
0059		TDM	59				059	NY	Niagara Falls Bridge Commission	Does not currently issue its own transponders.
0060		TDM	60				060	NY	Thousand Islands Bridge Authority	Does not currently issue its own transponders.
0061	MACPASS	SeGo			197 (0x00C5)	CAHD	061	Canada	Halifax Dartmouth Bridge Commission	
0062		6C/TDM	n/a	62			062	SC	Southern Connector SC	
0063	Peach Pass	SeGo			200 (0x00C8)		063	GA	Georgia State Road and Tollway Authority (SRTA)	For their SeGo transponders. See ID 034 for their 6C transponders.
0064	SunPass	SeGo			2570 (0x0A0A)		064	FL	Florida Turnpike Enterprise (FTE)	Second ID assigned to FTE.
0065	SunPass	SeGo			2571 (0x0A0B)		065	FL	Florida Turnpike Enterprise (FTE)	Third ID assigned to FTE.
0066	TReO	6C		2305			066	Canada	TI Corp (Canada)	
0070		6C		70			070	AL	American Roads (AR)	
0071		6C		71			071	MI	Detroit Windsor Tunnel (DWT)	
0077	Good To Go	6C/SeGo		77 / 78	218 (0x00DA)		077	WA	Washington DOT (WashDOT)	WashDOT segregates protocols by serial number range and has also segregated its Agency ID 77 and 78 transponders by serial number range. As such, both protocols and all the current Agency IDs can be mapped to a single Agency ID without the risk of overlapping.
0080	E-ZPass	TDM	80				080		Cline Avenue Bridge LLC	
0081							081		Reserved for future E-ZPass expansion	
0082							082		Reserved for future E-ZPass expansion	

NIOP Tag Agency ID	Native ETC Program	Protocols	Native TDM ID	Native 6C ID	Native SeGo ID	ATA	Reserved EZG Agency ID	State	Original Issuing Agency	Note
0083							083		Reserved for future E-ZPass expansion	
0084							084		Reserved for future E-ZPass expansion	
0085							085		Reserved for future E-ZPass expansion	
0086							086		Reserved for future E-ZPass expansion	
0087							087		Reserved for future E-ZPass expansion	
0088							088		Reserved for future E-ZPass expansion	
0089							089		Reserved for future E-ZPass expansion	
0090							090		Reserved for future E-ZPass expansion	
0091							091		Reserved for future E-ZPass expansion	
0092							092		Reserved for future E-ZPass expansion	
0093							093		Reserved for future E-ZPass expansion	
0094							094		Reserved for future E-ZPass expansion	
0095							095		Reserved for future E-ZPass expansion	
0096							096		Reserved for future E-ZPass expansion	
0097							097		Reserved for future E-ZPass expansion	
0098							098		Reserved for future E-ZPass expansion	
0099	E Pass	TDM/SeGo	99		2659 (0x0A63)		099	FL	Central Florida Expressway Authority (CFX)	Second ID assigned to CFX.
0100							100		Reserved for future E-ZPass expansion	
0101	FasTrak	6C		101			101	CA	Bay Area Toll Authority (BATA)	
0102		6C		102			102	Canada	Atlantic Highway Management Corporation Limited (AHMCL)	
0103	FasTrak	6C		103			103	CA	Transportation Corridor Agencies (TCA)	
0106	FasTrak	6C		106			106	CA	Los Angeles County Metropolitan Transportation Authority (LA Metro)	
0107	FasTrak	6C		107			107	CA	Orange County Transportation Authority (OCTA)	
0108	FasTrak	6C		108			108	CA	Riverside County Transportation Commission (RCTC)	
0109	FasTrak	6C		109			109	CA	San Diego Association of Governments (SANDAG)	

NIOP Tag Agency ID	Native ETC Program	Protocols	Native TDM ID	Native 6C ID	Native SeGo ID	ATA	Reserved EZG Agency ID	State	Original Issuing Agency	Note
0115	A25	6C		115			115	Canada	Concession A25 S.E.C.	A25 segregates protocols by serial number range. As such, both protocols can be mapped to a single Agency ID without the risk of overlapping.
0116	BreezeBy	6C		116	220 (0x00DC)		116	OR	Port of Hood River (PoHR)	Open question on their old SeGo transponders and whether there is serial number overlap with their 6C transponders.
0118	EZ Cross	6C		118			118	TX	McAllen-Hidalgo & Anzalduas Bridges	
0119		6C		119			119	TX	Pharr-Reynosa International Bridge	
0120		6C	120	120			120	n/a	TransCore	
0121		6C		121			121	TX	Cameron County Regional Mobility Authority (CCRMA)	
0122		6C		122			122	TX	Starr County	
0124		6C		124			124	MI	Mackinac Bridge Authority	
0125		6C	125	125			125	n/a	BestPass	
0126		6C		126			126	n/a	Kapsch	
0127	FasTrak	Title-21					127	CA	WRIOP (WRIOP Hub) - For Title 21 Tags	The Western Region IOP (WRIOP) will include Title 21 Tags with converted serial numbers to map to eight (8) characters in an interim until Regions are able to accept more than eight (8) characters.
1100	TxTAG	SeGo			21550 (0x542E)	TEX.	040	TX	Texas DOT (TxDOT)	
1101	TxTAG	SeGo			102 (0x0066)	TXDT	067	TX	Texas DOT (TxDOT)	2/2020: Changed from HCTRA back to TxDOT.
1110	TollTag	SeGo			20052 (0x4E54)	DNT.	041	TX	North Texas Tollway Authority (NTTA)	
1111	TollTag	SeGo			182 (0x00B6)	DFW.	053	TX	NTTA / DFW	
1112	TollTag	SeGo			TBD		069	TX	NTTA	Additional ID assigned to NTTA.
1120	EZ Tag	SeGo			100 (0x0064)	HCTR	042	TX	Harris County Toll Road Authority (HCTRA)	
1121	EZ Tag	SeGo			222 (0x00DE)	MTAH	068	TX	HCTRA / Houston Metro	
1130		SeGo			n/a	n/a	043	TX	Central TX Regional Mobility Authority (CTRMA)	Does not issue its own transponders.
1131		SeGo			n/a		052	TX	Ft. Bend County Toll Road Authority	Does not issue its own transponders.
1250	PikePass	SeGo			20299 (0x4F4B)	OTA.	055	OK	Oklahoma Turnpike Authority	
1300	K Tag	SeGo			19284 (0x4B54)	KTA.	056	KS	Kansas Turnpike Authority	
n/a		n/a	n/a				000	n/a	Reserved - Manufacturer (Kapsch)	
n/a		n/a	n/a				001	n/a	Reserved	
n/a		n/a					012	FL	MetroDade, Florida	No longer issues transponders.
n/a		TDM	n/a				020	n/a	Advantage I-75	Not sure they still issue transponders. Were never reciprocal.
n/a			n/a				023	Canada	New Brunswick (Canada) Highway Corporation	Do not believe they ever actually issued any transponders.
n/a		SeGo			n/a		037	FL	Miami Dade Expressway Authority (MDX)	Does not issue its own transponders.
n/a		SeGo			n/a		038	FL	Tampa Hillsborough Expressway Authority (THEA)	Does not issue its own transponders.
n/a		6C		n/a			047	CO	Northwest Parkway Colorado	Does not issue its own transponders.
n/a		6C		104			104	CA	California Department of Transportation (Caltrans)	Does not issue its own transponders.

NIOP Tag Agency ID	Native ETC Program	Protocols	Native TDM ID	Native 6C ID	Native SeGo ID	ATA	Reserved EZG Agency ID	State	Original Issuing Agency	Note
n/a		6C		105			105	CA	Golden Gate Bridge, Highway and Transportation District (GGBHTD)	Does not issue its own transponders.
n/a		6C		110			110	CA	Santa Clara Valley Transportation Authority (VTA)	Does not issue its own transponders.
n/a		6C		111			111	CA	South Bay Expressway, LLC (SBX)	Does not issue its own transponders.
n/a		6C		112			112	CA	Alameda County Transportation Commission (ACTC)	Does not issue its own transponders.
n/a		6C		113			113	CA	San Francisco County Transportation Authority (SFCTA)	Does not issue its own transponders.
n/a		6C		114			114	CA	San Bernardino County Transportation Authority (SBCTA)	Does not issue its own transponders.
n/a		6C		2306			n/a	England	MercyFlow	

General Notes:

A. Several agencies that have been shown in other tables and documents have been removed as they no longer collect tolls or have never collected tolls.

B. The "Reserved EZG Agency ID" represents the mapped ID that will be presented by the MPR reader to the lane controller for transponders read with the indicated Native IDs.

C. The "NIOP Tag Agency ID" represents the mapped ID that will be presented by the EZIOP Hub to other regional Hubs for transponders in its TVL and for transactions with the given "Reserved EZG Agency ID".

D. The following ATA tag references were removed from the table above since they are no longer in use:
   a. MPA. – Massport
   b. TNB. – Tacoma Narrows Bridge
   c. TXDT - Texas DOT (original issue)
   d. SATX – Texas DOT (San Antonio)
   e. PRIB – Texas DOT (Pharr Bridge/Trindel)
   f. LDO. – Laredo, Texas
   g. CASJ – St. John's Bridge, Canada
   h. CAAH – Atlantic Highway, Canada

Date	Modifications
18-Oct-18	B. Jewell: Created from ICD.
11/26/2018	B. Jewell: Removed CUSIOP and SSIOP Schedules as suggested by M. Kolb.

D: NIOP Tag Validation List Schedule

The times notes below are times when each NIOP Hub is expected to receive each other's TVL on a daily basis.

TVL	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
Bulk	3AM						
Differential		3:00 AM	3:00 AM	3:00 AM	3:00 AM	3:00 AM	3:00 AM

Revision	Revised By	Revision Notes
20190128	M. Kolb	Created.
20190129	B. Jewell	Added the following detail from MK's email: The spreadsheet has two tabs: • Plate Type – lists the DMV defined plate types for select states. The E-ZPass Group does not track this against all 50 states and also cannot vouch for the long-term accuracy of this data. For NIOP purposes, we will need to encourage individual states to keep on top of this with their own DMV and update accordingly. It should also be noted that NY technically has plate types for many other types of plates. However, the NY DMV only requires plate type (due to potential plate duplication) for plates whose content is a 1-5 digit number. Plates with alphas or 6+ digits are unique/not duplicated and, hence, do not really require plate type. There are some plate types that are not shown and indicate as "not available for general lookup". These represent plates that are not stored by the DMV in their normal DMV database and are either not available for lookup at all or are only available via alternative lookup methods. However, for the purposes of hosting these plates on an ETC account, it may be necessary for the toll agencies to create a "plate type" for these plates. • No Type – lists states that do not have plate type. Note that NY is listed here as well with a note regarding the caveat above.

License Plate Country	License Plate State	License Plate Type	Plate Description
US	CT	All Terrain	All Terrain
US	CT	Ambulance	Ambulance
US	CT	Camp Trailer	Camp Trailer
US	CT	Camper	Camper
US	CT	Combination	Combination
US	CT	Commercial	Commercial
US	CT	Congressional Medal of Honor	Congressional Medal of Honor
US	CT	Construction	Construction
US	CT	Dealer	Dealer
US	CT	Experimental Test	Experimental Test
US	CT	Factory	Factory
US	CT	Farm	Farm
US	CT	Fire Apparatus	Fire Apparatus
US	CT	General Dist Bus	General District Bus
US	CT	Handicapped	Handicapped
US	CT	Handicapped COMB	Handicapped COMB
US	CT	Handicapped Motorcycle	Handicapped Motorcycle
US	CT	Hearse	Hearse
US	CT	Historical	Historical
US	CT	Interstate	Interstate
US	CT	Legislature	Legislature
US	CT	Livery	Livery
US	CT	Motorcycle	Motorcycle
US	CT	Municipal	Municipal
US	CT	Passenger	Passenger
US	CT	Permits	Permits
US	CT	POW CMPR	POW CMPR
US	CT	POW COMB	POW COMB
US	CT	POW Veteran	POW Veteran
US	CT	Public Service Bus	Public Service Bus
US	CT	School Bus	School Bus
US	CT	School Bus Livery	School Bus Livery
US	CT	Senate	Senate
US	CT	Service Bus	Service Bus
US	CT	Snowmobile	Snowmobile
US	CT	Special Mobile Equip	Special Mobile Equip
US	CT	State	State
US	CT	State Serv Bus	State Serv Bus
US	CT	State STV	State STV
US	CT	Student Transport - Comb	Student Transport - Comb
US	CT	Student Transport - Serv Bus	Student Transport - Serv Bus
US	CT	Taxi	Taxi
US	CT	Trailer	Trailer
US	CT	Transporter	Transporter
US	CT	US Congress	US Congress
US	CT	US Senate	US Senate
US	CT	Van Pool	Van Pool
US	CT	Veteran	Veteran
US	CT	Veteran CMPR	Veteran CMPR
US	CT	Veteran COMB	Veteran COMB

License Plate Country	License Plate State	License Plate Type	Plate Description
US	CT	Vol Firefighter COMB	Vol Firefighter COMB
US	CT	Vol Firefighter COMM	Vol Firefighter COMM
US	CT	Volunteer Firefighter	Volunteer Firefighter
US	CT	Wrecker	Wrecker
US	IL	0	Specialty, Motorcycle and all other not defined by other types
US	IL	1	Passenger Car
US	IL	1	Passenger Car - Vanity
US	IL	1	Passenger Car - Personalized
US	IL	2	Temporary Plate
US	IL	Not available for general lookup	Apportioned
US	IN	AM	Motorcycle - Antique
US	IN	AN	Antique Vehicle
US	IN	AR	Amateur Radio
US	IN	AT	Organizational - Indiana Arts Commission
US	IN	BA	Organizational - Boy Scouts
US	IN	BA	Motorcycle - Boy Scout Trust
US	IN	BH	Organizational - Lincoln's Boyhood Home
US	IN	BR	College/University - Indiana University
US	IN	BU	College/University - Ball State
US	IN	CB	Bus - Church
US	IN	CP	City Police
US	IN	CT	Organizational - Department of Child Services - Kids First
US	IN	CT	Motorcycle - Department of Child Services - Kids First
US	IN	DA	Organizational - D.A.R.E.
US	IN	DC	Motorcycle - Disabled Veteran (Blue)
US	IN	DF	Passenger - Disabled Veteran (Yellow)
US	IN	DH	Passenger - Disabled Veteran
US	IN	DM	Motorcycle - Disabled Veteran (Yellow)
US	IN	EO	Elected Official
US	IN	FA	Organizational - FFA Foundation
US	IN	FA	Motorcycle - FFA Trust
US	IN	GB	Bus
US	IN	GB	Bus - Other
US	IN	HL	Organizational - Health Foundation of Greater Indianapolis
US	IN	HM	Motorcycle - Disability
US	IN	HP	Passenger - Disability
US	IN	HS	Organizational - Hoosier Safety
US	IN	HS	Motorcycle - Secure Indiana
US	IN	HT	Organizational - Environment
US	IN	HT	Motorcycle - Health Trust
US	IN	IS	College/University - Indiana State University
US	IN	MC	Motorcycle
US	IN	MO	Passenger - Municipal
US	IN	NA	Organizational - Land of the Indians
US	IN	NA	Motorcycle - Native American Trust
US	IN	NG	Military - National Guard
US	IN	NG	Motorcycle - National Guard

License Plate Country	License Plate State	License Plate Type	Plate Description
US	IN	NH	Bus - Bus C Not for Hire (High Digit)
US	IN	Not available for general lookup	Governor
US	IN	Not available for general lookup	Apportioned
US	IN	Not available for general lookup	Permanent Trailer
US	IN	PA	Passenger
US	IN	PA	Passenger
US	IN	PH	Military - Purple Heart
US	IN	PL	Passenger - Vanity
US	IN	PM	Motorcycle - Purple Heart
US	IN	PS	Military - Pearl Harbor
US	IN	PU	College/University - Purdue University
US	IN	PW	Military - POW
US	IN	PW	Motorcycle - POW
US	IN	RV	Recreational Vehicle
US	IN	SB	Bus - School (High Digit)
US	IN	SE	Semi-Trailer Permanent
US	IN	SH	Organizational - Sheriff Association
US	IN	SI	College/University - University of Southern Indiana
US	IN	SP	In God We Trust
US	IN	SP	College/University - Ivy Tech
US	IN	SP	College/University - Butler University
US	IN	SP	College/University - De Pauw University
US	IN	SP	College/University - University of Evansville
US	IN	SP	College/University - Indiana University/Purdue University
US	IN	SP	College/University - Ivy Tech Community College
US	IN	SP	College/University - Indiana State University
US	IN	SP	College/University - University of Indianapolis
US	IN	SP	College/University - Notre Dame
US	IN	SP	College/University - Purdue University
US	IN	SP	Organizational - Go Colts
US	IN	SP	Organizational - Professional Firefighters
US	IN	SP	Organizational - Indiana Shriner
US	IN	SP	Organizational - Breast Cancer Awareness
US	IN	SP	Organizational - Freemason
US	IN	SP	Organizational - Choose Life
US	IN	SP	Organizational - Habitat for Humanity
US	IN	SP	Organizational - Black Expo
US	IN	SP	Organizational - Organization of Nursing Executives
US	IN	SP	Organizational - Fraternal Order of Police
US	IN	SP	Organizational - State Police
US	IN	SP	Organizational - Juvenile Diabetes
US	IN	SP	Organizational - Clark-Floyd Counties Convention and Tourism Bureau
US	IN	SP	Organizational - Riley Hospital
US	IN	SP	Organizational - 4H Foundation
US	IN	SP	Organizational - Speedway Hall of Fame
US	IN	SP	Military - Support Our Troops
US	IN	SP	Motorcycle - Other Specialty

License Plate Country	License Plate State	License Plate Type	Plate Description
US	IN	SR	Passenger -State Representative
US	IN	SS	Passenger - State Senator
US	IN	TK	Truck - Standard
US	IN	UC	Passenger - US Congressman
US	IN	US	Passenger - US Senator
US	IN	VT	College/University - Ivy Tech
US	IN	WR	Recovery Vehicle
US	IN	XM	Motorcycle - Municipal
US	IN	XS	Bus - Municipal School Bus
US	MA	AHN/R	Camper - Normal Series
US	MA	AHR/R	Camper - Reserved Series
US	MA	AHV/R	Camper - Vanity Series
US	MA	AMN/R	Ambulance - Normal Series
US	MA	AMN/R	Animal Ambulance
US	MA	AMR/R	Ambulance - Reserved Series
US	MA	APN/R	Apportioned
US	MA	ATN/A	Authority - MBTA Police
US	MA	ATN/A	Authority - Berkshire Regional Transit
US	MA	ATN/A	Authority - Brockton Area Transit
US	MA	ATN/A	Authority - Cape Ann Transit
US	MA	ATN/A	Authority - Cape Cod Regional Transit
US	MA	ATN/A	Authority - Franklin Regional Transit
US	MA	ATN/A	Authority - Greater Attleboro
US	MA	ATN/A	Authority - Greenfield Montague Transit
US	MA	ATN/A	Authority - Lowell Regional Transit
US	MA	ATN/A	Authority - Southeast Transit
US	MA	ATN/A	Authority - MBTA
US	MA	ATN/A	Authority - Mass Turnpike
US	MA	ATN/A	Authority - Merrimack Valley Regional
US	MA	ATN/A	Authority - Metro West Regional Transit
US	MA	ATN/A	Authority - Montachusett Regional Transit
US	MA	ATN/A	Authority - Nantucket Regional Transit
US	MA	ATN/A	Authority - Pioneer Valley Transit
US	MA	ATN/A	Authority - Southeastern Regional Transit
US	MA	ATN/A	Authority - Water Resources Authority
US	MA	ATN/A	Authority - Worcester Regional Transit
US	MA	AXN/A	Motorcycle - Authority - MBTA
US	MA	BUN/R	Bus - Normal Series
US	MA	BUR/R	Bus - Reserved Series
US	MA	BUV/R	Bus - Vanity Series
US	MA	CON/R	Commercial - Normal Series
US	MA	CON/R	Commercial -Electric Vehicle
US	MA	CON/R	Commercial - Hearse
US	MA	CON/R	Commercial - Snow Removal
US	MA	COR/R	Commercial - Reserved
US	MA	COR/R	Commercial - Reserved - Hearse
US	MA	COV/R	Commercial - Vanity Series
US	MA	DLN/B	Passenger - Car Dealer
US	MA	DLV/B	Passenger - Car Dealer Vanity
US	MA	DMN/B	Motorcycle - Dealer

License Plate Country	License Plate State	License Plate Type	Plate Description
US	MA	FAN/B	Farmer
US	MA	LVN/R	Livery - Normal Series
US	MA	LVR/R	Livery - Reserved Series
US	MA	LVV/R	Livery - Vanity Series
US	MA	MCN/B	Motorcycle-Normal Series
US	MA	MCR/B	Motorcycle-Reserved Series
US	MA	MCR/B	Motorcycle-Reserved Series-Antique
US	MA	MCR/B	Motorcycle-Reserved Series - Blue Knight
US	MA	MCR/B	Motorcycle-Reserved Series - Red Knight
US	MA	MCS/B	Motorcycle - Special Series-Disability
US	MA	MCS/B	Motorcycle - Special Series-Veteran
US	MA	MCS/B	Motorcycle - Special Series-Veteran - Gold Star Family
US	MA	MCS/B	Motorcycle - Special Series-Veteran - Cong. Medal of Honor
US	MA	MCS/B	Motorcycle - Special Series-Veteran - Legion of Valor
US	MA	MCS/B	Motorcycle - Special Series-Veteran - Silver Star
US	MA	MCS/B	Motorcycle - Special Series-Veteran - Bronze Star
US	MA	MCS/B	Motorcycle - Special Series-Veteran - Distinguished Flying Cross
US	MA	MCS/B	Motorcycle - Special Series-Veteran - Purple Heart
US	MA	MCS/B	Motorcycle - Special Series-Veteran - Pearl Harbor Survivor
US	MA	MCS/B	Motorcycle - Special Series-Veteran - Ex-POW
US	MA	MCV/B	Motorcycle - Vanity Series
US	MA	MVN/M	Municipal - Fire
US	MA	MVN/M	Municipal - Police
US	MA	MVN/M	Municipal - Normal
US	MA	MVN/M	Municipal - Boston
US	MA	MXN/M	Motorcycle - Municipal
US	MA	MXN/M	Motorcycle - Municipal
US	MA	OCN/B	Owner Contractor
US	MA	PAN/G	Passenger - Normal Series (Green characters)
US	MA	PAN/R	Passenger - Normal Series
US	MA	PAR/R	Passenger - Reserved Series
US	MA	PAS/R	Passenger - Special Series - Handicapped
US	MA	PAS/R	Passenger - Special Series - Nantucket Island
US	MA	PAS/R	Passenger - Special Series - Plymouth 400th Anniversary
US	MA	PAS/R	Passenger - Special Series - Blackstone Valley
US	MA	PAS/R	Passenger - Special Series - Cape & Islands
US	MA	PAS/R	Passenger - Special Series - Islands & Cape
US	MA	PAS/R	Passenger - Special Series - Electric Vehicle
US	MA	PAS/R	Passenger - Special Series - Fish & Wildlife
US	MA	PAS/R	Passenger - Special Series - Right Whale
US	MA	PAS/R	Passenger - Special Series - Invest in Children
US	MA	PAS/R	Passenger - Special Series - Animal Coalition
US	MA	PAS/R	Passenger - Special Series - Conquer Cancer
US	MA	PAS/R	Passenger - Special Series - Firefighter Memorial
US	MA	PAS/R	Passenger - Special Series - Breast Cancer
US	MA	PAS/R	Passenger - Special Series - United We Stand

License Plate Country	License Plate State	License Plate Type	Plate Description
US	MA	PAS/R	Passenger - Special Series - Basketball Hall of Fame
US	MA	PAS/R	Passenger - Special Series - Red Sox
US	MA	PAS/R	Passenger - Special Series - Jimmy Fund
US	MA	PAS/R	Passenger - Special Series - Olympic Spirit
US	MA	PAS/R	Passenger - Special Series - Bruins/Youth Hockey
US	MA	PAS/R	Passenger - Special Series - Patriots
US	MA	PAS/R	Passenger - Special Series - Mini Fenway Park
US	MA	PAS/R	Passenger - Special Series - Celtics/ Boston Children's
US	MA	PAS/R	Passenger - Special Series - Choose Life
US	MA	PAS/R	Passenger - Special Series - U Mass
US	MA	PAS/R	Passenger - Special Series - Medical Doctor
US	MA	PAS/R	Passenger - Special Series - Ham Radio Operator
US	MA	PAS/R	Passenger - Special Series - Antique
US	MA	PAS/R	Passenger - Special Series - Antique Vanity
US	MA	PAS/R	Passenger - Special Series - News Photographer
US	MA	PAS/R	Passenger - Special Series - Low Speed Vehicle
US	MA	PAS/R	Passenger - Special Series - Limited Use Vehicle
US	MA	PAS/R	Passenger - Special Series - Governor's Council
US	MA	PAS/R	Passenger - Special Series - Honorary Consular Corps.
US	MA	PAS/R	Passenger - Special Series - Foreign Organization
US	MA	PAS/R	Passenger - Special Series - Veteran
US	MA	PAS/R	Passenger - Special Series - Disabled Veteran
US	MA	PAS/R	Passenger - Special Series - Disabled Veteran
US	MA	PAS/R	Passenger - Special Series - Purple Heart
US	MA	PAS/R	Passenger - Special Series - Bronze Star
US	MA	PAS/R	Passenger - Special Series - Silver Star
US	MA	PAS/R	Passenger - Special Series - Support Veterans
US	MA	PAS/R	Passenger - Special Series - Pearl Harbor Survivor
US	MA	PAS/R	Passenger - Special Series - Medal of Honor
US	MA	PAS/R	Passenger - Special Series - Legion of Valor
US	MA	PAS/R	Passenger - Special Series - Ex POW
US	MA	PAS/R	Passenger - Special Series - Distinguished Flying Cross
US	MA	PAS/R	Passenger - Special Series - Gold Star Family
US	MA	PAS/R	Passenger - Special Series - National Guard
US	MA	PAS/R	Passenger - Special Series - Disaster/ Emergency Vehicle
US	MA	PAS/R	Passenger - Special Series - State Senate
US	MA	PAS/R	Passenger - Special Series - State House of Reps.
US	MA	PAS/R	Passenger - Special Series - US Congress
US	MA	PAS/R	Passenger - Special Series - US Senate
US	MA	PAV/R	Passenger - Vanity Series
US	MA	PAY/V	Passenger - Year of Manufacture Series
US	MA	PAY/V	Motorcycle -Year of Manufacture
US	MA	RPN/B	Repair
US	MA	RPV/B	Repair - Vanity
US	MA	SBN/R	School Bus - Normal Series
US	MA	SBR/R	School Bus - Reserved Series
US	MA	SMN/R	Semi Trailer - Normal Series

License Plate Country	License Plate State	License Plate Type	Plate Description
US	MA	SMR/R	Semi Trailer - Reserved Series
US	MA	SPN/Y	Pupil - Normal Series
US	MA	STN/S	State Trooper
US	MA	STN/S	State
US	MA	STN/S	Environmental Police
US	MA	SXN/S	Motorcycle - State Police/ Trooper
US	MA	SXN/S	Motorcycle - Environmental Police
US	MA	TAN/R	Taxi - Normal Series
US	MA	TAR/R	Taxi - Reserved Series
US	MA	TPN/B	Transporter
US	MA	TRN/R	Trailer - Normal Series
US	MA	TRR/R	Trailer - Reserved Series
US	MA	VPN/R	Vanpool - Normal Series
US	ME	AC	Agriculture Commercial
US	ME	AF	Agriculture Farm Vehicle
US	ME	AG	Agriculture Support
US	ME	AM	Ambulance/Hearse
US	ME	AP	Apportioned
US	ME	AQ	Antique Auto
US	ME	AW	Animal Welfare
US	ME	BB	Black Bear
US	ME	BC	Breast Cancer Support
US	ME	BH	Barbara Bush Children's Hospital
US	ME	BU	Bus
US	ME	CC	Conservation Commercial
US	ME	CD	Conservation Disability
US	ME	CI	Municipal
US	ME	CI	Municipal-Police
US	ME	CI	County Govt.
US	ME	CL	Conservation Trailer
US	ME	CM	Combination
US	ME	CO	Standard Commercial
US	ME	CR	Conservation
US	ME	CS	County Sheriff
US	ME	CV	Custom Vehicle
US	ME	DL	New Car Dealer
US	ME	DS	Special Veteran-Handicapped
US	ME	DV	Disabled Veteran
US	ME	DX	Disability
US	ME	ED	Equipment Dealer
US	ME	EM	EMS
US	ME	EX	Experiment
US	ME	FD	Fire Fighter
US	ME	FM	Farm Vehicle
US	ME	GS	Gold Star Family
US	ME	HF	Honorary Foreign Consul
US	ME	HL	Maine House
US	ME	HS	Maine Senate
US	ME	HT	Heavy Trailer Dealer
US	ME	HW	Heavy Wrecker

License Plate Country	License Plate State	License Plate Type	Plate Description
US	ME	LB	Lobster
US	ME	LC	Lobster Commercial
US	ME	LO	Loaner
US	ME	LT	Light Trailer Dealer
US	ME	MC	Motorcycle
US	ME	MD	Motorcycle Dealer
US	ME	MH	Motor Home
US	ME	MM	Municipal Motorcycle
US	ME	MO	Medal Of Honor
US	ME	MQ	Antique Motorcycle
US	ME	MX	Handicapped Motorcycle
US	ME	PC	Standard Passenger
US	ME	PH	Purple Heart
US	ME	PM	Purple Heart Motorcycle
US	ME	PO	Former POW
US	ME	PS	Pearl Harbor Survivor
US	ME	RV	Conservation Motor Home
US	ME	SE	Special Equipment
US	ME	SP	State Police
US	ME	SR	Street Rod
US	ME	ST	State Vehicle
US	ME	SW	Sportsman
US	ME	TD	Transporter
US	ME	TL	Trailer - Annual Renewal
US	ME	TL	Trailer - Long Term
US	ME	TR	Tractor
US	ME	TS	Support Troops
US	ME	TT	Commercial Tractor
US	ME	TX	Vehicle For Hire (Taxi)
US	ME	UC	Used Car Dealer
US	ME	UM	University Of Maine System
US	ME	VM	Special Veteran Motorcycle
US	ME	VT	Special Veteran
US	ME	VX	Disabled Veteran-Handicapped
US	ME	WB	Wabinaki
US	ME	WR	(Light) Wrecker
US	ME	WX	Handicapped Motor Home
US	ME	XV	Disabled Veteran Motorcycle
US	NH	AGRI	Agriculture
US	NH	AMBU	Ambulance
US	NH	AMOT	Motorcycle - Antique
US	NH	ANTI	Antique
US	NH	APRO	Apportioned
US	NH	COMM	Commercial
US	NH	CONEQ	Construction Equipment
US	NH	CPASS	Conservation Heritage - Moose (ends with C)
US	NH	DVETE	Disabled Veteran - Passenger
US	NH	FARM	Farm
US	NH	FPOW	Former POW
US	NH	HCAP	Handicap Passenger

License Plate Country	License Plate State	License Plate Type	Plate Description
US	NH	HMOTO	Motorcycle - Handicap
US	NH	HPASS	Conservation Heritage - Moose (ends with H)
US	NH	HRSE	Hearse
US	NH	IANTI	Antique - Vanity
US	NH	IAPRO	Apportioned - Vanity
US	NH	ICOMM	Commercial - Vanity
US	NH	ICPAS	Conservation Heritage - Moose - Vanity
US	NH	IDVET	Disabled Veteran - Passenger - Vanity
US	NH	IFPOW	Former POW - Vanity
US	NH	IHCAP	Handicap Passenger - Vanity
US	NH	IHMOTO	Motorcycle - Handicap - Vanity
US	NH	IMOTO	Motorcycle - Vanity
US	NH	INGNH	National Guard - Vanity
US	NH	INPUR	Passenger - Purple Heart - Vanity
US	NH	IPASS	Initial Passenger - Vanity
US	NH	IPMOT	Motorcycle - Purple Heart - Vanity
US	NH	ISPCPS	Moose (Conservation) Park - Vanity
US	NH	ISPPS	Passenger - State Park - Vanity
US	NH	ISROD	Street Rod - Vanity
US	NH	ITRAI	Trailer - Vanity
US	NH	IVMOT	Motorcycle - Veteran - Vanity
US	NH	IVVET	Passenger - Veteran - Vanity
US	NH	MOTO	Motorcycle
US	NH	NGNH	National Guard
US	NH	NHNG	National Guard
US	NH	Not available for general lookup	Supreme Court
US	NH	Not available for general lookup	Superior Court
US	NH	Not available for general lookup	State Police
US	NH	Not available for general lookup	Municipal Police
US	NH	Not available for general lookup	Motor Vehicle Department
US	NH	Not available for general lookup	State Senate
US	NH	Not available for general lookup	State House of Representatives
US	NH	Not available for general lookup	Governor's Council
US	NH	Not available for general lookup	US Congress
US	NH	Not available for general lookup	US Senate
US	NH	Not available for general lookup	Attorney General
US	NH	Not available for general lookup	US Attorney
US	NH	Not available for general lookup	Governor
US	NH	NPHBR	Pearl Harbor Survivor - Vanity
US	NH	NPURP	Passenger - Purple Heart
US	NH	PADMN	Permanent - State - ADMINISTRATION
US	NH	PAGRI	Permanent - State - AGRICULTURE

License Plate Country	License Plate State	License Plate Type	Plate Description
US	NH	PASS	Standard Passenger
US	NH	PBANK	Permanent - State - BANKING
US	NH	PCIVIL	Permanent - State - CIVIL DEFENSE
US	NH	PDRED	Permanent - State - DRED
US	NH	PEDUC	Permanent - State - EDUCATION
US	NH	PENVS	Permanent - State - ENV SVC/POLICE STAND
US	NH	PERM	Permanent - City of Town
US	NH	PESE	Permanent - State - PEASE AIRFORCE
US	NH	PFISH	Permanent - State - FISH & GAME
US	NH	PHBR	Pearl Harbor Survivor
US	NH	PHGWY	Permanent - State - HIGHWAY
US	NH	PHMOT	Motorcycle - Purple Heart
US	NH	PHWEL	Permanent - State - NH HOSPITAL & WELFARE
US	NH	PJUDL	Permanent - State - JUDICIAL
US	NH	PLABR	Permanent - State - LABOR
US	NH	PLIBR	Permanent - State - LIBRARY
US	NH	PLIQR	Permanent - State - LIQUOR
US	NH	PMISC	Permanent - State - MISCELLANEOUS
US	NH	PMOTR	Permanent - State - LOCAL GVT MOTORCYCLE
US	NH	PNATG	Permanent - State - NATIONAL GUARD
US	NH	PPLOT	Permanent - State - POLICE STAND TRAINING
US	NH	PPRIS	Permanent - State - PRISON
US	NH	PREVN	Permanent - State - REVENUE ADMINISTRATOR
US	NH	PSAFTY	Permanent - State - SAFETY/HIGHWAY ENFORCEMENT
US	NH	PSWEP	Permanent - State - SWEEPSTAKES
US	NH	PTRAL	Permanent - State - STATE GOVERNMENT TRAILERS
US	NH	PUNIV	Permanent - State - UNIVERSITY WATER POLLUTION/CONTROL
US	NH	PYDEV	Permanent - State - YOUTH DEVELOPMENT
US	NH	SBUS	School Bus
US	NH	SCOMM	Special Commercial
US	NH	SPCPS	Moose (Conservation) Park
US	NH	SPPAS	Passenger - State Park
US	NH	SROD	Street Rod
US	NH	TRAI	Trailer
US	NH	VMOTO	Motorcycle - Veteran
US	NH	VVETE	Passenger - Veteran
US	NY	ARG	Air National Guard
US	NY	AYG	Army National Guard
US	NY	BOB	Birthplace of Baseball
US	NY	CCK	County Clerk
US	NY	CCK	County Clerk President Plate
US	NY	CME	Coroner
US	NY	CME	Medical Examiner
US	NY	CMH	Congressional Medal of Honor
US	NY	DLR	Dealer
US	NY	FAR	Farm
US	NY	GAC	Governor's Additional Car
US	NY	GSC	Governor's Second Car
US	NY	GSM	Gold Star Mothers

License Plate Country	License Plate State	License Plate Type	Plate Description
US	NY	JCA	Court of Appeals
US	NY	JCL	Court of Claims
US	NY	JSC	Supreme Court-Appelate Div
US	NY	JWV	Jewish War Veterans
US	NY	LMA	Limited Use Motorycycle - type A
US	NY	LMB	Limited Use Motorycycle - type B
US	NY	LMC	Limited Use Motorycycle - type C
US	NY	MED	Medical Doctor
US	NY	MOT	Motorcycle Handicap
US	NY	NLM	Naval Militia
US	NY	NYA	New York State Assembly
US	NY	NYA	NYS Assembly Second Plate
US	NY	NYC	New York Council
US	NY	NYS	New York State Senate
US	NY	NYS	NYS Senate-Second Plate
US	NY	PAS	Passenger Handicap
US	NY	PHS	Pearl Harbor Survivors
US	NY	SOS	Survivors of the Shield
US	NY	SRN	Justice Supreme Crt Appl Term
US	NY	STA	State Pair
US	NY	STA	State Single
US	NY	STG	State National Guard
US	NY	SUP	Supreme Court Justice
US	NY	TRA	Transporter
US	NY	USC	U.S. Congress
US	NY	USS	U.S. Senate
US	NY	VAS	Volunteer Ambulance Services
US	RI	1	Private Passenger
US	RI	2	Commercial
US	RI	3	Trailer
US	RI	4	Motorcycle
US	RI	5	Public Service
US	RI	6	Camper
US	RI	7	Suburban
US	RI	8	School Bus
US	RI	9	Jitney
US	RI	10	State
US	RI	11	City
US	RI	12	Town
US	RI	13	Police
US	RI	14	State Police
US	RI	15	Fire Apparatus
US	RI	16	House
US	RI	17	Senate
US	RI	18	Radio Operator
US	RI	19	Antique
US	RI	20	Disabled Veteran
US	RI	21	Farm
US	RI	22	Taxi
US	RI	23	New Car Dealer

License Plate Country	License Plate State	License Plate Type	Plate Description
US	RI	24	Used Car Dealer
US	RI	25	In-Transit
US	RI	26	Transporter
US	RI	27	Bailee
US	RI	28	Manufacturer
US	RI	29	Racer Tow
US	RI	30	State Police Cycle
US	RI	31	Police Cycle
US	RI	32	Cycle Dealer
US	RI	33	Ex-POW
US	RI	34	Boat Dealer
US	RI	35	40 & 8
US	RI	36	Purple Heart
US	RI	37	Veteran
US	RI	38	National Guard
US	RI	39	Combination
US	RI	99	Special Design Plate
US	VT	A	Pleasure Car
US	VT	A	Vanity
US	VT	A	Amateur Radio Operator
US	VT	A	American Legion
US	VT	A	Antique
US	VT	A	Building Bright Futures
US	VT	A	Conservation - Catamount
US	VT	A	Conservation - Peregrine Falcon
US	VT	A	Emergency Medical Service
US	VT	A	Exhibition
US	VT	A	Ex-POW
US	VT	A	Fire/ Rescue Association
US	VT	A	Freemason
US	VT	A	Gold Star Family
US	VT	A	Handicap
US	VT	A	Lion's Club
US	VT	A	Low Numbers
US	VT	A	National Guard
US	VT	A	Pearl Harbor Survivor
US	VT	A	Purple Heart
US	VT	A	Rotary
US	VT	A	Street Rod
US	VT	A	Veteran
US	VT	A	Veteran - Handicap
US	VT	A	Veteran - Afghanistan Campaign
US	VT	A	Veteran - Foreign Wars
US	VT	A	Veteran - Vietnam War
US	VT	A	Veteran - World War II
US	VT	A	Vietnam Veterans of America
US	VT	A	State - House Speaker
US	VT	A	State - House of Representative
US	VT	A	State - Senate
US	VT	A	US House

License Plate Country	License Plate State	License Plate Type	Plate Description
US	VT	A	US Senate
US	VT	B	Trailer - Vanity
US	VT	B	Federal Program
US	VT	B	Off Highway Tractor
US	VT	B	Zone Plate
US	VT	B	Truck
US	VT	B	Truck - Amateur Radio Operator
US	VT	B	Truck - American Legion
US	VT	B	Truck - Antique
US	VT	B	Truck - Apportioned
US	VT	B	Truck - Conservation
US	VT	B	Truck - Emergency Medical Service
US	VT	B	Truck - Exhibition
US	VT	B	Truck - Ex-POW
US	VT	B	Truck - Fire/ Rescue Association
US	VT	B	Truck - Freemason
US	VT	B	Truck - Gold Star Family
US	VT	B	Truck - Handicap
US	VT	B	Truck - Lion's Club
US	VT	B	Truck - National Guard
US	VT	B	Truck - Pearl Harbor Survivor
US	VT	B	Truck - Purple Heart
US	VT	B	Truck - Rotary
US	VT	B	Truck - Special Purpose
US	VT	B	Truck - Veteran
US	VT	B	Truck - Veteran - Handicap
US	VT	B	Truck - Veteran - Foreign Wars
US	VT	B	Truck - Veteran - Gulf War
US	VT	B	Truck - Veteran - Iraq Campaign
US	VT	B	Truck - Veteran - Korean War
US	VT	B	Truck - Vietnam Veterans of America
US	VT	C	Trailer - Apportioned
US	VT	C	Trailer - Contractor
US	VT	C	Trailer - Heavy
US	VT	C	Trailer - Light
US	VT	D	Agriculture
US	VT	E	Auction Car Dealer
US	VT	E	Farm Machinery Dealer
US	VT	E	Finance Car Dealer
US	VT	E	Highway Building Equipment Dealer
US	VT	E	New Car Dealer
US	VT	E	Used Car Dealer
US	VT	E	Transporter
US	VT	E	Trailer - Dealer
US	VT	E	Motorcycle - Dealer
US	VT	G	Motorcycle
US	VT	G	Motorcycle - Antique
US	VT	G	Motorcycle - Handicap
US	VT	I	Bus
US	VT	I	Bus - Local Transit

License Plate Country	License Plate State	License Plate Type	Plate Description
US	VT	J	Volunteer
US	VT	J	Municipal (Local Government)
US	VT	J	Municipal - Sheriff
US	VT	K	DMV
US	VT	K	Driver Education
US	VT	K	Game Warden
US	VT	K	State - State Colleges
US	VT	K	State - State Government
US	VT	K	State - State Officers
US	VT	K	State - State Police

License Plate Country	License Plate State	License Plate Type	Plate Description

License Plate Country	License Plate State	Notes
US	DC	
US	DE	
US	FL	
US	MD	
US	NC	
US	NJ	
US	OH	
US	PA	
US	WV	
US	NY	Plate type is only required for all numeric plates consisting of 1-5 digits. Entries on the "Plate Type" tab are the most common ones with that pattern.

The Central US Region Supplement
to the <u>Interface Control Document for National Interoperability</u>
Version 1.10

Table of Contents

Modification History

Date	Version	Modifications
December 2018	1.00	Created from the SSIOP ICD after the final draft of the NIOP ICD Version 1.00 was distributed.
October 2019	1.10	Updated based on the CUSIOP decision to make the Date/Time w/Time zone fields optional, until transactions are to be sent to the first NIOP Hub. Thu 9/12/2019 7:17 PM Chawla, Juhi <jchawla@ntta.org> RE: Implementing NIOP Subset compliance requirements. Proposal to make new timezone entry/exit date fields as optional. - Proposal accepted by all technical teams for all CUSIOP HUB agencies To: Mmtra, Anil (HCTRA); Rajesh Murugathi; Sangeetha Karunamoorthy (ETC); Stoppenhagen, Gloria R.; Sheila.Reiter@txdot.gov; Blake Butterworth; Seymour, Joni; Boulden, Amanda; Greg Mack; Brad Urban; HCTRA-TollingApps; Juan Saenger; Jessica Carson; Jennifer Larson; kristinadovling@milestoneassociates.com; Soraribekar, Preeti; Govindaswamy, Viju; Varalkoth, Sreenish; Bruce Meisch; Hoffman, David; Sreedharan, Sreenath; Jewell, Barb; Barb Jewell; Mark Ferguson Cc: Bruce Meisch; Tracie Brown; Lisa Castañeda (Lisa.Castaneda@HCTRA.org); Jeff Dailey; Mike Stone; Rick Nelson - (Richard.Nelson@TxDOT.gov); Rodriguez, Yoovany (Gio); Dave Machamer - (DMachamer@PikePass.com); Ryan Dale; Chawla, Juhi You replied to this message on 9/23/2019 11:19 AM. To: CUSIOP Technical Team CC: CUSIOP Steering committee This is to formalize a deviation from in the NIOP Spec for the Central Region to implement the two new timezone fields ("Exit Date/Time w/TZ" & "Entry Date/Time w/TZ") as optional fields instead of "required" fields as specified in the NIOP ICD The approach has been acknowledged and agreed to, by all central HUB agencies technical teams (CTRMA, E-470, FortBend, HCTRA, KTA, NTTA, OTA, & TXDOT) and the CUSIOP HUB technical team. This solution allows E-470 to join the HUB as planned in first quarter next year, assuming all testing is good and they are ready to, without the concern for all other CUSIOP HUB agencies to be ready with NIOP changes at the same time. Please let me know if you have any questions Thanks, Juhi Added Section 1.2 Implementation Considerations in order to document the NIOP Implementation phases.

1   Introduction

1.1   General

The purpose of this document is to describe and record salient ICD-related items specific to Central US Interoperability (CUSIOP) that are different from the National Interoperability (NIOP) ICD or the original SSIOP ICD.

The italicized print in this document is text that is re-instated from SSIOP ICD for the purposes of Central US Interoperability.

The blue print in this document is where changes were made in the NIOP ICD Specifications that affect Central US Interoperability.

The red print in this document is where changes were made based on the Central US Agencies' agreement to the recommended ICD modifications or additional content to this document.

This document, together with the NIOP ICD, is the ICD for Central US Interoperability and replaces the Southern States IOP (SSIOP) ICD.

1.2   Implementation Considerations

The modifications required to become NIOP compliant will be implemented in two phases.

Phase 1: Testing for this phase will begin as part of the E-470 Public Highway Authority testing.

1) Guaranteed Transactions for Other Hubs – 30 Days
   NIOP Transaction Guarantee: 30 Days
   CUSIOP Transaction Guarantee: 10 Days
   Both time frames will be in effect when the first NIOP Hub is connected to the CUSIOP Hub.

2) Transaction Data Reconciliation – 48 Hours
   NIOP Transaction Data Reconciliation: 48 Hours
   CUSIOP Transaction Data Reconciliation: 24 Hours
   Both time frames will be in effect when the first NIOP Hub is connected to the CUSIOP Hub.

3) Exit and Entry Date/Time Fields, with Time Zone – additional fields
   Transactions that originate at a CUSIOP Agency and are destined for a NIOP Agency shall contain the additional fields or risk being rejected.
   Transactions that originate at a CUSIOP Agency and are destined for another CUSIOP Agency do not require these additional fields.

4) Vehicle Classification in Transaction – Optional 4 Characters
   The Vehicle Classification in the Transaction Data is not required to be populated and has been change from 4 digits to 4 characters.

5) Multiple TVLs – One per Hub
   When the first NIOP Hub is connected to the CUSIOP Hub, each CUSIOP Agency will receive an additional TVL (one per each connected hub).

Phase 2: Testing for this phase will begin when the EZHub testing commences.
   1) Field Size Changes:
         I.   Tag Serial Number – increased from 8 to 10 digits.
        II.   License Plate Type – increased from 20 to 30 characters.
       III.   TVL Record Count – increased from 9 to 10 characters.
   2) License Plate State Codes – Add "GS" as a State Code.

2   General Data Requirements

2.1   SFTP File Transfer Guidelines

2.1.1   Central US Region-Specific File Transfer Guidelines

When transferring files between the CUSIOP Hub and its Agencies via SFTP, the guidelines in this section should be followed.

Inbound Files to the CUSIOP Hub from the CUSIOP Agencies:

1. *Each CUSIOP Agency connects to the CUSIOP Hub's SFTP server with their credentials.*

2. *Each CUSIOP Agency shall have their own "Inbound" directories on the CUSIOP Hub SFTP server based on each submission type:*
   a. STRAN
   b. STRAN_ACK
   c. SRECON
   d. SRECON_ACK
   e. SCORR
   f. SCORR_ACK
   g. STVL
   h. STVL_ACK

   For example:
   /HCTRA/{env}/inbound/STVL/

   Where {env} = PROD or PREPROD

3. *Each CUSIOP Agency shall copy (SFTP) files from their local directories to the appropriate CUSIOP Hub SFTP server Inbound "/temp" directory.*

   For example:
   /HCTRA/{env}/inbound/STVL/temp

4. *Each CUSIOP Agency 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

5. *If the file transfer is successful, the CUSIOP Agency shall "move" the file from the "/temp" directory to the "/current" directory.*

   For example:
        Move from:

>   */HCTRA/{env}/inbound/STVL/temp*

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

6. *If the file transfer fails, the CUSIOP Agency shall delete the file from the "/temp" directory.*

<u>*Outbound Files from the CUSIOP Hub to the CUSIOP Agencies:*</u>

1. *Each CUSIOP Agency connects to the CUSIOP Hub SFTP server with their credentials.*

2. *Each CUSIOP Agency shall have their own "Outbound" directories on the CUSIOP Hub SFTP server based on each submission type:*
   a. *STRAN*
   b. *STRAN_ACK*
   c. *SRECON*
   d. *SRECON_ACK*
   e. *SCORR*
   f. *SCORR_ACK*
   g. *STVL*
   h. *STVL_ACK*

   For example:
   >   */HCTRA/{env}/outbound/STVL/*

   Where {env} = PROD or PREPROD

3. *The CUSIOP Hub shall "move" files from the CUSIOP Hub SFTP server Outbound "/stage" directory to the "/current" directory.*

   For example:
   >   <u>*Move from:*</u>
   >   */HCTRA/{env}/outbound /STVL/stage*

   >   <u>*To:*</u>
   >   */HCTRA/{env}/outbound/STVL/current*

4. *Each CUSIOP Agency shall copy (SFTP) files from the "/current" directory to their local directories.*

5. *Each CUSIOP Agency 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 CUSIOP Agency shall "delete" the file from the "/current" directory.*

7. *If the file transfer fails, the CUSIOP Agency can try to download the file from the "/current" directory again.*

3 Tag Validation List (TVL) Data

3.1 Data Records/Fields

The fields below contain additional information in the description for the Central US Region.

Tag Validation List Header Record				
Field	**Type**	**Max Length**	**Required/ Optional**	**Description**
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. *The ID assigned to the Away SSIOP Hub when transmitting the Tag Validation Data from the Away SSIOP Hub to the Away Agency.* Refer to NIOP ICD Appendix A for valid values.
Record Count	Num	10	Required	The number of detail records contained in this file. Values: 0 – 9999999999 November, 2018: The Max Length for Record Count was changed from 9 to 10 (numeric field).

Tag Validation List Detail Record				
Field	**Type**	**Max Length**	**Required/ Optional**	**Description**
NIOP 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. November 2018: Appendix C reference was changed to NIOP Appendix C. Field (in this table) was changed from "Tag Agency ID to NIOP Tag Agency ID.
Tag Serial Number	Char	10	Required	Serial Number that may be read from the transponder. Leading zeroes are included and required. 10 decimal digits 0 – 9 converted to a character field. November 2018: The Max Length for Tag Serial Number was changed from 8 to 10 characters and the Description was modified in the NIOP ICD.

Tag Validation List Detail Record				
Field	**Type**	**Max Length**	**Required/ Optional**	**Description**

License Plate State	Char	2	Optional	Standard Postal Service State abbreviation (or Province abbreviation for Canada). For Mexico, this field would contain MX. Values:
				
				 Publication 28, Appendix B – US State abbreviations
				    http://pe.usps.com/text/pub28/28apb.htm
				 Publication 28, Appendix A.A32 – Canadian Province abbreviations
				    http://pe.usps.com/text/pub28/28apa_005.htm
				 "GS" – Used for plates issued by any Federal agency.
				 "-" – Used for plates not in the referenced documentation.
				
				 If a License Plate Number is provided, the License Plate State must be provided.
				
				 November 2018: "GS" was added to the NIOP ICD as a valid value for LP State.

License Plate Type	Char	30	Optional	Plate type as required for DMV lookups. If Home Agency provides License Plate Type, Away Agency must match to that License Plate Type and must include License Plate Type in any plate based transactions. November 2018: The Max Length for LP Type was changed from 20 to 30 characters in the NIOP ICD.

3.2   Processing Requirements

3.2.1   CUSIOP Specific Processing Requirements

1. *Exchange of TVL Data will be via SFTP.*

2. *The CUSIOP Hub will send a consolidated TVL to the SSIOP Hub(s).*

3. *The CUSIOP Hub will send consolidated TVLs for each Hub (1 TVL per Hub) to local Agencies.*

4. *Consolidated TVLs will have a Home Agency ID of the Home Hub in the file name and header record.*

5. *The local Agencies shall filter their tags from the TVL based on the business rules at the local Agency.*

6. *The local Agencies will receive one consolidated TVL from each IOP Hub.*

7. *If any Agency is late with a TVL, the CUSIOP Hub will use the last ACKed (with Return Code = 00 or 02) Bulk TVL from the Agency and apply the last ACKed (with Return Code = 00 or 02) Differential to the Bulk and create the Bulk for the Agency to include in the consolidated TVL. The next Differential created by a Home Agency should reflect the tags that are different from the last good Bulk TVL sent by the Hub.*

8. *If the CUSIOP Hub receives a Bulk TVL from an Agency after the cut-off time, the CUSIOP Hub will reject the Bulk TVL and send an ACK (with Return Code = 12) to the CUSIOP Agency/SSIOP Hub.*

9. *The CUSIOP Hub will not filter tags when the same Tag Agency Code and Tag Identifier is received from multiple Agencies.*

10. *The CUSIOP will use the Submission Date/Time (UTC) in the TVL to local Agencies as the Activation Date/Time for the CUSIOP Hub.*

1. *The CUSIOP Hub will use the 2nd ACK Date/Time (UTC) as the Activation Date/Time of the TVLs distributed between Hubs.*

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

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

4. *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.*

4   Transaction Data

4.1   File Data Exchange over SFTP

File Name:

{SSIOP_HUB_ID}_{AWAY_AGENCY_ID}_{HOME_AGENCY_ID}_YYYYMMDDHHMMSS.STRAN

Example: If FTE transaction (0035) for NTTA (0041) goes through the Southeast Hub (9001) to the Central US Hub (9002), the name would be 9001_0035_0041_20150820122115.STRAN

4.2   Data Records/Fields

The fields below contain additional information in the description for the Central US Region.

Transaction Data Header Record				
Field	**Type**	**Max Length**	**Required/ Optional**	**Description**
Submission Date/Time	Date/Time	20	Required	The date/time (UTC) the submission was created or the web service request was submitted. *Shall match the date/time in the file name for data file exchange over SFTP.*
NIOP Hub ID	Char	4	Required	*As Applicable:* *The ID assigned to the Away SSIOP Hub when transmitting Transaction Data from the Away Agency to the Away SSIOP Hub* The ID assigned to the Away Hub when transmitting Transaction Data from the Away Hub to the Home Hub. *The ID assigned to the Home Hub when transmitting Transaction Data from the Home Hub to the Home Agency.* Refer to NIOP ICD Appendix A for valid values.
Away Agency ID	Char	4	Required	The Agency ID of the Away Agency. This is the agency on whose facility the transaction took place. Refer to NIOP Appendix B *and Appendix B in this document* for valid values.

Transaction Data Header Record				
Field	Type	Max Length	Required/ Optional	Description
Home Agency ID	Char	4	Required	*As Applicable:* *The ID assigned to the Home Agency when transmitting Transaction Data from the Home Hub to the Home Agency.* The ID assigned to the Home Agency when transmitting Transaction Data from the Away Hub to the Home Hub. *'0000' when transmitting Transaction Data from the Away* *Agency to the Away Hub and the Away Agency has not determined the Home Agency.* *The ID assigned to the Home Agency when transmitting Transaction Data from the Away Agency to the Away SSIOP Hub and the Away Agency already determined the Home Agency.* Refer to NIOP ICD 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. *As Applicable:* *The Away Agency generates their unique number when sending Transaction Data to the Away SSIOP Hub.* *The Away SSIOP Hub generates their unique number when sending Transaction Data to the Home SSIOP Hub, associating their number to the Away Agency's number.* *The Home SSIOP Hub generates their unique number when sending Transaction Data to the Home Agency, associating their number to the Away SSIOP Hub's number.*

				Transaction Data Detail Record	
Field	**Type**	**Max Length**	**Required/ Optional**	**Description**
NIOP 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. *If the LVL is used to look-up license plate information for a video transaction, the Tag Agency ID, Tag Serial Number, and Tag Status will not be populated by the Away Agency.* November 2018: Appendix C reference was changed to NIOP Appendix C. Field (in this table) was changed from "Tag Agency ID to NIOP Tag Agency ID.
Tag Serial Number	Char	10	Required	Serial Number that may be read from the transponder. Leading zeroes are included and required. 10 decimal digits 0 – 9 converted to a character field. *If the LVL is used to look-up license plate information for a video transaction, the Tag Agency ID, Tag Serial Number, and Tag Status will not be populated by the Away Agency.* November 2018: The Max Length for Tag Serial Number was changed from 8 to 10 characters and the Description was modified in the NIOP ICD.

Tag Status	Char	1	Required	Tag Status associated with the Exit Date/Time as determined by the Away Agency from the then active TVL.
				If the TVL is used to look-up license plate information for a video transaction, the Tag Agency ID, Tag Serial Number, and Tag Status shall be populated by the Away Agency.
				
				If the LVL is used to look-up license plate information for a video transaction, the Tag Agency ID, Tag Serial Number, and Tag Status will not be populated by the Away Agency.
				
				Values:
				  V – Valid
				  I – Invalid
				  Z – Zero/Negative Balance

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. November 2018: The Type for Vehicle Classification was changed from Num to Char and from Required to Optional.

Transaction Data Detail Record				
Field	**Type**	**Max Length**	**Required/ Optional**	**Description**

License Plate State	Char	2	Optional	Standard Postal Service State abbreviation (or Province abbreviation for Canada). For Mexico, this field would contain MX.
				Values:
				
				Publication 28, Appendix B – US State abbreviations
				    http://pe.usps.com/text/pub28/28apb.htm
				Publication 28, Appendix A.A32 – Canadian Province abbreviations
				    http://pe.usps.com/text/pub28/28apa_005.htm
				"GS" – Used for plates issued by any Federal agency.
				"-" – Used for plates not in the referenced documentation.
				
				If a License Plate Number is provided, the License Plate State must be provided.
				
				November 2018: "GS" was added to the NIOP ICD as a valid value for LP State.

License Plate Type	Char	30	Optional	Plate type as required for DMV lookups. If Home Agency provides License Plate Type, Away Agency must match to that License Plate Type and must include License Plate Type in any plate based transactions. November 2018: The Max Length for LP Type was changed from 20 to 30 characters in the NIOP ICD.
Exit Date/Time w/TZ	Char	25	Required *Optional until transactions are sent from the Away Agency for consumption outside of the CUSIOP Region	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. November 2018: Added field. September 2019: Added "Optional" clause.
Entry Date/Time w/TZ	Char	25	Required if the Entry Date/Time is provided *Optional until transactions are sent from the Away Agency for consumption outside of the CUSIOP Region	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 November 2018: Added field. September 2019: Added "Optional" clause.

4.3   Processing Requirements

4.3.1   Central US Region-Specific Processing Requirements

1. *Exchange of Transaction Data will be via SFTP.*

2. *When the Home Agency ID within the Transaction Data Header has been specified as other than '0000' by the Away Agency (that is, the ID of the Home Agency has already been determined by the Away Agency), the value specified shall be honored by the Away SSIOP Hub.*

3. *If the LVL is used to look-up license plate information for a video transaction, the Tag Agency ID, Tag Serial Number, and Tag Status will not be populated by the Away Agency. These fields are optional when processing transactions using the LVL for Central US Interoperability transaction processing.*

4. *Spare 1 is used by the CUSIOP Hub to specify whether the transaction is guaranteed or not. If the Tag was Valid in the transaction, the CUSIOP Hub will determine if the Tag was Valid in the TVL based on the Away Agency's Hub's Active TVL as long as the transaction is received within 10 days of the transaction date. If the Tag was Valid, the transaction is guaranteed (1). If not, the transaction is not guaranteed (0). Transactions with Invalid or Zero/Negative Balance Tags will not be guaranteed (0).*

5. *Spare 2 is used by the CUSIOP Hub to specify the Activation Date/Time (UTC) of the TVL used to determine the Guaranteed Flag in the Spare 1 field. The Activation Date time is the TVL Activation Date Time for the Hub where the transaction originated. This fields will be formatted as a typical Date/Time (UTC) field.*

6. *The frequency of the transaction submission by each Away Agency is at the discretion of the Away Agency.*

5   Adjustment/Correction Data

5.1   File Data Exchange over SFTP

File Name:

{SSIOP_HUB_ID}_{AWAY_AGENCY_ID}_{HOME_AGENCY_ID}_YYYYMMDDHHMMSS.SCORR

> *Example: 9001_0035_0040_20171201001015.SCORR*

5.2   Data Records/Fields

The fields below contain additional information in the description for the Central US Region.

Adjustment/Correction Data Header Record				
Field	**Type**	**Max Length**	**Required/ Optional**	**Description**
Submission Date/Time	Date/Time	20	Required	The date/time (UTC) the submission was created or web service request was submitted. *Shall match the date/time in the file name for data file exchange over SFTP.*

Adjustment/Correction Data Header Record				
Field	Type	Max Length	Required/ Optional	Description
NIOP Hub ID	Char	4	Required	*As Applicable:* *The ID assigned to the Away SSIOP Hub when transmitting Transaction Data from the Away Agency to the Away SSIOP Hub* The ID assigned to the Away Hub when transmitting Transaction Data from the Away Hub to the Home Hub. *The ID assigned to the Home Hub when transmitting Transaction Data from the Home Hub to the Home Agency.* Refer to NIOP ICD Appendix A for valid values.
Away Agency ID	Char	4	Required	The Agency ID of the Away Agency. This is the agency on whose facility the transaction took place. Refer to NIOP Appendix B *and Appendix B in this document* 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 NIOP ICD Appendix B for valid values.

5.3 Processing Requirements

5.3.1 *Central US Region-Specific Processing Requirements*

1. *Each Away Agency should specify where the adjustment, correction or resubmittal should be sent based on the prior Reconciliation Data.*

2. *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 who provided the Reconciliation Data unless the Away Agency specified the Home Agency to begin with.*

6 Reconciliation Data

6.1 *File Data Exchange over SFTP*

File Name:

{SSIOP_HUB_ID}_{HOME_AGENCY_ID}_{AWAY_AGENCY_ID}_YYYYMMDDHHMMSS.SRECON

Example: 9001_0035_0040_20171201041015.SRECON

6.2   Data Records/Fields

The fields below contain additional information in the description for the Central US Region.

Reconciliation Data Header Record				
Field	**Type**	**Max Length**	**Required/ Optional**	**Description**
Submission Date/Time	Date/Time	20	Required	The date/time (UTC) the submission was created or web service request was submitted. *Shall match the date/time in the file name for data file exchange over SFTP.*
NIOP Hub ID	Char	4	Required	*As Applicable:* *The ID assigned to the Away SSIOP Hub when transmitting Transaction Data from the Away Agency to the Away SSIOP Hub* The ID assigned to the Away Hub when transmitting Transaction Data from the Away Hub to the Home Hub. *The ID assigned to the Home Hub when transmitting Transaction Data from the Home Hub to the Home Agency.* Refer to NIOP ICD Appendix A for valid values.
Home Agency ID	Char	4	Required	*As Applicable:* *The ID assigned to the Home Agency when transmitting Transaction Data from the Home Hub to the Home Agency.* The ID assigned to the Home Agency when transmitting Transaction Data from the Away Hub to the Home Hub. *'0000' when transmitting Transaction Data from the Away* *Agency to the Away Hub and the Away Agency has not determined the Home Agency.* *The ID assigned to the Home Agency when transmitting Transaction Data from the Away Agency to the Away SSIOP Hub and the Away Agency already determined the Home Agency.* Refer to NIOP ICD 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. Refer to NIOP Appendix B *and Appendix B in this document* for valid values.

Reconciliation Data Detail Record				
Field	Type	Max Length	Required/ Optional	Comment
Spare 1	Char	20	Optional	Spare field for future growth. *Defined by the CUSIOP Hub as Spare 1 from the Transaction Data; the Guaranteed Transaction flag, where 1 = Guaranteed, 0 = Not Guaranteed, blank = not used.*
Spare 2	Char	20	Optional	Spare field for future growth. *Defined by the CUSIOP Hub as Spare 1 from the Transaction Data; the Activation Date and Time (UTC) of the TVL used to determine the Guaranteed Flag. This field will be in a Date/Time (UTC) format.*

6.3   Processing Requirements

6.3.1   Central US Region-Specific Processing Requirements

1. *Spare 1 is used by the CUSIOP Hub to specify whether the transaction is guaranteed or not. If the Tag was Valid in the transaction, the CUSIOP Hub will determine if the Tag was Valid in the TVL based on the Away Agency's Hub's Active TVL as long as the transaction is received within 10 days of the transaction date. If the Tag was Valid, the transaction is guaranteed (1). If not, the transaction is not guaranteed (0). Transactions with Invalid or Zero/Negative Balance Tags will not be guaranteed (0).*

2. *Spare 2 is used by the CUSIOP Hub to specify the Activation Date/Time (UTC) of the TVL used to determine the Guaranteed Flag in the Spare 1 field. The Activation Date time is the TVL Activation Date Time for the Hub where the transaction originated. This fields will be formatted as a typical Date/Time field.*

7   Acknowledgement Data

7.1   Usage

Acknowledgment data shall be created by the Hub/*Agency* which received the file or web service request to inform the Hub/*Agency* 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 Acknowledgment Data shall be returned using the same delivery method of the submission being acknowledged.

7.2   *File Data Exchange over SFTP*

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

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

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

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

7.3 Data Record/Fields

Acknowledgement Data Detail Record				
Field	Type	Max Length	Required/ Optional	Comment
NIOP Hub ID	Char	4	Required	*As Applicable:* *The ID assigned to the Away SSIOP Hub when transmitting Transaction Data from the Away Agency to the Away SSIOP Hub* The ID assigned to the Away Hub when transmitting Transaction Data from the Away Hub to the Home Hub. *The ID assigned to the Home Hub when transmitting Transaction Data from the Home Hub to the Home Agency.* Refer to NIOP ICD Appendix A for valid values.
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.

Appendix B: Agency IDs

The following table supplements the NIOP ICD Appendix B.

Table B-1: Agency IDs

SSIOP Agency ID	NIOP Agency ID	Assigned IOP Hub	Agency Description
	0000		*Home or Away Agency not specified.*
1001	9002		*Tolling Services Agreements: LBJ, NTE Segment 1&2, NTE 3a/3b (Cintra)*
1002	9002		*Tolling Services Agreements: DFW Region (TxDOT)*

Appendix D: Tag Validation List Schedule

The Tag Validation List schedules for the Central US Region are included in this section. These schedules may change from time to time.

D-2: CUSIOP Hub and Agency Tag Validation List Schedule

The times noted are times when the CUSIOP Hub will initiate the TVL Process for the CUSIOP Hub for local Agencies. TVLs from CUSIOP Agencies should be created and transferred to the CUSIOP Hub 1 hour before the CUSIOP Hub scheduled time.

CUSIOP Schedule:

TVL	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
Bulk	8 PM						
Differential	2 AM		2 AM	2 AM	2 AM	2 AM	2 AM

	8 AM	8 AM	8 AM	8 AM	8 AM	8 AM	8 AM
	2 PM	2 PM	2 PM	2 PM	2 PM	2 PM	2 PM
	8 PM	8 PM	8 PM	8 PM	8 PM	8 PM	8 PM

ATTACHMENT B: CTRMA BUSINESS RULES

- The Mobility Authority Business Rules - Lane Systems 1.0 FINAL DRAFT - CLEAN

LANE SYSTEM BUSINESS RULES

Version 1.0
December 2019

FINAL DRAFT

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Revision History

Date	Version	Author	Description of Modifications
November – December 2019	1.0	B. Jewell, MBI Consulting, Inc. on behalf of Fagan Consulting.	Created from Central Texas Regional Mobility Authority - 45SW-290E-183S Open Road Tolling Kapsch Business Rules V2.0 and sections 2.0, 2.1, 2.2, 2.3 and 2.4 of the Toll Collection Business Rules Version 2.5. Business rules that are the same as in the Toll Collection Business Rules have the same business rule number as in the Toll Collection Business Rule document.

Document References

Title and Description	Version
CUSIOP Business Rule Supplement	Most current version.
NIOP Business Rules	Most current version.
Failure to Pay Toll Statute From the Texas Transportation Code Regional Mobility Authorities (Also found in the CTRMA, NET RMA PBM RFP Appendix G dated March 31, 2017)	Added by Acts 2003, 78th Leg., ch. 1325, § 2.01, eff. June 21, 2003. Amended by Acts 2005, 79th Leg., ch. 23, § 2, eff. Sept. 1, 2005; Acts 2005, 79th Leg., ch. 281, § 2.70, eff. June 14, 2005.
CTRMA The Mobility Authority Business Rules – Draft. Prepared For Central Texas Regional Mobility Authority By MBI Consulting, Inc.	Version 1.1, March 23-27, 2012
CTRMA Violation Processing Business Rules -Draft. Prepared For Central Texas Regional Mobility Authority By MSB	Version 0.4, June 14, 2011

1   Introduction

The purpose of this document is to record the business rules of Central Texas Regional Mobility Authority (CTRMA) as they relate to lane systems and transactions.

1.1   Purpose

The purpose of this document is to track and maintain the Mobility Authority's business rules. This document is a living document. When a business rule is changed, the "Last Update/Verification" date will be updated with the date the rule was recorded or verified. Any additional notes may be maintained in the revision history. **Values stated in the "Value" column of the rules are understood to be user configurable and not system-related changes.**

1.2   Definitions, Acronyms, Abbreviations

Term	Definition
Automatic Vehicle Classification (AVC)	The toll lane system that detects and classifies vehicles based on the number of axles.
Automatic Vehicle Identification (AVI)	The radio frequency system that identifies vehicles using transponders as they pass fixed antennas or readers to automatically charge the toll to the Customer.
AVI Transaction	Each electronic record of a toll that constitutes one toll payable from a customer, respecting a vehicle that (a) passes through a toll lane, (b) is equipped with a transponder issued by a Transponder Issuer, and (c) has a sufficient account balance at the time of posting or re-posting to pay the applicable toll in full.
Away Agency (a.k.a. Visited Authority)	An Interoperable Agency that is not the Customer's Home Agency.
Back Office System (BOS)	The toll processing system that contains the Central Host, Image Review, Customer Service and Violations Processing subsystems.
CTRMA	Central Texas Regional Mobility Authority
Exempt Vehicle	A vehicle that qualifies for non-revenue travel on the toll road.
Home Agency	An Interoperable Agency which owns and maintains the customer account of vehicle(s) and transponder(s) to which interoperable toll transactions are posted based on the respective interoperability business rules.
Image-based Transaction	Each electronic record of a toll and image(s) of license plates and other video data with respect to a vehicle without a valid Transponder read.
iToll	Term used for a Video Transaction that is sent for posting, or is posted to a Customer Account.
License Plate Validation List (LVL)	A comprehensive list of registered license plate accounts in use by a toll authority together with the current status (e.g., active, invalid) of the underlying customer account.
MOPAC	MOPAC Express Lanes
Optical Character Recognition (OCR)	Optical Character Recognition is software that extracts the number and jurisdiction from an image of a vehicle's front or rear license plate.
Pay By Mail (PBM)	An Account option for Customers that post-pay for their toll road usage based solely on their license plate(s).

Term	Definition
Processing Hub	Hub where AVI Transactions and Video Transactions are processed when a match is found in the TVL or LVL for the vehicle.
Transaction	An event that occurs when a vehicle travels through a tolling location where the event may or may not be associated with a transponder read. Refers to both an AVI and Video Transaction.
Transponder	A device placed on or within a motor vehicle that is capable of transmitting or receiving information used to assess or collect tolls that results in recognizable vehicle identification for tolling purposes.
Transponder Validation List (TVL)	A comprehensive list of transponders in use by a toll authority together with its' current status (e.g., Valid, Invalid).
Video Processing Center (VPC)	Location where Video Transactions are processed and posted to Pay By Mail accounts.
Video Transaction	Each electronic record of a toll and video image(s) of license plates and other video data with respect to a vehicle without a valid Transponder read and processed through Pay By Mail.
Violation	A Video Transaction that is not matched to a Transponder account and remains unpaid after initial invoicing.
Variable Toll Message Sign (VTMS)	Indicates a pricing sign.
Zone Controller	Refers to the Zone Controller, image capture and sign process.

2 Business Rules

2.1 General Business Rules

General business rules are applicable to every transaction, unless superseded by a rule within the Express Lanes Business Rules section.

2.1.1 Transaction Pricing Business Rules

The business rules in this section address the aspects of applying toll rates to transactions.

Business Rule Number	Value/Term	Condition/Rule Description	Last Update/ Verification
LBR-TR-01	Time of Day Pricing	Toll rates are variable based on a pre-defined time of day pricing that is configurable per hour of day and day of week.	December 2019
BR-1	Axle-based Classification	Vehicle classification methodology used at the Mobility Authority. Toll rates are variable based on the pre-defined Axle-based classification scheme.	December 2019
BR-2	2 through 6	Allowable vehicle classifications.	December 2019
BR-3	<= 2 axles	Number of axles on a class 2 vehicle.	December 2019
BR-4	3 axles	Number of axles on a class 3 vehicle.	December 2019
BR-5	4 axles	Number of axles on a class 4 vehicle.	December 2019
BR-6	5 axles	Number of axles on a class 5 vehicle.	December 2019
BR-7	6+ axles	Number of axles on a class 6 vehicle.	December 2019
LBR-TR-02	Toll Rate Configuration	Toll rates may be configured based on how the transaction originated (AVI, Video), and how the transaction is pursued (Processing Hub based on the TVL or LVL, or Toll Bill process (Pay by Mail) and the vehicle's Axle-based Classification.	December 2019
BR-8	AVI Toll Rate	Toll rate applied for AVI Transactions that match to a valid entry in the TVL, the toll rate applied will be the AVI Rate.	December 2019
BR-500	AVI Toll Rate	Toll rate applied to Image-based Transactions that match to a valid entry in the TVL.	December 2019
BR-9	PBM Toll Rate	Toll Rate applied to Image-based Transactions matched to a valid entry in the LVL.	December 2019
BR-10	PBM Toll Rate	Toll Rate applied to Image-based Transactions that do not match to a valid entry in the TVL or LVL and are pursued through the Toll Bill process in the back office system (BOS).	December 2019
LBR-TR-03	Toll Rate Implementation	A new rate will go into effect immediately following the scheduled time or day as dictated according to the pre-defined time of day schedule.	December 2019

Business Rule Number	Value/Term	Condition/Rule Description	Last Update/ Verification
BR-18	$0.00	Toll Rate when the lane is closed.	December 2019

2.1.2   In-Lane Transaction Processing Business Rules

This section describes the business rules related to transaction processing at the lane level.

Business Rule Number	Value/Term	Condition	Last Update/ Verification
BR-11	Vehicle presence (every vehicle's image is saved)	Reasons for saving an image of the vehicle in the lane.	December 2019
BR-12	Front and Rear	Images saved for each vehicle in the lane.	December 2019
BR-13	1 image	Number of images saved of the front of the vehicle.	December 2019
BR-14	1 image	Number of images saved of the rear of the vehicle.	December 2019
BR-15	AVC	Default vehicle classification (unless the vehicle classification system is degraded).	December 2019
BR-16	Transponder class (if tag is present) or Class 2 (2 axles)	Default vehicle classification if the AVC is degraded. Transactions created when the vehicle classification system is degraded are flagged and reported.	December 2019
BR-19	Spurious Tag Read	Transponders that were sent from the Reader to the Zone Controller properly but were unable to be correlated to a vehicle/transaction are recorded as a spurious tag read and not used for any further processing. Spurious Tag Reads are reported to assist in measuring lane performance for all tolling points.	December 2019
BR-501	Buffered Tag Read	Transponders that were not sent from the Reader to the Zone Controller properly (delayed), are recorded as a Buffered Tag Reads and not used for any further processing. Buffered Tag Reads are reported to assist in measuring lane performance for all tolling points.	December 2019
BR-502	Normal Tag Read	Transponders that were successfully sent from the Reader to the Zone Controller and correlated to vehicle/transactions are recorded as a "Normal" Tag Read Transaction and processed in accordance with approved business rules and workflows.	December 2019

Business Rule Number	Value/Term	Condition	Last Update/ Verification
		Normal AVI Transactions are reported to assist in measuring lane performance for all tolling points.	
BR-17	Multi-transponder Reads	If multiple Transponders are read in the lane for 1 vehicle, the first Valid Tag with the most recently updated tag status is used. All other Transponder reads are recorded and associated to the transaction, but not used for billing purposes. The Transponder used for payment or billing is marked as such.	December 2019
LBR-TP-01	Date/Time the vehicle exits the toll point	Transaction Date/Time. The timestamp of the transaction. The format of the timestamp is to the millisecond: HH:MM:SS.000. Note: The following timestamps are available for reporting: 1. entry (when the transaction enters the tolling zone,) 2. tag acquisition (when the tag is read), and 3. exit (when the transaction exits the tolling zone.)	December 2019
BR-22	Tag Status	Transponders that are read and included in AVI Transactions are compared to the Tag Validation List in the Central Host to determine tag status. The tag status is recorded in the Transaction.	December 2019

2.1.3   Image Review Business Rules

This section describes the business rules related to image review.

Business Rule Number	Value/Term	Condition/Rule Description	Last Update/ Verification
BR-40	Unlimited	Number of times an image can be reviewed.	December 2019
BR-45	100%	Percentage of transactions and images requiring review after the transactions and images enter the Image Review process.	December 2019
BR-41	OCR Review	Each image of a transaction will go through OCR review first, and be assigned an OCR confidence value.	December 2019
LBR-IR-01	Manual Review	Manual Review is performed at the transaction level. Individual transactions are sent for manual review and one result is returned for the transaction (rather than one result per image).	December 2019
LBR-IR-02	Front Image	Image selected when the vehicle classification is > 2 axles.	December 2019

Business Rule Number	Value/Term	Condition/Rule Description	Last Update/ Verification
LBR-IR-03	Every Image (configurable)	Image confidence requiring manual image review.	December 2019
LBR-IR-04	Manual Review Result	If a transaction is sent to manual review, the result of this review will take precedent over any other reviews performed by OCR. In other words, the manual review result is always the license plate value that will be applied to the transaction.	December 2019
BR-46	No Plate, Motorcycle, Out-of-State, Temporary Plate, Unreadable Plate, Camera Issue	Manual Image "Code offs" during Image Review.	December 2019
LBR-IR-05	Supervisor Escalation	A manual review will be escalated to a supervisor for review if one of the following conditions is met: 1. Transaction is marked as a code-off 2. Transaction has had 4 (configurable) reviews without 2 (configurable) matching reviews	December 2019
BR-42	2	Number of times an image review must match before the review is accepted (includes being coded off).	December 2019
BR-43	14 days from the Transaction Date	Maximum amount of time an image should be in Image Review.	December 2019
LBR-IR-06	Image Review Complete Criteria	Image review will be considered complete when one of the following conditions is met: 1. Transaction has two independent matching reviews 2. Transaction has been reviewed by a supervisor	December 2019
LBR-IR-07	OCR Review Qualification	The result of OCR will be counted as one of the 4 (configurable) allowable reviews when the confidence level is >= 90 (configurable).	December 2019
LBR-IR-08	Rejected Transaction Finalization	Transactions that are rejected (coded-off) during image review will not be pursued further.	
BR-44		At any time, a supervisor may override the image review results prior to transaction exiting the Image Review process and the review will be accepted.	December 2019
BR-32		After Image Review, rejected images (a.k.a. "code offs") will not be pursued further.	December 2019

2.1.4 Central Host Processing Business Rules

This section describes the business rules related to the processing of Transactions at the Central Host.

Business Rule Number	Value/Term	Condition/Rule Description	Last Update/ Verification
BR-35		An Exempt Vehicle List (containing license plates and tags) is maintained so that vehicles, in accordance with the Mobility Authority's non-revenue policy, are allowed non-revenue access. For example, First Responders are maintained on this list.	December 2019
BR-36		Exempt Vehicle List may be used for quarantining transactions from license plates that have special billing arrangements with the Mobility Authority.	December 2019
BR-33	Exempt Vehicle Processing, TVL, LVL	Order in which Transactions are processed. Every Transaction should be compared to 1. the Exempt Vehicle List before any payment processing takes place. If the vehicle exists in good standing within the Exempt Vehicle List, the transaction should be marked as non-revenue, and no further processing take place. 2. If there is no match to the Exempt Vehicle List, the Transaction is compared to the TVL 3. And, then the LVL. If the transaction matched the TVL or the LVL the transaction is sent to the Processing Hub.	December 2019
BR-505	Duplicate Transaction	Multiple transactions for the same vehicle shall not be processed. This may consist of: 1. An AVI Transaction and Video Transaction for the same vehicle at the same location, direction and time (within a threshold (parameter)). 2. Multiple AVI Transactions for the same vehicle at the same location, direction and time (within a threshold (parameter)). 3. Multiple Video Transactions for the same vehicle at the same location, direction and time (within a threshold (parameter)).	December 2019
BR-23	All, irrespective of status	AVI Transactions are sent to the Processing Hub to determine if they will post to Home Agency customer accounts or be accepted by the Home Agency.	December 2019
BR-24		Transactions with a disposition of "Posted" from the Processing Hub will not be processed further.	December 2019
BR-37		Transactions rejected by the Processing Hub that have already been through Image Review will be compared against the Non-Revenue list (again) before being sent for Toll Bill processing.	December 2019
BR-25	999	Number of times a transaction can be re-submitted to the Processing Hub. It is expected that the time limit for resubmitting transactions will expire before the number of retries.	December 2019
BR-503	10	Number of times a transaction is resubmitted when a "System/Communication Error" (S) is returned from the Processing Hub.	December 2019

Business Rule Number	Value/Term	Condition/Rule Description	Last Update/ Verification
BR-504	3	Number of times a Transaction is resubmitted when a "Not Posted" (N) is returned from the Processing Hub.	December 2019
BR-26	60 days from the transaction date	Amount of time the Central Host must submit or re-submit a transaction to the Processing Hub for processing.	December 2019
BR-27		AVI Transactions must have a rejected Processing Hub disposition before being sent to image review.	December 2019
BR-28	96 hours	Amount of time the Central Host should wait for a disposition from the Processing Hub before alerting the Mobility Authority of a potential problem.	December 2019
BR-29	15 days	Maximum amount of time the Central Host should wait for a disposition from Image Review before alerting the Mobility Authority of a potential problem.	December 2019
BR-39	5 days from the transaction date	Transactions must be sent to VPC for processing within this amount of time.	December 2019
LBR-CH-01	25 Days	Number of days from the transaction date that the transactions must be sent for billing.	December 2019
LBR-CH-02	Pay by Mail Sending Allowance	Pay by Mail transactions must be sent for billing within 60 (configurable) days of transaction timestamp.	December 2019
LBR-CH-03	Tag Transaction Image Review	Valid Tag-based transactions must have a final rejected HUB disposition (after being resubmitted, if applicable) prior to being sent for image review.	December 2019
LBR-CH-04	iToll Processing	After Image Review, the plate will be compared against the TVL and License Plate Validation List (LVL) for qualification as an iToll transaction.	December 2019
LBR-CH-05	LVL Matching	A transaction qualifies as matching a plate within the LVL if the plate assigned to the transaction matches a plate within the LVL that is either current or has expired in the last 30 (configurable) days.	December 2019

2.1.5   Data Retention Business Requirements

Business Rule Number	Value/Term	Condition/Rule Description	Last Update/ Verification
BR-30	7 (configurable) months from transaction date.	The maximum amount of time images will be stored for paid transactions.	December 2019
BR-31	2.5 years from transaction date	Maximum amount of time images will be stored for transactions that have not been paid.	December 2019
LBR-DR-01	30 Days	Minimum number of days data must be stored in the Lane Controllers.	December 2019

2.2   Express Lane Business Rules

The business rules described in this Section will take precedence over those described in the "General Business Rules" section.

2.2.1   Express Lane Usage Business Rules

This section describes the business rules governing the use of the Express Lane by drivers.

Business Rule Number	Value/Term	Condition/Rule Description	Last Update/ Verification
LBR-XU-01	Express Lane Access	Access to the express lanes is only allowed at designated entry and/or exit locations.	December 2019
LBR-XU-02	Express Lane Separation	The express lanes will be separated from the general-purpose lanes by barrier sticks.	December 2019
LBR-XU-03	Segment Definition	The travel facility is divided into segments. Each segment consists of a single corresponding toll point. The northbound facility consists of the segments: Enfield, Far West The southbound facility consists of the segments: RM2222, Parmer	December 2019
LBR-XU-04	Toll Point Definition	A toll point is a physical location where vehicles are detected by transponder and/or license plate number.	December 2019

2.2.2 Express Lane Operations Business Rules

This section describes the business rules for operating the Express Lanes.

Business Rule Number	Value/Term	Condition/Rule Description	Last Update/Verification
LBR-XO-01	Tolling Operation	Express lane hours of operation shall be configured on a per-segment basis to a maximum of 24 hours a day/7 days a week/365 days a year.	December 2019
LBR-XO-02	Non-Tolling Operation	During non-tolling operations, the express lanes shall be either closed or open to all vehicles.	December 2019
LBR-XO-03	Non-Tolling Data Collection	During non-tolling operations, the system will continue to gather information, read transponders, and capture license plates images, but the collected data will not be utilized for billing purposes.	December 2019
LBR-XO-04	Manual Overrides	The system may be manually placed in a non-tolling mode (as described in MOPAC-ELO-2), and the system will continue to gather data as described in LBR-XO-3.	December 2019
LBR-XO-05	VTMS Pricing Display	Each VTMS will display a maximum of 2 destinations at a time and the associated toll rates.	December 2019
LBR-XO-06	VTMS Pricing Lock	During normal operations, a customer will be charged the price displayed on the VTMS at the point the customer enters the express lane.	December 2019
LBR-XO-07	VTMS Non-Tolling Display	During non-tolling operation, the General Message LED Panel of the VTMS will display a configurable message up to 7 characters in length including blanks.	December 2019
LBR-XO-08	VTMS Comms Failure	In the event of a communications failure to the VTMS, the affected VTMS will display locally stored rates which are stored directly on the VTMS. The VTMS will initially display the last published message/toll rate for 10 minutes (configurable) before failing over to the locally stored rates.	December 2019
LBR-XO-09	VTMS Display Failure	In the event of a display failure in which a VTMS is partially or completely blank, customers will be charged $0.00.	December 2019
LBR-XO-10	VTMS Incident Display	In the event of a traffic incident or lane closure, the toll rate message on the VTMS can be manually overridden by an authorized express lane operator with a message from a pre-determined set of allowable messages.	December 2019

Business Rule Number	Value/Term	Condition/Rule Description	Last Update/Verification
LBR-XO-11	VTMS Incorrect Fare	In the event that a VTMS does not display the expected fare, the displayed fare shall be charged, and the system will immediately attempt to publish the correct rate.	December 2019
LBR-XO-12	VTMS Toll Display	During normal operational state, the VTMS will display toll rates determined by the following hierarchy: 1. Value Manually overridden/Selected 2. Dynamic Pricing Algorithm 3. Time of Day Rate Schedule 4. Default Rates 5. Locally Stored Rates	December 2019
LBR-XO-13	Toll Rate Adjustment (Traffic Incident)	In the event of an incident or accident, Toll Rates for the entire Travel Facility or individual segment can be manually overridden by an authorized express lane operator. This override can be applied to the entire travel facility or to one or more segments for a specified period of time and can include a past time period (i.e., retroactively).	December 2019
LBR-XO-14	ELO Toll Management	Authorized express lane operators will have the capability to manually set a toll rate or select the use of rate schedule pricing.	December 2019
LBR-XO-15	Lane Closure (Maintenance)	The Express Lane may be placed in closed mode by Segment as necessary to perform preventive and corrective maintenance on tolling equipment in the lane and on the roadside. During closures, VTMS will display a "CLOSED" message and transaction data will be captured with a rate of $0.00.	December 2019
LBR-XO-16	VTMS Allowable Messages	The following approved messages are allowable when performing manual overrides of the VTMS: CLOSED FREE	December 2019

2.2.3 Express Lane Pricing Business Rules

The business rules in this section address all the aspects of traffic data collection/usage and setting/applying Toll Rates.

Business Rule Number	Value/Term	Condition/Rule Description	Last Update/ Verification
LBR-XP-01	Dynamic Pricing Definition	Toll rates are dynamically priced using a controller algorithm. The algorithm can consider only the Express Lane or a combination of both the Express Lane and the General-Purpose lanes traffic density and/or volumes and/or vehicle speeds to evaluate demand and determine the corresponding toll rate.	December 2019
LBR-XP-02	Pricing Hardware Configuration (Express Lane)	The traffic detection devices shall feed the dynamic pricing controller algorithm traffic data from the Express Lane no less than every 30 seconds. (configurable)	December 2019
LBR-XP-03	Pricing Hardware Configuration (General Purpose Lane)	The traffic detection devices shall feed the dynamic pricing controller algorithm traffic data from the General-Purpose lanes no less than every 30 seconds. (configurable)	December 2019
LBR-XP-04	Rate Calculation (Default Config)	For each Segment, all data from the traffic detection devices within the direction of travel of the entire Facility may be used for the algorithm's calculation.	December 2019
LBR-XP-05	Rate Calculation (Required Data)	Based upon the traffic detection device mappings, 50% of temporal coverage is needed and no more than 1.5 miles of spatial coverage can be missing in order for the algorithm to calculate the Toll Rate.	December 2019
LBR-XP-06	Rate Calculation (Insufficient Data)	If the configurable number of mapped traffic detection devices are not available at the required interval or do not have data, the Toll Rate will be based upon the volume at the toll plaza points.	December 2019
LBR-XP-07	Rate Calculation (Discarded Data)	If data from any specific traffic detection device is degraded or not available at the required interval to feed the algorithm, it will not be considered during the algorithm calculation.	December 2019
LBR-XP-08	Rate Calculation (Subsegment Config)	Segments may have multiple traffic detection devices that take priority and have a higher value for the algorithm to consider.	December 2019
LBR-XP-09	Minimum Toll Rate	The Minimum Toll Rate for any one segment trip is $0.25. (Configurable) The minimum Toll Rate for any multi segment trip is $0.50. (Configurable)	December 2019
LBR-XP-10	Maximum Toll Rate Facility	The Maximum Toll Rate allowed on the Express Lane during Hours of operation will be $99.99 for the entire facility. (Configurable)	December 2019

Business Rule Number	Value/Term	Condition/Rule Description	Last Update/ Verification
LBR-XP-11	Toll Rate Display Interval	The Toll Rate displayed on the VTMS signs shall be automatically updated every 4 minutes. (Configurable)	December 2019
LBR-XP-12	Toll Rate Increase Config	For each rate cycle, the Toll Rate will not automatically increase by more than $1.00 per segment.	December 2019
LBR-XP-13	Toll Rate Decrease Config	For each rate cycle, the Toll Rate will not automatically decrease by more than $1.00 per segment.	December 2019
LBR-XP-14	Full Trip Toll Rate	The entire Travel Facility price should never be less than an individual segment.	December 2019
LBR-XP-15	Displayed Rate	Rate displayed on the VTMS will reflect the base price for an Automatic Vehicle Identification (AVI) transaction.	December 2019
LBR-XP-16	Toll Scheduling	Dynamic Pricing will have configurable parameters (called toll schedules) and there can be numerous such toll schedules which can be used for different traffic/anomaly conditions.	December 2019
LBR-XP-17	Manual Override & TOD Dynamic Pricing Impact	Dynamic Pricing will continue to run in the background when pricing is in time of day or manual mode.	December 2019
LBR-XP-18	Maximum Manual Override Toll Rate Increase	The maximum toll rate increase implemented by a manual override shall be $10.00.	December 2019
LBR-XP-19	Maximum Manual Override Toll Rate Decrease	The maximum toll rate decrease implemented by a manual override shall be $10.00.	December 2019

2.2.4 Trip Building Business Rules

This section focuses on how Lane Transactions from tolling points are associated into Trips using the Trip Building process.

Business Rule Number	Value/Term	Condition/Rule Description	Last Update/ Verification
BR-21	Within 72 hours of the Transaction Date	Amount of time in which Trips must be built.	December 2019
LBR-XTB-01	Trip Transaction	Lane Transactions in the same direction of travel along the entire Travel Facility or a combination of Segments will be assembled into Trip Transactions in the Central Host.	December 2019

Business Rule Number	Value/Term	Condition/Rule Description	Last Update/ Verification
LBR-XTB-02	Trip Direction Restriction	Only transactions from the same direction of travel can be included in a trip per Facility. The Mopac Express Lanes have northbound or southbound direction of travel.	December 2019
LBR-XTB-03	Lane Transaction to Trip Transaction Relationship	A single unique Lane Transaction will not be included in more than one Trip Transaction. The relationship should be one or many Lane Transactions to a single Trip Transaction, not many Trip Transactions to a single Lane Transaction.	December 2019
LBR-XTB-04	Trip Travel Time	The allowable travel time for the northbound direction of travel shall be 1 hour and southbound shall be 1 hour, both configurable. The travel time will establish the length of time for which transactions can be formed into a trip.	December 2019
LBR-XTB-05	Segment Travel Time	The allowable travel time for a given Segment shall be configurable.	December 2019
LBR-XTB-06	Lane Transaction Association to a Trip Transaction	Lane Transactions received at the Central Host shall be associated with the same Trip Transaction if the Lane Transactions meet the following criteria: 1. Transponder ID and/or license plate number identification is sufficient for association. 2. Geographically possible sequence of segment transactions (for example, northbound progression). 3. Transaction is part of the defined trip definition of the trip transaction 4. Allowable Trip/Segment travel time.	December 2019
LBR-XTB-07	Non-AVI Lane Transaction Association to a Trip Transaction	For vehicles with no transponder, the Lane Transactions will be associated to the same Trip if the license plate numbers are determined to be for the same vehicle.	December 2019
LBR-XTB-08	AVI Lane Transaction Association to a Trip Transaction	If a Transponder ID is detected at all Toll Segments during a vehicle's travel, a Trip Transaction will be formed based on the common Transponder ID.	December 2019
LBR-XTB-09	Hybrid Lane Transaction Association to a Trip Transaction	If the same Transponder ID is not detected at all Toll Segment, a Trip Transaction will be formed by mapping Transponder ID and license plate information from all the Lane Transactions. Transponder ID, if valid, will be associated to the Trip for billing purposes.	December 2019
LBR-XTB-10	Trip Type Assignment Hierarchy	Once is trip is fully formed, the type of trip will be based on the following hierarchy: 1. Presence of Valid Tag 2. Image Based Trip Note: all tags referenced above refer to Tolling Tags.	December 2019

Business Rule Number	Value/Term	Condition/Rule Description	Last Update/ Verification
LBR-XTB-11	Transaction Segments	If a Transaction Segment is received after the Trip for which the segment belongs is built, the transaction segment will be saved and reported, but not processed.	December 2019
LBR-XTB-12	Trip Toll Point Duplicate	A single trip cannot contain more than one transaction for each unique Toll Point/segment within the trip.	December 2019
LBR-XTB-13	Consolidation of Trips	No more than a single Trip Transaction shall be sent for processing for every unique Express Lane Trip. Each Trip Transaction is unique in composition – no two trips can contain the same transaction(s).	December 2019
LBR-XTB-14	Trip Definitions	The Central Host shall define a set of configurable Trip Definitions which specify the various combinations of Toll Segment transactions that can be included in a single Trip.	December 2019
LBR-XTB-15	Split Trips	If a customer exits the Express Lane and decides to re-enter after the configurable allowable travel time for the entire Travel Facility has passed, two separate trips shall be constructed and the Toll Rate from the initial entry is considered expired. Trips are formed through the detection and inclusion of transactions at each Toll Segment in a given Trip Definition. The occurrence of a transaction at Toll Segments within a given Trip Definition shall not be assumed; a valid transaction must be recorded at every Toll Point in the Trip Definition, otherwise the transactions will form separate Trips.	December 2019
LBR-XTB-16	Orphan Trips	If an image-based transaction cannot be identified by Optical Character Recognition (OCR)/Manual Image Review, the transaction will form a single point trip filtered as unidentifiable.	December 2019

2.2.5 Transaction Rating Business Rules

This section describes the business rules related to transaction rating.

Business Rule Number	Value/Term	Condition/Rule Description	Last Update/ Verification
LBR-XTR-01	Transaction Tag Status	Transponder status determined at the Central Host will be maintained throughout the life of the transaction until transmission to BOS.	December 2019

Business Rule Number	Value/Term	Condition/Rule Description	Last Update/ Verification
LBR-XTR-02	Trip Tag Status	If transponder-based trips contain transactions with both Valid and Invalid tag statuses, the Valid tag status will be applied to the trip.	December 2019
LBR-XTR-03	Toll Rate Assignment	The toll rate applied to a trip will be the toll rate seen by the customer at the first VTMS that applies to that trip definition, and this toll rate is locked for the duration of the trip.	December 2019
LBR-XTR-04	Sign Travel time	Sign Travel time will be used to calculate the time after a rate is posted for when the rate will become effective for billing. This time is configurable, and sign-based.	December 2019
LBR-XTR-05	Toll Rate Increase Implementation	A toll rate increase will go into effect after one of the following is met: 1. Two tags have been seen at both the sign tag reader and the plaza tag reader 2. Sign travel time has elapsed.	December 2019
LBR-XTR-06	Rate Decrease Implementation	A toll rate decrease will go into effect immediately after the rate is posted to the sign.	December 2019
LBR-XTR-07	Closed Pricing	The toll rate for a closed segment will be $0.00 (configurable).	December 2019
LBR-XTR-08	Open to All Pricing	The toll rate for an "FREE" segment will be $0.00 (Configurable).	December 2019

ATTACHMENT C: REPORT REQUIREMENTS

- Data Platform Release 3 Report Requirements v1.2

Statement of Work

**Data Platform Release 3
Report Requirements**

Version 1.2

March 16, 2022

Updated May 24, 2022

Table of Contents

Document Control

Date	Version	Author	Changes
3/16/2022	v. 1.0	Amy Aamold, Atkins	Initial Version
	v. 1.1	Amy Aamold, Atkins	• Global requirements updated • Agency and Product updated to reference Product Group • Report requirements updated following review with CTRMA and Deloitte
5/24/2022	v. 1.2	Amy Aamold, Atkins	• Global requirements updated

1. Overview

Reports are necessary for the validation of Release 3 databases and processes, and for integration and certification testing with other agencies and partners. Report samples are provided as an example of the existing reports. Where there are discrepancies between the description and the image, the description takes precedence.

Global reporting requirements are as follows:

1. Product Group selection should be for all or multiselect wherever possible.
2. Product selection should be for all or multi-select, associated with any selected Product Group.
3. Selected Report Criteria should be display on printed and downloaded details
4. Current system reports have a search box available to filter displayed results across any field (for example "519" will find transaction IDs, product names, license plate, dollar amounts, etc.) This existing functionality would be helpful.
5. All reports should be exportable to PDF, CSV, and Excel.
6. Selection criteria should be printed and exported at the top of every report.
7. The report run date and time should be printed and exported at the top of every report.

2. Transaction Search

Was delivered in Release 1-2. This should be tested in Release 3, but no changes have been requested.

3. CSC Pending Reconciliation

This is an existing report in the current system, presented as a sample. Key criteria and data elements are identified. This report includes four types or results, detailed below.

3.1.   CSC Pending Reconciliation: Summary Counts

Data Source	Real-Time Data
Report Criteria	• Transaction Date Range (Start Date, End Date, no times) • Product Group (All, Multi-select)
Summarization	Total transaction counts are provided for each of the statuses identified.
Report Results	• Total Unsubmitted Count • Total Recon Status "S" • Total Recon Status "N" • Total Recon Status "T" • Total Recon Status "C" • Total Recon Status "P" • Total Recon Status "D" • Total Recon Status "I" • Total Recon Status "O" • Total Transaction Status "T" (Tag) Total Transaction Status "I" (Image)

Example:

```
Total Unsubmitted Count: 70076
Total RECN Status 'S': 509
Total RECN Status 'N': 69567
Total RECN Status 'T': 0
Total RECN Status 'C': 0
Total RECN Status 'P': 0
Total Transaction Status 'T': 130
Total Transaction Status 'I': 69946
```

3.2.   CSC Pending Reconciliation: Product Group Counts

Data Source	Real-Time Data
Report Criteria	*Same report criteria and data is used as Summary Counts*
Summarization	Transaction Count is totaled per transaction date, reconciliation status, and transaction type.
Report Results	• Product Group *(existing report has Turnpike and Plaza)* • Transaction Date • Reconciliation Status • Transaction Type • Transaction Count *(calculated total)*

Example:

Turnpike	Plaza	Transaction Timestamp	Reconciliation Status	Count
US290 E	183 Entry	01/01/2022 CST	S	6
US290 E	183 Entry	01/01/2022 CST	S	1
US290 E	183 Entry	01/02/2022 CST	S	6
US290 E	183 Entry	01/02/2022 CST	S	1
US290 E	183 Entry	01/03/2022 CST	S	5
US290 E	183 Entry	01/03/2022 CST	S	1
US290 E	183 Entry	01/04/2022 CST	S	4
US290 E	183 Entry	01/05/2022 CST	S	7
US290 E	183 Entry	01/06/2022 CST	S	4
US290 E	183 Entry	01/06/2022 CST	S	2
US290 E	183 Entry	01/07/2022 CST	S	11
US290 E	183 Entry	01/07/2022 CST	S	1
US290 E	183 Entry	01/08/2022 CST	S	3
US290 E	183 Entry	01/09/2022 CST	S	5
US290 E	183 Entry	01/09/2022 CST	S	1

Showing 1 to 50 of 4,884 records   Previous 1 2 3 4 5 ... 98 Next

3.3.   CSC Pending Reconciliation: Transaction Level Detail

Data Source	Real-Time Data
Report Criteria	Transaction Date *Current functionality is to navigate to this report by selected a single day on the graphical heat map.*
Summarization	Sent Count is totaled per transaction id.
Report Results	• Transaction Endpoint *(existing report has Plaza ID and Lane)* • Transaction Date and Time • Transaction ID • Reconciliation Status • Last Sent Time *(time transaction was sent to the HUB)* • Last Received Time *(from the HUB)* • Sent Count *(calculated total)*

Example:

Plaza ID	Lane	Transaction Timestamp	Plaza Trx ID	Recon Status	Last Sent Time	Last Received Time	Sent Count	Transaction Type
2	14	02/28/2022 20:07:20 CST	2128713884	N	03/02/2022 02:04:08	03/02/2022 01:01:14	1	I
2	13	02/28/2022 23:38:29 CST	2128780789	N	03/02/2022 02:04:08	03/02/2022 01:01:14	1	I
2	13	02/28/2022 23:32:54 CST	2128779895	N	03/02/2022 02:04:08	03/02/2022 01:01:14	1	I
2	13	02/28/2022 23:31:22 CST	2128779580	N	03/02/2022 02:04:08	03/02/2022 01:01:14	1	I
2	13	02/28/2022 23:31:07 CST	2128779561	N	03/02/2022 02:04:08	03/02/2022 01:01:14	1	I
2	13	02/28/2022 23:29:00 CST	2128779188	N	03/02/2022 02:04:08	03/02/2022 01:01:14	1	I
2	13	02/28/2022 23:27:40 CST	2128778971	N	03/02/2022 02:04:08	03/02/2022 01:01:14	1	I
2	13	02/28/2022 23:26:53 CST	2128778830	N	03/02/2022 02:04:08	03/02/2022 01:01:14	1	I
2	13	02/28/2022 23:24:28 CST	2128778357	N	03/02/2022 02:04:08	03/02/2022 01:01:14	1	I
2	13	02/28/2022 23:24:03 CST	2128778280	N	03/02/2022 02:04:08	03/02/2022 01:01:14	1	I

Showing 1 to 10 of 63,751 entries   Previous | 1 | 2 | 3 | 4 | 5 | ... | 6376 | Next

3.4.   CSC Pending Reconciliation: Chronological Status

Data Source	Real-Time Data
Report Criteria	Hyperlink from Transaction ID in the CSC Pending Reconciliation: Transaction Level Detail
Summarization	None
Report Results	• Transaction Endpoint *(existing report has Plaza ID and Lane)* • Posted Date and Time • Reconciliation Date and Time • Status Description

Example:

2	13	02/28/2022 14:27:57 CST	2128209945	S	03/02/2022 06:04:15	03/02/2022 05:43:02	2	I

Chronological Status

Plaza	Lane	Posted	Reconciliation	Status
2	13		2022-02-28 14:27:57	Transaction Occurred - Tag: TEX.04297185
2	13		2022-02-28 20:48:17	Transaction sent to Image Review
2	13	2022-03-01 00:32:27	2022-03-01 00:32:27	Transaction received from Image Review
2	13		2022-03-01 02:00:02	iToll Transaction sent to IOPHUB for payment
2	13	2022-03-01 15:50:02	2022-03-01 20:48:40	System Failure - posting failed
2	13		2022-03-01 22:04:28	Transaction Resubmit to IOPHUB for payment
2	13	2022-03-02 03:43:04	2022-03-02 05:43:11	System Failure - posting failed
2	13		2022-03-02 06:04:18	Transaction Resubmit to IOPHUB for payment

2	13	02/28/2022 11:25:51 CST	2128022458	S	03/02/2022 06:04:15	03/02/2022 05:43:02	2	I

4. Pending Workflow Stages Report

Identify transactions that may not be proceeding through the workflow. This report provides a snapshot of transactions and their current state in the workflow. It helps to identify issues in the workflow.

Data Source	Real-Time Data
Report Criteria	Transaction Date Range (Start Date, End Date, no times)
Summarization	Data is summarized and reported by Receive Date *Receive Date = date transaction is received in DPS*

Report Results	• Receive Date
	• Total Received (count of transactions)
	• In Transit
	    ○ *DPS Workflow statuses displayed*
	• Rejected
	    ○ *DPS Workflow statuses displayed*
	• Posted
	    ○ *DPS Workflow statuses displayed*

Example:

Received Counts		In Transit							Reject				Posted	
Receive Date	Total Received	Queued for Image D/L	Queued for XLPR	Queued for Human Review	Queued for Posting	Queued for DMV Response	Queued for IOP File	Pending IOP Disposition	No Image Found	Codeoff in Image Review	Bad/No DMV Response	IOP Reject (Away on Home)	Home on Home Posted	Away on Home Posted
6/1/2017	1000	0	0	0	0	0	0	0	50	50	300	100	300	200
6/2/2017	1100	0	0	0	0	0	0	0	55	65	290	110	310	270
6/3/2017	1200	0	0	0	0	0	0	0	100	90	340	100	250	320
6/4/2017	1300	0	0	0	0	0	0	0	44	55	348	120	350	383
6/5/2017	1000	0	0	0	0	0	0	0	40	50	75	100	300	435
6/6/2017	1100	0	0	0	0	250	395	200	0	50	5	60	90	50
6/7/2017	1200	0	0	0	0	256	110	100	0	90	4	0	440	200
6/8/2017	1300	0	0	0	0	330	150	200	0	60	5	100	250	205
6/9/2017	1000	0	0	0	0	345	200	300	0	0	4	0	75	76
6/10/2017	1100	0	0	200	30	365	100	100	0	60	5	0	220	220
6/11/2017	1200	0	0	101	50	345	50	0	0	50	4	0	0	0
6/12/2017	1300	0	0	65	0	500	0	0	0	30	5	0	0	0
6/13/2017	1000	0	100	197	600	0	0	0	0	99	4	0	0	0
6/14/2017	1100	0	100	0	0	995	0	0	0	0	5	0	0	0
6/15/2017	1200	0	250	100	400	450	0	0	0	0	4	0	0	0
6/16/2017	1300	98	105	200	327	675	0	0	0	0	5	0	0	0
6/17/2017	1000	194	150	156	0	500	0	0	0	0	4	0	0	0
6/18/2017	1100	195	0	239	0	660	0	0	0	0	6	0	0	0
6/19/2017	1200	200	0	0	0	330	0	0	0	0	1	0	0	0
6/20/2017	1300	225	0	0	0	450	0	0	0	0	3	0	0	0
6/21/2017	1000	250	0	0	0	300	0	0	0	0	0	0	0	0
6/22/2017	1100	300	0	0	800	0	0	0	0	0	0	0	0	0
6/23/2017	1200	425	0	0	775	0	0	0	0	0	0	0	0	0
6/24/2017	1300	450	0	0	850	0	0	0	0	0	0	0	0	0
6/25/2017	1000	650	0	300	50	0	0	0	0	0	0	0	0	0
6/26/2017	1100	430	0	400	270	0	0	0	0	0	0	0	0	0
6/27/2017	1000	575	50	300	75	0	0	0	0	0	0	0	0	0
6/28/2017	1100	500	190	410	0	0	0	0	0	0	0	0	0	0
6/29/2017	1200	560	210	430	0	0	0	0	0	0	0	0	0	0
6/30/2017	1300	575	725	0	0	0	0	0	0	0	0	0	0	0

5. HUB Reconciliation

Existing Report: CSC Payment Reconciliation

Settlement details with CUSIOP. Captures date of valid response (typically the date/time we acknowledge the SRECON). Report shows what agencies owe to CTRMA.

Data Source	Real-Time Data

Report Criteria	• Transaction Date Range (Start Date, End Date, no times)
	• Date Type (Transaction Date or Reconciliation Date)
	    ○ Transaction Date – when it occurred in the lane
	    ○ Reconciliation Date – date CTRMA acknowledged the SRECON
	• Product Group (All, Multi-select)
	• Agency *(the agency that responded SRECON)*

Summarization	Data is summarized by Date and by Product Group

Report Results	• Tolls Posted/Paid (P status, transaction type T)
	    ○ Transaction count (summary total)
	    ○ Total Revenue
	    ○ Total Fee (Flat Fees + Percent Fee)
	• iTolls Posted/Paid (P status, transaction type I)
	    ○ Transaction count
	    ○ Total Revenue
	    ○ Total Fee (Flat Fees + Percent Fee)
	• Tolls and iTolls Paid – totals
	    ○ Total Count
	    ○ Total Revenue

Report Totals	• Tolls Posted/Paid Count • Tolls Posted/Paid Revenue • Tolls Posted/Total Fee • iTolls Posted/Paid Count • iTolls Posted/Paid Revenue • iTolls Posted/Paid Revenue • Tolls and iTolls Paid Count • Tolls and iTolls Paid Revenue • Tolls and iTolls Paid Fee

Example:

CSC Payment Reconciliation ⌄

Start Date: 02/01/2022 📅 End Date: 02/28/2022 📅 Date Type: RECNTMST ⌄ Turnpike: 183-A ⌄

Agency: TxDOT ⌄

📄 PDF 📄 CSV 📄 Excel 📄 Preview Report

Parameters - Date Type: RECNTMST   Turnpike: 183-A   Start Date: 02/01/2022   End Date: 02/28/2022   Agency: TxDOT

Display 50 ⌄ records per page   Search: [   ]

			Tolls Posted/Paid								ITolls Posted/Paid							Tolls and I
Date	Agency	Rev Date	Count	Rev	Invalid Count	Invalid Rev	N + 1 Count	N + 1 Rev	Flat Fees	Pctfee	Count	Rev	N + 1 Count	N + 1 Rev	Flat Fees	Pctfee	Count	Rev	N + 1 Count
02/01/2022	TxDOT		63,427	$78,216.65		$0.00	0	$0.00	$3,171.35	$2,648.69	4,194	$5,430.00		$0.00	$209.70	$182.08	67,621	$83,646.65	
02/02/2022	TxDOT		76,554	$96,686.92		$0.00	0	$0.00	$3,827.70	$3,259.28	7,414	$9,954.24		$0.00	$370.70	$331.78	83,968	$106,641.16	
02/03/2022	TxDOT		77,146	$96,981.50		$0.00	0	$0.00	$3,857.30	$3,268.25	16,116	$21,704.48		$0.00	$805.80	$723.18	93,262	$118,685.98	
02/04/2022	TxDOT		3,308	$3,985.23		$0.00	0	$0.00	$165.40	$136.46	942	$1,265.31		$0.00	$47.10	$42.32	4,250	$5,250.54	
02/05/2022	TxDOT		26,408	$31,908.52		$0.00	0	$0.00	$1,320.40	$1,085.54	3,229	$4,032.62		$0.00	$161.45	$136.52	29,637	$35,941.14	
02/06/2022	TxDOT		65,694	$80,283.15		$0.00	0	$0.00	$3,284.70	$2,721.01	7,968	$9,893.43		$0.00	$398.40	$333.83	73,662	$90,176.58	
02/07/2022	TxDOT		50,676	$61,653.48		$0.00	0	$0.00	$2,533.80	$2,093.39	6,056	$7,601.03		$0.00	$302.80	$257.08	56,732	$69,254.51	
02/08/2022	TxDOT		74,631	$94,429.99		$0.00	0	$0.00	$3,731.55	$3,183.61	16,632	$17,821.14		$0.00	$831.60	$653.42	91,263	$112,251.13	
02/09/2022	TxDOT		79,114	$100,714.95		$0.00	0	$0.00	$3,955.70	$3,391.42	6,212	$8,578.70		$0.00	$310.60	$284.88	85,326	$109,293.65	
02/10/2022	TxDOT		80,842	$103,305.31		$0.00	0	$0.00	$4,042.10	$3,475.74	7,921	$11,222.04		$0.00	$396.05	$371.14	88,763	$114,527.35	
02/11/2022	TxDOT		82,683	$105,717.39		$0.00	0	$0.00	$4,134.15	$3,555.53	10,899	$15,023.74		$0.00	$544.95	$498.63	93,582	$120,741.13	
02/12/2022	TxDOT		89,000	$113,027.24		$0.00	0	$0.00	$4,450.00	$3,803.51	18,556	$24,999.32		$0.00	$927.80	$833.14	107,556	$138,026.56	
Total			1,853,496	$2,328,003.46					$92,674.80	$78,581.09	243,210	$321,054.34			$12,160.50	$10,776.45	2,096,706	$2,649,057.80	

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6. Reconciliation Summary

Provides a summary view of transactions by month as they proceed through the workflow process.

Data Source	Summarized Data (possibly daily summary)
Report Criteria	- Product Group - Transaction Date Range (Start Date, End Date, no times) - Summarization Level (Month or Day)
Summarization	Data is summarized by Month and by Product Group
Report Results	- Product Group - Month (Mon-YY) - Lane –total number of transactions recorded by the ETCS. Source data in current PHS reports is the "Transaction Summary Report" - AVI – total number of transactions recorded by the ETCS with a valid "V" transponder status - PBM – total number of transactions recorded by the ETCS with a invalid "Z", "I" or no transponder status - Total – total number of AVI and PBM transactions recorded by the ETCS - AVI – total number of transactions processed through CUSIOP and received payment (posted). Source data in current PHS reports is the "Payment Reconciliation" - Toll – total number of transactions posted through CUSIOP as valid transponder reads - Toll Dupes – total number of transactions rejected as transponder-based duplicates - Toll % - total transactions that are processed as valid CUSIOP transponder reads compared to Lane Total transactions - AVI Difference – difference between the Lane-AVI total and AVI-Toll totals representing the number of valid status transponders submitted to CUSIOP and not posted - iToll – total number of transactions posted through CUSIOP as valid plate reads - iToll Dupes – total number of transactions rejected as plate duplicates - iToll % - total number of transactions processed as valid CUSIOP plates compared to Lane PBM transactions - SCORR – total number of transactions processed and posted with a SCORR file - True Penetration – percentage of all transactions that have either valid CUSIOP accounts (transponder + plate) - Image Review - number of transactions in image review and current pending image review backlog - Pending Image – total number of transactions received by the ETCS where no associated image has been retrieved by the DPS - Image unavailable – total number of transactions where no image has been retrieved from the ETCS after 30 days. - PBM Images Sent – total number of transactions sent to image review by the ETCS

- o PBM Images Received – total number of transactions that have received image review results (license plate extracted or code-offs)
- o Image review pending / Image Review backlog – total number of transactions sent to image review and pending image review results.
- Filters
  - o PBM Filtered Duplicates – total number of transactions where a duplicate status was received from PBM (PRECON disposition = "D")
  - o Buffered Tag Reads – total number of transactions marked as a buffered tag status by the ETCS
  - o Spurious Tag reads – total number of transactions marked as a spurious tag status by the ETCS
  - o Do Not Pursue – total number of transactions marked as Do Not Pursue (permanent hold)

- Non-Revenue
  - o NR Plate – total transactions processed as non-revenue (exempt) based on plate
  - o NR Tag – total transactions processed as non-revenue (exempt) based on tag
  - o NR Total – total number of tag and plate transactions processed as non-revenue (exempt)
  - o NR Plate % - percentage of lane PBM transactions processed as non-revenue (exempt) plate compared to Lane transactions
  - o NR Tag % - percentage of lane AVI transactions processed as non-revenue (exempt) tag compared to Lane AVI
- Code Offs
  - o Preventable – transactions with a code-off result classified as "System based or caused" (unclear image, missing images, blurry image, etc.)
  - o Preventable % - percentage of Lane PBM transactions with a preventable code off result
  - o Non-Preventable – transactions with a code-off results classified s "Vehicle based or caused" (missing plate, blocked plate, etc.)
  - o Non-Preventable % - percentage of Lane PBM transactions with a non-preventable code off result
  - o Total – total number of transactions that received a preventable or non-preventable code-off results
  - o % Coded Off – percentage of transactions that received a preventable or non-preventable code-off results compared to Lane PBM transactions
- Placements
  - o To PBM – transactions submitted to PBM
  - o From PBM – transactions that have received a Phase I disposition from PBM
  - o PBM Pending – transactions that have not received a Phase I disposition from PBM
- Total
  - o Processed – transactions processed as AVI, iToll, Non-Revenue, PBM, Code-offs
  - o Other Processed – transactions held or halted by filters (duplicates, Do Not Pursue, etc.)

	• o Unprocessed – Difference between Lane Total transactions and total processed and other processed. o Unprocessed % - Difference between unprocessed and Lane Total transactions • Zerofare – transactions processed with a $0.00 toll amount. (excluding Non-Revenue • Status_C – Transactions with a status "C" (plate not found) response from CUSIOP
Report Totals	• All columns are totaled

Example:

Reconciliation Summary ⌄

Turnpike: All ⌄   Year: 2022 ⌄

PDF   CSV   Excel   Preview Report

Parameters - Turnpike: 183-A/US290 E/SH550/Toll 49/Loop 375/MoPac/MoPac TRIPS/SH-71/45 SW/183-S   Year: 2022

Display 50 ⌄ records per page   Search: _____

		Lane							AVI						Image Review				Filters			
Turnpike	Month	AVI	PBM	Total	Toll	Toll Dupes	Toll %	AVI Difference	I-Toll	I-Toll Dupes	I-Toll %	$CORR	True Penetration	Pending Image	PBM Images Sent	PBM Images Received	Delta	PBM Filtered Duplicates	Buffered Tag Reads	DNP	Other Du
183-A	Jan	2,430,328	2,516,129	4,946,457	2,390,177	0	48.32%	40,151	434,476	0	8.78%	4,534	57.10%	489	2,504,529	2,504,529	0	247	0	0	
183-A	Feb	2,334,407	2,410,187	4,744,594	2,287,545	0	48.21%	46,862	415,992	0	8.77%	47,406	56.98%	275	2,399,453	2,397,578	1,875	240	0	0	
183-A	Mar	97,244	99,447	196,691	0	0	0.00%	97,244	0	0	0.00%	1,955	0.00%	2	90,833	74,879	15,954	1	0	0	
NETRMA-Raytheon	Jan	49,834	40,084	89,918	49,759	0	55.34%	75	9,833	0	10.94%	46	66.28%	9	40,013	40,013	0	2	0	0	
NETRMA-Raytheon	Feb	46,403	36,927	83,330	46,223	0	55.47%	180	8,436	0	10.12%	571	65.59%	17	36,867	36,834	33	6	0	0	
NETRMA-Raytheon	Mar	2,110	1,726	3,836	0	0	0.00%	2,110	0	0	0.00%	18	0.00%	1	1,619	1,351	268	0	0	0	
NETRMA	Jan	482,175	528,118	1,010,293	479,574	0	47.47%	2,601	107,995	0	10.69%	790	58.16%	1,506	526,399	525,821	578	10,517	0	0	
NETRMA	Feb	445,334	482,760	928,094	442,248	0	47.65%	3,086	94,185	0	10.15%	4,865	57.80%	1,982	480,560	479,440	1,120	9,301	0	0	
NETRMA	Mar	18,121	19,655	37,776	0	0	0.00%	18,121	0	0	0.00%	251	0.00%	824	17,877	15,053	2,824	14	0	0	
SH550	Jan	95,327	68,122	163,449	65,707	0	40.20%	29,620	33,231	0	20.33%	23,434	60.53%	192	0	0	0	6	0	0	
SH550	Feb	58,076	49,058	107,134	40,077	0	37.41%	17,999	25,084	0	23.41%	14,087	60.82%	8	0	0	0	6	0	0	
US290 E	Jan	1,192,748	1,722,293	2,915,041	1,178,851	0	40.44%	13,897	272,246	0	9.34%	2,047	49.78%	17	1,717,269	1,717,269	0	362	0	0	
US290 E	Feb	1,168,997	1,672,703	2,841,700	1,150,932	0	40.50%	18,065	263,857	0	9.29%	26,309	49.79%	12	1,667,870	1,666,565	1,305	314	0	0	
US290 E	Mar	49,260	71,059	120,319	0	0	0.00%	49,260	0	0	0.00%	1,704	0.00%	7	65,301	54,149	11,152	3	0	0	
MoPac	Jan	321,609	343,949	665,558	0	0	0.00%	321,609	0	0	0.00%	0	0.00%	0	0	0	0	0	0	0	
		13,392,222	17,115,074	30,507,296	12,215,346	137	40.04%	1,176,876	2,757,427	29	9.04%	183,925	49.08%	7,130	15,654,842	15,595,090	59,752	22,120	0	614	

Showing 1 to 20 of 28 records   Previous 1 Next

7. Pay By Mail Reconciliation Report

Existing Report: CSC Placement Reconciliation.

Confirm what was sent to Pay by Mail and see the dispositions of those transactions across various statuses.

Sent Date is the date CTRMA submitted the transactions to Pay by Mail system (regardless of transaction date).

Transaction Date is the date the transaction occurred on the roadway.

IOP Reject Phase 1 Responses are the responses from the PRECON, in columns based on the response received. Sent should equal the total of Accepted, Duplicate, Too Old, Missing Image, and Format Error.

IOP Reject Phase 2 Responses should equal the total of the Accepted column, with the additional of an Unpaid column. (Paid, Waived, Discounted, AVI, Unpaid).

Placement Phase 1 Responses are the transactions sent from CTRMA to PBM. Sent should equal the total of Accepted, Duplicate, Too Old, Missing Image, and Format Error.

Placement Phase 2 Responses should equal the total of the Accepted column, with the additional of an Unpaid column. (Paid, Waived, Discounted, AVI, Unpaid).

Data Source	Real-Time Data
Report Criteria	• Transaction Date Range (Start Date, End Date, no times)Date Type (Transaction Date or Sent Date) • Product Group (All, Multi-select)
Summarization	Summarized by Date (Transaction or Sent)

Report Results	IOP Reject Table
	• Product Group
	• Date (Transaction or Sent Date, based on selection)
	• Sent (Count of transactions sent)
	• IOP Reject Phase 1 Responses
	    ○ Accepted count
	    ○ Duplicate count
	    ○ Too old count
	    ○ Missing image count
	    ○ Format error
	• IOP Reject Phase 2 Responses
	    ○ Paid
	    ○ Waived
	    ○ Discounted
	    ○ Reduced payment (paid AVI)
	    ○ Unpaid
	
	PBM Table
	• Product Group
	• Date

	• Sent
	• PBM Phase 1 Responses
	   ○ Accepted count
	   ○ Duplicate count
	   ○ Too old count
	   ○ Missing image count
	   ○ Format error
	• PBM Phase 2 Responses
	   ○ Paid
	   ○ Waived
	   ○ Discounted
	   ○ Reduced payment (paid AVI)
	   ○ Unpaid

Report Totals	n/a

Example report provided. This report example has known errors. The descriptions above represent the intention of the report.

CSC Placement Reconciliation ⌄

Start Date: 02/01/2022   End Date: 02/28/2022   Date Type: SENTDATE ⌄   Turnpike: 7 selected ⌄
    TRANSTMST
    SENTDATE

📄 PDF   📄 CSV   📄 Excel   📄 Preview Report

Parameters - Date Type: SENTDATE   Turnpike: 183-A/US290 E/Toll 49/MoPac TRIPS/SH-71/45 SW/183-S   Start Date: 02/01/2022   End Date: 02/28/2022

Display 50 ⌄ records per page   Search: [   ]

			IOP Reject Phase 1 Responses					IOP Reject Phase 2 Responses			
Turnpike	Date	Sent	Accepted	Duplicate	Too Old	Missing Image	Format Error	Paid	Waived	Discounted	AVI
SH-71	02/16/2022	0	0	0	0	0	0	735	0	0	0
SH-71	02/17/2022	0	0	0	0	0	0	1,178	0	0	0
SH-71	02/18/2022	0	0	0	0	0	0	699	0	0	0
SH-71	02/20/2022	0	0	0	0	0	0	194	0	0	0
SH-71	02/21/2022	0	0	0	0	0	0	187	0	0	0
SH-71	02/22/2022	0	0	0	0	0	0	361	0	0	0
SH-71	02/23/2022	0	0	0	0	0	0	627	0	0	0
SH-71	02/24/2022	0	0	0	0	0	0	1,772	0	0	0
SH-71	02/25/2022	0	0	0	0	0	0	560	0	0	0
SH-71	02/26/2022	0	0	0	0	0	0	447	0	0	0
SH-71	02/27/2022	0	0	0	0	0	0	115	0	0	0
SH-71	02/28/2022	0	0	0	0	0	0	4,071	0	0	0
US290 E	02/01/2022	0	0	0	0	0	0	4,101	0	0	0
US290 E	02/02/2022	0	0	0	0	0	0	3,476	0	0	0
US290 E	02/03/2022	0	0	0	0	0	0	4,456	0	0	0
US290 E	02/04/2022	0	0	0	0	0	0	3,240	0	0	0
US290 E	02/05/2022	0	0	0	0	0	0	6,058	0	0	0

Showing 151 to 189 of 189 records   Previous 1 2 3 **4** Next

Turnpike	Date	Sent	Placement Phase 1 Responses					Placement Phase 2 Responses			
			Accepted	Duplicate	Too Old	Missing Image	Format Error	Paid	Waived	Discounted	AVI
183-A	02/01/2022	45,639	39,007	0	0	0	6	40,443	15	0	515
183-A	02/02/2022	45,872	47,257	0	0	0	6	37,140	15	0	512
183-A	02/03/2022	12,122	41,714	0	0	0	13	28,067	148	0	595
183-A	02/04/2022	46,380	34,441	0	0	0	11	30,161	15	0	321
183-A	02/05/2022	38,004	22,864	0	0	0	6	57,308	18	0	772
183-A	02/06/2022	35,206	40,117	0	0	0	3	17,410	6	0	242
183-A	02/07/2022	43,177	33,199	0	0	0	5	16,332	5	0	446
183-A	02/08/2022	45,353	48,139	0	0	0	6	91,138	32	0	816
183-A	02/09/2022	48,729	47,495	0	0	0	5	42,758	12	0	569
183-A	02/10/2022	47,932	49,424	0	0	0	5	37,815	10	0	519
183-A	02/11/2022	51,191	49,801	0	0	0	5	48,048	49	0	1,731
183-A	02/12/2022	57,030	52,162	0	0	0	4	122,252	48	0	2,100
183-A	02/13/2022	38,119	49,201	0	0	0	5	15,562	15	0	451
183-A	02/14/2022	45,024	37,637	0	0	0	3	13,780	12	0	625
183-A	02/15/2022	47,605	49,405	0	0	0	5	41,191	12	0	513
183-A	02/16/2022	50,607	48,749	0	0	0	6	37,437	11	0	545
183-A	02/17/2022	46,577	47,902	0	0	0	4	64,750	20	0	1,070

Showing 1 to 50 of 196 records

Previous 1 2 3 4 Next

8. Non-Revenue by Agency

Report provides total transaction count and waived toll amount for transactions related to the Exempt List.

Data Source	Real-Time Data
Report Criteria	• Date Range (Start Date, End Date, no times) by Transaction Date • Product Group (All, Multi-select)
Summarization	Summarize by Agency and Exempt Type (Plate or Tag)
Report Results	• Agency Name • Transaction Type (from the transaction – plate or tag) • Total Transaction Count o Hyperlink on Trx Count to show detailed transactions with the ability to download the results. • Total Revenue Waived

Non Revenue by Agency

Start Date: 02/01/2022 End Date: 02/28/2022 Turnpike: 183-A

PDF CSV Excel Preview Report

Parameters - Turnpike: 183-A   Start Date: 02/01/2022   End Date: 02/28/2022

Display 50 records per page   Search:

Agency	Exempt Type	Trx Count	Total Toll
Acadian Ambulance Service	Plate	344	$638.53
Acadian Ambulance Service	Tag	9	$13.08
Allegiance Ambulance	Plate	139	$265.26
Alvin Police Department	Plate	4	$6.90
American Medical Response	Plate	387	$725.62
Austin Community College District Campus Police	Plate	95	$153.83
Austin EMS	Plate	484	$849.84
Austin Fire Department	Plate	472	$778.53
Austin ISD Police	Plate	686	$1,194.59
Austin Office of Medical Director	Plate	36	$62.62
Austin Police Department	Plate	5,934	$10,241.71
Bastrop County Sheriff	Plate	11	$19.90
Brazoria County Sheriff's Office	Plate	6	$10.48
Brazos County Sheriff's Office	Plate	3	$5.24
Burnet County Sheriff's Office	Plate	67	$122.70
Burnet Fire Department	Plate	110	$193.15
Burnet Police Department	Plate	76	$134.47
Total:		96,887	$138,996.70

Showing 1 to 50 of 133 records

Previous 1 2 3 Next

9. Transaction Summary

Axle Count is the original count at the time of capture and should not change if the axle count is adjusted.

Data Source	Real-Time Data
Report Criteria	- Transaction Date - Product Group (All, Multi-select) - Product (All, Multi-select, based on products associated with the selected Product Group) - Direction of Travel - Weekdays, Weekends, All Week - Reporting Range - Transaction Day - Transaction Day's Week – summarizes all data by day for the week pertaining to the Revenue Date selected - Transaction Day's Month – summarizes all data by day for the month pertaining to the Revenue Date selected - Transaction Day's Year – summarizes all data by day for the calendar year to the Revenue Date selected (ytd) - Transaction Day's Fiscal Year – summarizes all data by day for the fiscal year to the Revenue Date selected (July – June, ytd)
Summarization	Data is summarized by Product Group and by Day
Report Results	First Table - Product Group *(Agency, Location, Plaza in current report)* - Transaction Date - AVI Count 2 Axle 3 Axle 4 Axle 5 Axle 6 Axle 7+ Axle - Total - PBM Count 2 Axle 3 Axle 4 Axle 5 Axle 6 Axle 7+ Axle - Total - Total Count Second Table - Product Group *(Agency, Location, Plaza in current report)*

- Transaction Date
- AVI Revenue
  - 2 Axle
  - 3 Axle
  - 4 Axle
  - 5 Axle
  - 6 Axle
  - 7+ Axle
  - Total
- PBM Revenue
  - 2 Axle
  - 3 Axle
  - 4 Axle
  - 5 Axle
  - 6 Axle
  - 7+ Axle
  - Total
- Total Count

Example

Transaction Summary ⌄

Revenue Date: 03/02/2022 📅   Turnpike: 183-A ⌄   Plaza: All ⌄   Select reporting range: Revenue Date's Year ⌄

[📄 PDF] [📄 CSV] [📄 Excel] [📄 Preview Report]

Parameters - Turnpike: 183-A   Plaza: Brushy Creek NB/Brushy Creek SB/Crystal Mainline/Crystal Parkway NB/Crystal Parkway SB/Lakeline Plaza NB/Lakeline Plaza SB/Park Street Mainline/Scottsdale Drive NB   Revenue Date: 03/02/2022   Reporting range: Yearly

Display 50 ⌄ records per page   Search: [   ]

| Plaza | | | | AVI Revenue | | | | | | | PBM Revenue | | | | | | | Total Rev |
Agency	Location	Plaza	Date	2	3	4	5	6	7+	Total	2	3	4	5	6	7+	Total	Total Rev
CTRMA	183-A	Brushy Creek NB	01/01	$652.74	$3.96	$0.00	$2.64	$0.00	$0.00	$659.34	$908.82	$3.96	$8.91	$0.00	$0.00	$0.00	$921.69	$1,581.03
CTRMA	183-A	Brushy Creek SB	01/01	$419.76	$1.32	$3.96	$0.00	$0.00	$0.00	$425.04	$693.99	$1.98	$5.94	$0.00	$0.00	$0.00	$701.91	$1,126.95
CTRMA	183-A	Crystal Mainline	01/01	$15,076.11	$171.36	$381.99	$238.00	$11.90	$5.95	$15,885.31	$24,909.64	$196.90	$408.12	$264.92	$0.00	$0.00	$25,779.58	$41,664.89
CTRMA	183-A	Crystal Parkway NB	01/01	$107.16	$0.00	$2.82	$1.88	$0.00	$0.00	$111.86	$156.91	$1.42	$4.26	$0.00	$0.00	$0.00	$162.59	$274.45
CTRMA	183-A	Crystal Parkway SB	01/01	$93.06	$0.00	$1.41	$0.00	$0.00	$0.00	$94.47	$125.67	$0.00	$4.26	$0.00	$0.00	$0.00	$129.93	$224.40
CTRMA	183-A	Lakeline Plaza NB	01/01	$4,499.34	$32.24	$70.68	$76.88	$0.00	$0.00	$4,679.14	$7,226.18	$52.08	$97.65	$89.28	$0.00	$0.00	$7,465.11	$12,144.25
CTRMA	183-A	Lakeline Plaza SB	01/01	$3,806.18	$44.64	$106.02	$62.00	$6.20	$6.20	$4,031.24	$6,143.58	$74.40	$100.44	$70.68	$0.00	$4.65	$6,393.75	$10,424.99
CTRMA	183-A	Park Street Mainline	01/01	$30,947.28	$315.84	$660.24	$436.80	$0.00	$8.40	$32,368.56	$50,624.28	$453.60	$703.88	$493.92	$0.00	$0.00	$52,274.88	$84,643.44
CTRMA	183-A	Scottsdale Drive NB	01/01	$275.22	$1.32	$0.00	$2.64	$0.00	$0.00	$279.18	$425.70	$0.00	$2.97	$0.00	$0.00	$0.00	$428.67	$707.85
CTRMA	183-A	Brushy Creek NB	01/02	$687.20	$0.00	$1.98	$0.00	$0.00	$0.00	$609.18	$892.98	$1.98	$5.94	$0.00	$0.00	$0.00	$900.90	$1,510.08
CTRMA	183-A	Brushy Creek SB	01/02	$410.52	$0.00	$0.00	$5.28	$0.00	$0.00	$415.80	$631.62	$3.96	$2.97	$7.92	$0.00	$0.00	$646.47	$1,062.27
CTRMA	183-A	Crystal Mainline	01/02	$15,301.02	$149.94	$396.27	$333.20	$0.00	$0.00	$16,180.43	$25,244.37	$175.42	$553.11	$386.64	$0.00	$0.00	$26,359.54	$42,539.97
CTRMA	183-A	Crystal Parkway NB	01/02	$90.24	$0.94	$1.41	$0.00	$0.00	$0.00	$92.59	$146.26	$0.00	$2.13	$0.00	$0.00	$0.00	$148.39	$240.98
CTRMA	183-A	Crystal Parkway SB	01/02	$98.70	$0.00	$0.00	$0.00	$0.00	$0.00	$98.70	$142.00	$0.00	$4.26	$0.00	$0.00	$0.00	$146.26	$244.96
CTRMA	183-A	Lakeline Plaza NB	01/02	$4,364.80	$17.36	$52.08	$111.00	$0.00	$0.00	$4,545.24	$7,108.92	$42.78	$122.76	$111.60	$0.00	$4.65	$7,390.71	$11,935.95
CTRMA	183-A	Lakeline Plaza SB	01/02	$4,258.16	$48.36	$100.44	$129.00	$21.70	$3.10	$4,560.76	$6,435.60	$74.40	$170.19	$104.16	$32.55	$0.00	$6,816.90	$11,377.66
		Total		$5,645,115.75	$123,514.10	$204,538.53	$246,176.88	$19,361.55	$7,968.50	$6,246,675.31	$8,711,905.86	$221,845.76	$418,530.84	$521,506.68	$40,566.95	$11,519.10	$9,925,875.19	$16,172,550.50

Showing 1 to 50 of 549 records   Previous **1** 2 3 4 5 … 11 Next

June 29, 2022
AGENDA ITEM #7

Discuss and consider approving an agreement with Deloitte Consulting, LLP for toll operations and maintenance services related to the Mobility Authority's Data Platform System

Strategic Plan Relevance:	Explore and Invest in Transformative Technology and Adopt Industry Best Practices; Deliver Multi-faceted Mobility Solutions; Invest in Effort that Extends Beyond Roadways
Department:	Operations
Contact:	Tracie Brown, Director of Operations a Greg Mack, Assistance Director of IT & Toll Systems
Associated Costs:	$1,492,450
Funding Source:	FY23 Operating Budget
Action Requested:	Consider and act on draft resolution

Project Background: To provide more flexibility in the future, in March 2021, the Mobility Authority awarded a contract to Deloitte Consulting LLP (Deloitte) to develop a system wherein all toll transaction processing and data management capabilities after the point of transaction creation are advanced to a Mobility Authority-managed solution. The Data Platform System (DPS) is the next step in the agency's evolution to a mature toll entity that controls transaction pricing and revenue recognition timing. The DDPS will also provide the Authority with more insight into its transactional data, providing the ability to make better informed decisions regarding collection initiatives, transportation improvements, and other planning efforts.

Project Description: As stated above, the objective of the DPS is to transition all toll transaction data processing and data management capabilities after the point of transaction creation to a Mobility Authority-managed solution. Kapsch and ETC, the Authority's lane vendors, will collect the toll transaction at the roadside and forward the transaction and vehicle images to the DPS. Business logic will then consume the

transaction and route the data to either the Central United States Interoperability (CUSIOP) Hub or the Pay by Mail (PBM) vendor for payment. The payment status is ultimately passed back to the DPS allowing complete reconciliation of all the Authority's toll transactions.

Development for the first two project releases was completed September 2021 on schedule. These releases created the base code as well as the routing and exchange processes. Release 3 supports development for pricing and billing transactions, defining how data governance is handled in the new processing schema, and identifying the suite of reports necessary to account for the agency's revenue and monitor performance. Release 3 is anticipated to be completed in July 2022. The DPS is projected to go-live in November 2022, after a period of time in which the DPS will run in parallel to the current processing system.

The Mobility Authority will need support to monitor the system and reconciliation processes. Today's action is directly related to the engagement of those resources.

Summary of Action Requested: The Tolling Operations Management Solution ("TOMS") is a function of the DPS that aggregates multiple integrated solutions to support the Mobility Authority's transaction-to-cash lifecycle. TOMS automates business processes across several functional areas to accomplish this task. The TOMS functional areas are Application Support & Maintenance, Database Maintenance, Data Exchange Maintenance, Reporting & Analytics Maintenance and Support & Triage Management.

The Statement of Work (SOW) outlines the suite of services necessary to support and maintain the successful daily availability, capacity, and functionality of the integrated TOMS architecture. The SOW also defines the services, performance level, required capabilities and estimated hours for each area. Finally, the SOW provides the ability to engage one or more tolling operations support staff to assist with the end-to-end business processes managed within the TOMS.

Per the Authority's Policy Code, staff utilized the Texas Department of Information Resource's (DIR) deliverable-based information technology services contract with Deloitte to obtain a response to the SOW. The response meets the required operations and maintenance performance levels. Deloitte's response also provides the opportunity for up to two support staff. In considering Deloitte's response, staff noted that Deloitte

would be in the best position to correct any defects or improve performance since they developed the code base.

The initial term of the SOW is 12 months. During this period staff will monitor Deloitte's work while also assessing the processes and resources required to manage TOMS. This information will facilitate the development of a longer-term support and staffing plan. This long-term vision will consider the Authority's future as expands its suite of offerings to end users. This plan will be presented to the Board for action in Spring 2024.

Deloitte's **fee for supporting the Authority's TOMS is $1,492,450**, payable in monthly amounts of $124,370. The agreement is covered by Deloitte's overarching agreement with DIR which provides protections for performance failures and termination provisions if needed.

Previous Actions: An initial contract for the development of DPS Releases 1 & 2 was awarded to Deloitte in February 2021; the contract was subsequently approved in March 2021. A contract for the development of Release 3 was awarded to Deloitte in September 2021. Staff anticipates bringing forth a separate SOW for Release #4 in July 2021 as well as work authorization to support any needed system enhancements.

Financing: FY 2023 Operating Budget (GL Code 74176)

Staff Recommendation: Staff recommends approving an agreement with Deloitte Consulting LLP for toll operations and maintenance services related to the Mobility Authority's Data Platform System.

Backup provided: Draft Resolution
CTRMA TOMS Operations and Maintenance Statement of Work *(dated 6/9/22)*
Deloitte Consulting Response to the TOMS Operations and Maintenance Statement of Work *(dated 6/13/22)*
DIR Public Records Act Agreement – Deloitte Consulting TOMS Statement of Work
DIR Vendor Agreement – Deloitte Consulting TOM Statement of Work

**GENERAL MEETING OF THE BOARD OF DIRECTORS
OF THE
CENTRAL TEXAS REGIONAL MOBILITY AUTHORITY**

RESOLUTION NO. 22-0XX

**APPROVING AN AGREEMENT WITH DELOITTE CONSULTING LLP FOR TOLL
OPERATIONS AND MAINTENANCE SERVICES RELATED TO THE DATA
PLATFORM SYSTEM**

WHEREAS, Mobility Authority staff is developing a data platform to transition all toll transaction data processing and data management capabilities after the point of transaction creation from a third-party vendor to the Mobility Authority (the "Data Platform System"); and

WHEREAS, a Mobility Authority managed data platform will support new business capabilities such as external reporting, data analytics and a connection to the Texas Department of Motor Vehicles' datasets to allow better informed agency decision making; and

WHEREAS, by Resolution No. 21-018, dated March 31, 2021, the Board of Directors approved a contract with Deloitte Consulting LLP for the first and second releases of the Data Platform System to establish the data platform and create the routing and exchange processes; and

WHEREAS, by Resolution No. 21-059, dated September 29, 2021, the Board of Directors approved a contract with Deloitte Consulting LLP for the third release of the Data Platform System to support development for pricing and billing transactions, define how data governance is handled in the new processing schema, and identify the suite of reports necessary to account for the Mobility Authority's revenue and monitor performance for an amount not to exceed $2,069,364 including ten percent project contingency; and

WHEREAS, the Data Platform System is projected to go-live in November 2022, after a period of time in which it will run in parallel to the current processing system; and

WHEREAS, the Mobility Authority desires support to monitor the Data Platform System and reconciliation processes through a Tolling Operations Management Solution ("TOMS") as a function of the Data Platform System which aggregates multiple integrated solutions including Application Support & Maintenance, Database Maintenance, Data Exchange Maintenance, Reporting & Analytics Maintenance and Support & Triage Management, to support the Mobility Authority's transaction-to-cash lifecycle; and

WHEREAS, the Executive Director has negotiated a scope of work with Deloitte Consulting LLP in an amount not to exceed $1,492,450 for a TOMS as a function of the Data Platform System which is attached hereto as Exhibit A; and

WHEREAS, pursuant to Texas Government Code Section 2054.0565 and Mobility Authority Policy Code Section 401.008, the Mobility Authority may utilize procedures established by the

Texas Department of Information Resources (DIR) to procure goods and services through DIR cooperative contracts; and

WHEREAS, the Executive Director recommends entering into an agreement with Deloitte Consulting LLP for a TOMS as a function of the Data Platform System in an amount not to exceed $1,492,450 through their DIR cooperative contract.

NOW THEREFORE BE IT RESOLVED that the Board of Directors hereby approves the scope of work for a Tolling Operations Management Solution as a function of the Data Platform System which is attached hereto as Exhibit A; and

BE IT FURTHER RESOLVED, that the Executive Director is authorized to enter into an agreement with Deloitte Consulting LLP in an amount not to exceed $1,492,450 through their cooperative contract with the Texas Department of Information Resources for the first phase of the Data Platform System.

Adopted by the Board of Directors of the Central Texas Regional Mobility Authority on the 29th day of June 2022.

Submitted and reviewed by: Approved:

_____   _____
James M. Bass   Robert W. Jenkins, Jr.
Executive Director   Chairman, Board of Directors

Exhibit A

DIR Vendor Agreement

This is to signify that the Central Texas Regional Mobility Authority and Deloitte Consulting LLP Corporation have entered into an Agreement **in an amount not to exceed $1,492,450.00** pursuant to Texas Government Code Section 2054.0565 utilizing Texas Department of Information Resources Contract No. #DIR-CPO-4919 for the deliverable-based information technology services described in this proposal. All terms and conditions of Texas Department of Information Resources Contract No. #DIR-CPO-4919 are applicable to and made part of this agreement.

DELOITTE CONSULTING LLP

CENTRAL TEXAS REGIONAL MOBILITY AUTHORITY

_____

_____

Uday Katira, Managing Director
Deloitte Consulting LLP

James Bass
Executive Director

06/17/2022
_____

_____

Date

Date

Public Records Act Agreement

Contractor acknowledges and agrees that all records, documents, drawings, plans, specifications and other materials in the Authority's possession, including materials submitted by Contractor, are subject to the provisions of the Texas Public Information Act (see Texas Government Code § 552.001). Contractor shall be solely responsible for all determinations made by it under such law, and for clearly and prominently marking each and every page or sheet of materials with "Trade Secret" or "Confidential", as it determines to be appropriate. Contractor is advised to contact legal counsel concerning such law and its application to Contractor.

If any of the materials submitted by the Contractor to the Authority are clearly and prominently labeled "Trade Secret" or "Confidential" by Contractor, the Authority will endeavor to advise Contractor of any request for the disclosure of such materials prior to making any such disclosure. Under no circumstances, however, will the Authority be responsible or liable to Contractor or any other person for the disclosure of any such labeled materials, whether the disclosure is required by law, or court order, or occurs through inadvertence, mistake or negligence on the part of the Authority or its officers, employees, contractors or consultants.

In the event of litigation concerning the disclosure of any material marked by Contractor as "Trade Secret" or "Confidential," the Authority's sole obligation will be as a stakeholder retaining the material until otherwise ordered by a court, and Contractor shall be fully responsible for otherwise prosecuting or defending any action concerning the materials at its sole cost and risk; provided, however, that the Authority reserves the right, in its sole discretion, to intervene or participate in the litigation in such manner as it deems necessary or desirable. All costs and fees, including reasonable attorneys' fees and costs, incurred by the Authority in connection with any litigation, proceeding or request for disclosure shall be reimbursed and paid by Contractor.

DELOITTE CONSULTING LLP   **CENTRAL TEXAS REGIONAL**
                                               MOBILITY AUTHORITY

_____   _____
Uday Katira, Managing Director   James Bass
Deloitte Consulting LLP   Executive Director

06/17/2022_____   _____
Date   Date

Deliverables-based Information Technology Services (DBITS)

DIR-CPO-4919

Pursuant to above DBITS contract, the following terms will be applicable for TOMS Operations and Maintenance SOW.

Limitation of Liability

- Vendor shall not be liable for any claims, liability or expenses arising under or related to this Purchase Order ("Claims") for an aggregate amount in excess of two-times (2x) the total value of the Purchase Order. Such value includes all amounts paid and amounts to be paid over the life of the Purchase Order to Vendor by such Customer as described in the Purchase Order. Notwithstanding the foregoing or anything to the contrary herein, any limitation of Vendor's liability contained herein or in a Purchase Order shall not apply to: (i) claims of bodily injury; (ii) violation of intellectual property rights including but not limited to patent, trademark, or copyright infringement; (iii) indemnification requirements under the Agreement, except as allowed by subparagraph (B) below; and (iv) violation of State or Federal law including but not limited to disclosures of confidential information and any penalty of any kind lawfully assessed as a result of such violation.
- Vendor's liability for indemnification requirements under Section 10.1.1(A)(i) and Section 10.1.1(A)(iii) of the DBITS Agreement shall be limited to (i) $1 million or (ii) two-times (2x) the total value of the Purchase Order, whichever is greater. Such value includes all amounts paid and amounts to be paid over the life of the Purchase Order to Vendor by such Customer as described in the Purchase Order.
- In no event shall either party, its subsidiaries, subcontractors, or their respective personnel be liable to the other for punitive, special, or consequential damages, even if it is advised of the possibility of such damages.

DELOITTE CONSULTING LLP

_____
Uday Katira, Managing Director
Deloitte Consulting LLP

 06/17/2022
_____
Date

**CENTRAL TEXAS REGIONAL
MOBILITY AUTHORITY**

_____
James Bass
Executive Director

_____
Date

Statement of Work

**Tolling Operations Management Solution (TOMS)
Operations and Maintenance**

June 9, 2022

Table of Contents

1.   Statement of Work Purpose and Overview

The Tolling Operations Management Solution ("TOMS") is an aggregate of multiple integrated solutions that support the CTRMA transaction to cash lifecycle. TOMS fully or partially automates business processes across a number of operational domains including Transaction Management, Product Management, Payment Path Management, Discount Management, Billing Management, Data Exchange Management, and Reporting & Analytics Management.

The purpose of this Statement of Work ("SOW") is to define a suite of services necessary to support and maintain the successful daily availability, capacity, and functionality of the integrated TOMS architecture. This SOW is intended to serve as a basis of understanding between CTRMA and a 3rd party service provider ("Vendor") of the services and their respective performance levels ("SLAs").

The Operations & Maintenance Services areas are defined as follows:

- TOMS Application Support & Maintenance
- TOMS Database Maintenance
- TOMS Data Exchange Maintenance
- TOMS Reporting & Analytics Maintenance
- TOMS Support & Triage Management

1.1.   General Assumptions

1.1.1.   Support, as referenced in this SOW, does not include Call Center Services.

1.1.2.   Vendor is only responsible for operating systems that are managed by Vendor (see Appendix A).

1.1.3.   Vendor technical support for regulatory or compliance audits is limited to providing access to TOMS application, data, and reporting environments which may include standing up staging environments and loading instances of current or archived TOMS application, TOMS data schemas, TOMS reporting architecture, and/or historical transaction data

1.1.4.   Virus protection is limited to the specific TOMS components referenced in this SOW. Vendor is not responsible for end-user system virus protection

1.1.5.   Any downtime during maintenance window or outages due to infrastructure will not be count towards availability SLA metrics

2.   TOMS Application Support & Maintenance

Vendor will maintain and operate the TOMS application, user interfaces, code, components, and operating systems managed by Vendor including deployment and maintenance of dependent elements of the TOMS applications and related components. This service does not include the TOMS data architecture or TOMS data exchanges which are covered elsewhere within this agreement.

2.1.   Basic Services

2.1.1.   Manage TOMS application availability and performance, per SLAs
2.1.2.   Assist in issue triage as a representative of the TOMS application, user interfaces, code, components, and operating systems managed by Vendor (see appendix)
2.1.3.   Manage and track application inventory including code, UI/UX components, and other dependent TOMS application elements
2.1.4.   Install, maintain, monitor, and provide for the ongoing operation of production, development, and test TOMS application instances
2.1.5.   Manage break/fix services for TOMS application production, development, and test instances
2.1.6.   Maintain, create, and delete TOMS application user roles that depend on CTRMA IT security processes and tools
2.1.7.   Administrate TOMS application backup and recovery services
2.1.8.   Refresh TOMS application, user interfaces, code, components, and operating system versions managed by Vendor (see appendix) as required to stay current
2.1.9.   Support the development, maintenance, and audit of disaster recovery procedures for TOMS application, user interfaces, code, components, and operating systems managed by Vendor (see appendix)
2.1.10. Provide technical support for regulatory and compliance audits related to the TOMS application
2.1.11. Manage and maintain virus protection for the TOMS application, user interfaces, code, components, and operating systems managed by Vendor (see appendix) (excluding physical infrastructure)

2.2.   Premium Service

2.2.1.   Implement DevOps/DevSecOps that automates build, deploy and release activities
2.2.2.   Refactoring/re-platform of TOMS application user interface, code and components as required
2.2.3.   Augment specialized Security resources to support regulatory and compliance reporting
2.2.4.   Monitor and support vulnerability/DDoS activity protection for TOMS application environment

2.3.   Service Not Offered

2.3.1.   None listed

2.4.   Performance Level

Service Component	Scope	Service Measurement
TOMS Application Availability	TOMS Application Code TOMS Application User Interfaces (UIs) TOMS Application Integration with TOMS Data	Available 24x7x365, >=99% of available time Maximum outage: 7 hours per month Average outage: 30 minutes Source: Host monitoring systems and Service Center reports
TOMS Application Backup	TOMS Application Code TOMS Application User Interfaces (UIs) TOMS Application Integration with TOMS Data	Daily, weekly, monthly, quarterly, and annual backups Recovery available 24x7x365, >=99% of available time Time to recover < 24 hours Scheduled recovery audits

2.5.   Required Capabilities and Estimated Hours:

Required Capabilities	Estimated Monthly Hours	Estimated Yearly Hours
Angular, .Net Core, GCP AppEngine, Tester	110	1320

3.   TOMS Database Support & Maintenance

Vendor will maintain and operate the TOMS data architecture, data storage, and database operating systems managed by Vendor including deployment and maintenance of dependent elements of the TOMS data architecture. This service does not include the TOMS application or TOMS data exchanges which are covered elsewhere within this agreement.

3.1.   Basic Services

3.1.1.   Provide TOMS database maintenance and administration

3.1.2.   Manage TOMS data storage availability, capacity, and performance, per SLAs

3.1.3.   Assist in issue triage as a representative of the TOMS data architecture, data storage, and database operating systems

3.1.4.   Manage and track TOMS data storage inventory including architecture, data schemas, data catalogs, and other dependent TOMS data items

3.1.5.   Install, maintain, monitor, and provide for the ongoing operation of production, development, and test TOMS database instances

3.1.6.   Manage break/fix services for TOMS database production, development, and test instances

3.1.7.   Maintain, create, and delete TOMS database user roles that depend on CTRMA IT security processes and tools

3.1.8.   Administrate TOMS database and TOMS data backup and recovery services

3.1.9. Refresh TOMS data architecture, data storage, and database operating systems version managed by Vendor (see appendix) as required to stay current

3.1.10. Support development, maintenance, and audit of disaster recovery procedures for TOMS data architecture, data storage, and database operating systems

3.1.11. Provide technical support for regulatory and compliance audits related to the TOMS database and TOMS data

3.1.12. Manage and maintain virus protection for the TOMS data architecture, data storage, and database operating systems (excluding physical infrastructure)

3.2.   Premium Service

3.2.1. Augment specialized Security resources to support regulatory and compliance reporting

3.2.2. Monitor and support vulnerability/DDoS activity protection for TOMS application and database environment

3.3.   Service Not Offered

3.3.1. None listed

3.4.   Performance Level

Service Component	Scope	Service Measurement
TOMS Database Availability	TOMS Database Tables, Relationships, and Schema TOMS Database Code TOMS Data	Available 24x7x365, >=99% of available time Maximum outage: 7 hours per month Average outage: 30 minutes Source: Host monitoring systems and Service Center reports
TOMS Application Backup	TOMS Database Tables, Relationships, and Schema TOMS Database Code TOMS Data	Daily, weekly, monthly, quarterly, and annual backups Recovery available 24x7x365, >=99% of available time Time to recover < 24 hours Scheduled recovery audits

3.5.   Required Capabilities and Estimated Hours:

Required Capabilities	Estimated Monthly Hours	Estimated Yearly Hours
DBA - PostgreSQL, and BigQuery, Tester	48	576

4.   TOMS Data Exchange Maintenance

Vendor will maintain and operate the TOMS data exchanges (DEXs), exchange code, and 3rd party integration points to ensure expected data throughput meets or exceeds stated SLAs. This service does not include the TOMS application or TOMS database which are covered elsewhere within this agreement.

4.1.   Basic Services

4.1.1.   Provide TOMS DEX maintenance and administration

4.1.2.   Manage TOMS DEX availability, capacity, and performance, per SLAs

4.1.3.   Manage and track TOMS DEX inventory including architecture, DEX code, and other dependent TOMS DEX items.

4.1.4.   Install, maintain, monitor, and provide for the ongoing operation of production, development, and test TOMS DEX instances

4.1.5.   Manage break/fix services for TOMS DEX production, development, and test instances.

4.1.6.   Maintain, create, and delete TOMS DEX user roles that depend on CTRMA IT security processes and tools

4.1.7.   Administrate TOMS DEX backup and recovery services

4.1.8.   Refresh TOMS DEX architecture, exchange code, 3rd party integration points and operating systems versions managed by Vendor (see appendix) as required to stay current

4.1.9.   Support development, maintenance, and audit of disaster recovery procedures for TOMS DEX instances, DEX code, and 3rd party DEX integration points

4.1.10. Manage and maintain virus protection for the TOMS DEX instances, DEX code, and 3rd party DEX integration points (excluding physical infrastructure).

4.1.11. Assist in issue triage as a representative of the TOMS DEX instances, DEX code, and 3rd party DEX integration points.

4.1.12. Provide technical support for regulatory and compliance audits related to the TOMS DEX instances, DEX code, and 3rd party DEX integration points.

4.2.   Premium Service

4.2.1.   Refactoring/re-platform of TOMS data exchange, code and components

4.2.2.   Augment specialized Security resources to support regulatory and compliance reporting

4.2.3.   Monitor and support vulnerability/DDoS activity protection for TOMS application environment

4.3.   Service Not Offered

4.3.1.   None listed

4.4.   Performance Level

Service Component	Scope	Service Measurement
TOMS Data Exchange Availability	TOMS Data Exchange Architecture TOMS Data Exchange Code TOMS Data Exchange Integrations	Available 24x7x365, >=99% of available time Maximum outage: 7 hours per month Average outage: 30 minutes Source: Host monitoring systems and Service Center reports
TOMS Data Exchange Backup	TOMS Data Exchange Architecture TOMS Data Exchange Code TOMS Data Exchange Integrations	Daily, weekly, monthly, quarterly, and annual backups Recovery available 24x7x365, >=99% of available time Time to recover < 24 hours Scheduled recovery audits

4.5.   Required Capabilities and Estimated Hours:

Required Capabilities	Estimated Monthly Hours	Estimated Yearly Hours
Python, Data Fusion, Cloud Run, Cloud Functions, Apigee, Tester	230	2760

5.   TOMS Reporting & Analytics Maintenance

Vendor will maintain and operate the TOMS Reporting & Analytics architecture including maintenance of dependent elements of the reporting cache databases, master record integrations, data use governance compliance, reporting data and related components. This service does not include the TOMS application, TOMS data architecture or TOMS data exchanges which are covered elsewhere within this agreement.

5.1.   Basic Services

5.1.1.   Manage TOMS reporting & analytics environment availability and performance, per SLAs

5.1.2.   Assist in issue triage as a representative of the TOMS reporting & analytics architecture, data cache, reporting data, and master record integrations

5.1.3.   Manage and track reporting cache inventory including schemas, databases, master record integrations, and other dependent TOMS reporting & analytics elements

5.1.4.   Install, maintain, monitor, and provide for the ongoing operation of production, development, and test TOMS reporting & analytics instances

5.1.5.   Manage break/fix services for TOMS reporting & analytics production, development, and test instances.

5.1.6.   Maintain, create, and delete TOMS reporting & analytics user roles that depend on CTRMA IT security processes and tools

5.1.7.   Administrate TOMS reporting & analytics backup and recovery services

5.1.8.   Refresh TOMS reporting & analytics code, components, and operating systems versions managed by Vendor (see appendix) as required to stay current

5.1.9.   Support the development, maintenance, and audit of disaster recovery procedures for TOMS reporting & analytics code, components, and operating systems managed by Vendor (see appendix)

5.1.10. Provide technical support for regulatory and compliance audits related to the TOMS reporting & analytics architecture, data cache, reporting data, and master record integrations

5.1.11. Manage and maintain virus protection for the TOMS reporting & analytics code, components, and operating systems managed by Vendor (see appendix) (excluding physical infrastructure)

5.2.   Premium Service

5.2.1.   Refactoring/re-platform of TOMS application user interface, code, and components

5.2.2.   Augment specialized Security resources to support regulatory and compliance reporting

5.2.3.   Monitor and support vulnerability/DDoS activity protection for reporting and analytics environment

5.3.   Service Not Offered

5.3.1.   None listed

5.4.   Performance Level

Service Component	Scope	Service Measurement
TOMS Reporting & Analytics Availability	TOMS Reporting Cache Tables, Relationships, and Schema TOMS Reporting Cache Code TOMS Reporting Cache Reports	Available 24x7x365, >=99% of available time Maximum outage: 7 hours per month Average outage: 30 minutes Source: Host monitoring systems and Service Center reports
TOMS Reporting & Analytics Backup	TOMS Reporting Cache Tables, Relationships, and Schema TOMS Reporting Cache Code TOMS Reporting Cache Reports TOMS Reporting Cache Data (TBD)	Daily, weekly, monthly, quarterly, and annual backups Recovery available 24x7x365, >=99% of available time Time to recover < 24 hours Scheduled recovery audits

5.5.   Required Capabilities and Estimated Hours:

Required Capabilities	Estimated Monthly Hours	Estimated Yearly Hours
BI/SQL Development - PostgreSQL/BigQuery, Looker, Tester	65	780

6.   TOMS Support & Triage Management

Vendor will provide first and second tier support for the TOMS application, database architecture, data exchange architecture, reporting & analytics architecture, and all dependent elements. This service covers all break-fix issues for TOMS where SLAs are affected. Typical delivery of these services involves the problem diagnosis, resolution determination and implementation of the solution covering the TOMS application, TOMS data architecture, TOMS data exchange architecture, TOMS reporting & analytics architecture, and all TOMS-dependent elements.

6.1.   Basic Services

6.1.1.   Perform continuous monitoring of all critical TOMS architecture elements that drive availability, capacity, and throughput

6.1.2.   Serve as a first point of contact and primary stakeholder for issues identified within the TOMS application, TOMS database, TOMS data exchange, and TOMS reporting & analytics architectures

6.1.3.   Participate in service request logging, categorization, escalation, and closure of issues in the CTRMA IT incident management system

6.1.4.   Conduct triage and analysis for issues dependent upon, or directly impacting the TOMS application, TOMS database, TOMS data exchange, and TOMS reporting & analytics architectures

6.1.5.   Identify, communicate, and resolve issues within the TOMS application, TOMS database, TOMS data exchange, and TOMS reporting & analytics architectures, per SLAs

6.1.6.   Provide notification of problems and service outages to appropriate CTRMA stakeholders, per SLAs

6.1.7.   Provide and maintain issue analysis and resolution documentation for issues identified within the TOMS application, TOMS database, TOMS data exchange, and TOMS reporting & analytics architectures

6.1.8.   Administrate TOMS application, TOMS database, TOMS data exchange, TOMS reporting & analytics, and TOMS data backups using CTRMA-defined backup schedule, tools, and approaches

6.1.9.   Assist CTRMA with TOMS application, TOMS database, TOMS data exchange, TOMS reporting & analytics, and TOMS data recovery from available backups

6.2.   Premium Service

6.2.1.   None Listed

6.3.   Service Not Offered

6.3.1.   None listed

6.4.   Performance Level

Reporting Component	Scope
Weekly Standup Meeting	Weekly meeting at a mutually agreeable time with documentation and topics to be determined. Suggested topics include: • recap accomplishments and incidences from previous week • plans for the coming week
Monthly Report	Monthly report and meeting at a mutually agreeable time with documentation and topics to be determined. Suggested topics include: • SLA Reporting by Area • Availability, Capacity, Throughput Measures • Count of incidents reported • Count and duration of outages • Estimated hours consumed • Past and Planned Maintenance Outages
Quarterly Performance Retrospective	Quarterly retrospective meeting at a mutually agreeable time with documentation and topics to be determined. Suggested topics include: • Performance to Date •

6.5.   Required Capabilities and Estimated Hours

Required Capabilities	Estimated Monthly Hours	Estimated Yearly Hours
Support Manager/Tolling SME	90	1080

7.   Tolling Operations Support Staff Augmentation

Vendor will provide one or more Tolling Operations Support Staff to assist with the facilitation of the end-to-end business processes managed within the TOMS.

This role will manage and control all automated transaction pricing, discounting, and billing workflow activities and address issues that occur within the lifecycle. This includes the monitoring and support of all inbound and outbound data exchanges between the CTRMA cloud, the Central US Interoperability Hub (CUSIOP), Pail by Mail vendor (PBM), Department of Motor Vehicles (DMV), Public Reporting solutions, and other data and information exchanges with 3rd-party partners or clients.

7.1.   Staffing Process

Vendor will provide qualified candidates for CTRMA consideration. Qualified candidates will be interviewed by CTRMA IT leadership and the CTRMA TOMS Support Lead. Accepted candidates will be required to complete training on the TOMS system and the related CTRMA end-to-end business processes.

Candidates will report directly to CTRMA and will be managed by the CTRMA Transaction Operations Support Lead.

7.2.   Job Responsibilities

Enhancements that CTRMA determines will follow a waterfall approach will consist of 5 formal phases: Requirements, Design, Development, Testing, and Deployment.

- Transaction Processing Operations Support
    - Transaction Processing Workflow
        - Assigning holds to transactions
        - Assigning "Do Not Process" to transactions
    - Product Management Workflow
    - Discount Management Workflow
        - Veterans Discounts
        - Exempt Vehicle Discounts
    - Billing Management Workflow
    - Product Pricing Management Workflow
    - User Role Management
        - Adding / editing / removing access
        - Password Management
    - Issue Management & Tracking
- Data Exchange Operations Support
    - Central US Interoperability Hub (CUSIOP)
        - File management
        - Processing Stop / Start intervention
        - Reconciliation
    - Pay by Mail Vendor (PBM)

- File management
- Processing Stop / Start intervention
- Reconciliation
  - o Roadside Vendor
    - Image processing monitoring
    - File management
    - Processing Stop / Start intervention
    - Reconciliation
  - o Department of Motor Vehicles (DMV)
    - File Management
    - As needed coordination with DMV for issue management (typically minimal)
  - o Public Reporting
    - Administrating access to Public Reporting Cache
    - API Monitoring
  - o Coordination with partner agencies
    - Support of enhancements changes / defects related to CUSIOP Hub, PBM, DMV, RMA, and Roadside processing
    - Troubleshooting transaction processing issues
    - Stop / start processing
- TOMS Performance Monitoring
  - o KPI / SLA verification
  - o Trend analysis / identifying processing anomalies
  - o Coordination with infrastructure group
  - o Coordination with application / database support group
- Reporting & Analytics Support
  - o Troubleshooting system issues (ad-hoc queries)
  - o Static reports
    - Operations
    - Revenue
    - System performance / throughput
    - Traffic analysis / trends
  - o Researching customer issues
    - Performing adjustments / dismissals
  - o Public Information Requests
    - Large data extracts / queries
  - o Reconciliation between systems (CUSIOP, Roadside, DMV, and PBM to the Host)
    - Transactions
    - Revenue
  - o Ad-hoc queries / data analysis
    - Business analysis / trends / reports
    - Cost analysis
    - Traffic and revenue data (e.g., large data extracts for T&R consultants)
- Other Responsibilities

- o Communication
    - ▪ Information and Issue notification and escalation
- o Data Governance
    - ▪ Ensuring Policies and Procedures adherence
- o Compliance
    - ▪ SOC II Audit Support
- o Training & Knowledge Management Support
    - ▪ For new TOMS users (expect it to be minimal for CTRMA staff)

7.3.   Education & Experience

Candidates provided by the Vendor must meet the following skills and experience criteria:

- Bachelor's degree (Business Management, Information Systems or equivalent)
- Previous experience in business analysis, transaction processing, workflow management, and/or Tolling
- Familiarity with Google Cloud services, Looker, Postgres DB, and/or Python preferred, but not required
- Strong collaboration and communication skills
- Demonstrated analytical and problem-solving skill

APPENDIX A

Supporting References

Figure A-1: Targeted Business Domains & Capabilities for TOMS
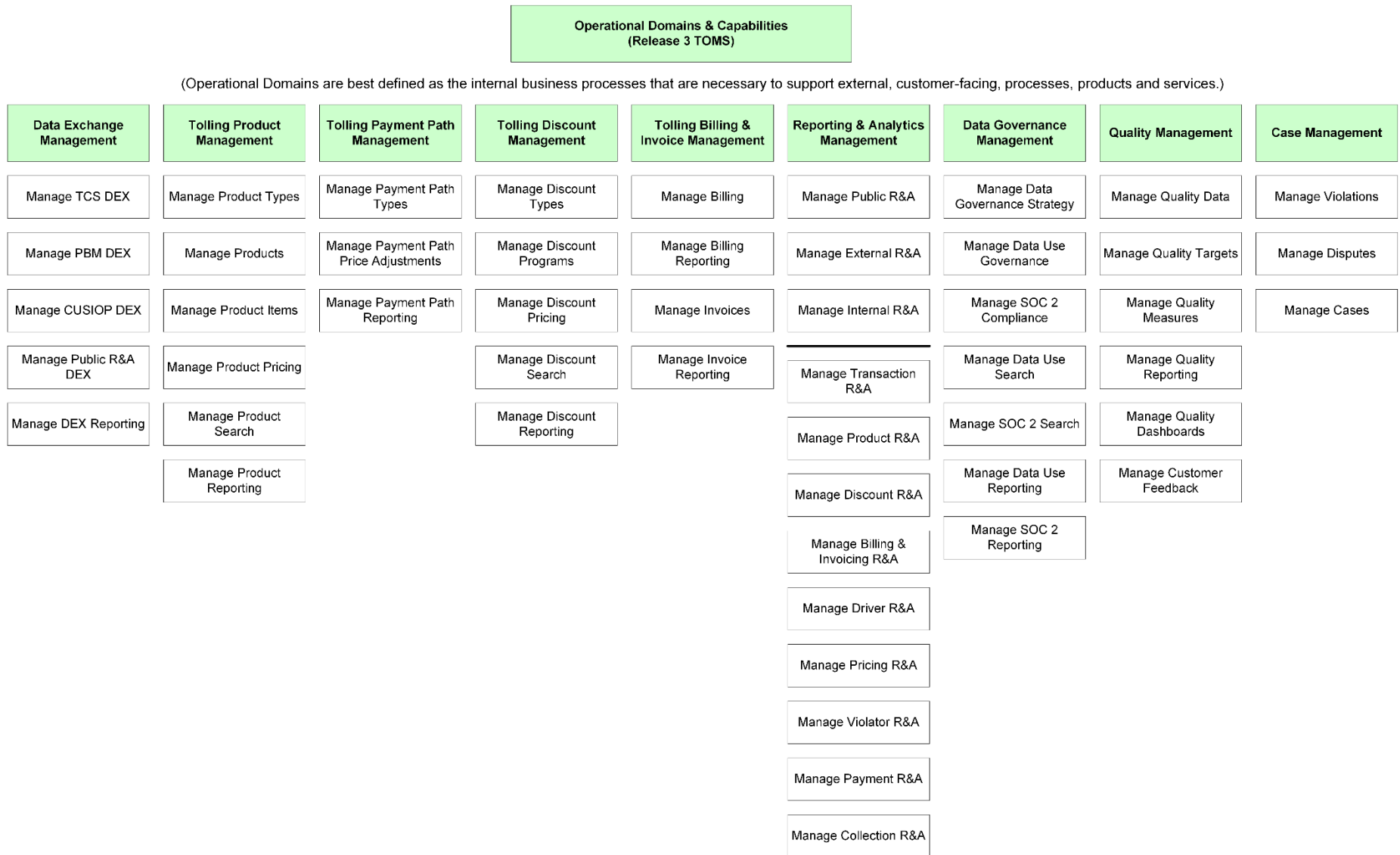
Figure A-2: Example Sprint Schedule (3-week sprint cycle) and Features-based Kanban Chart
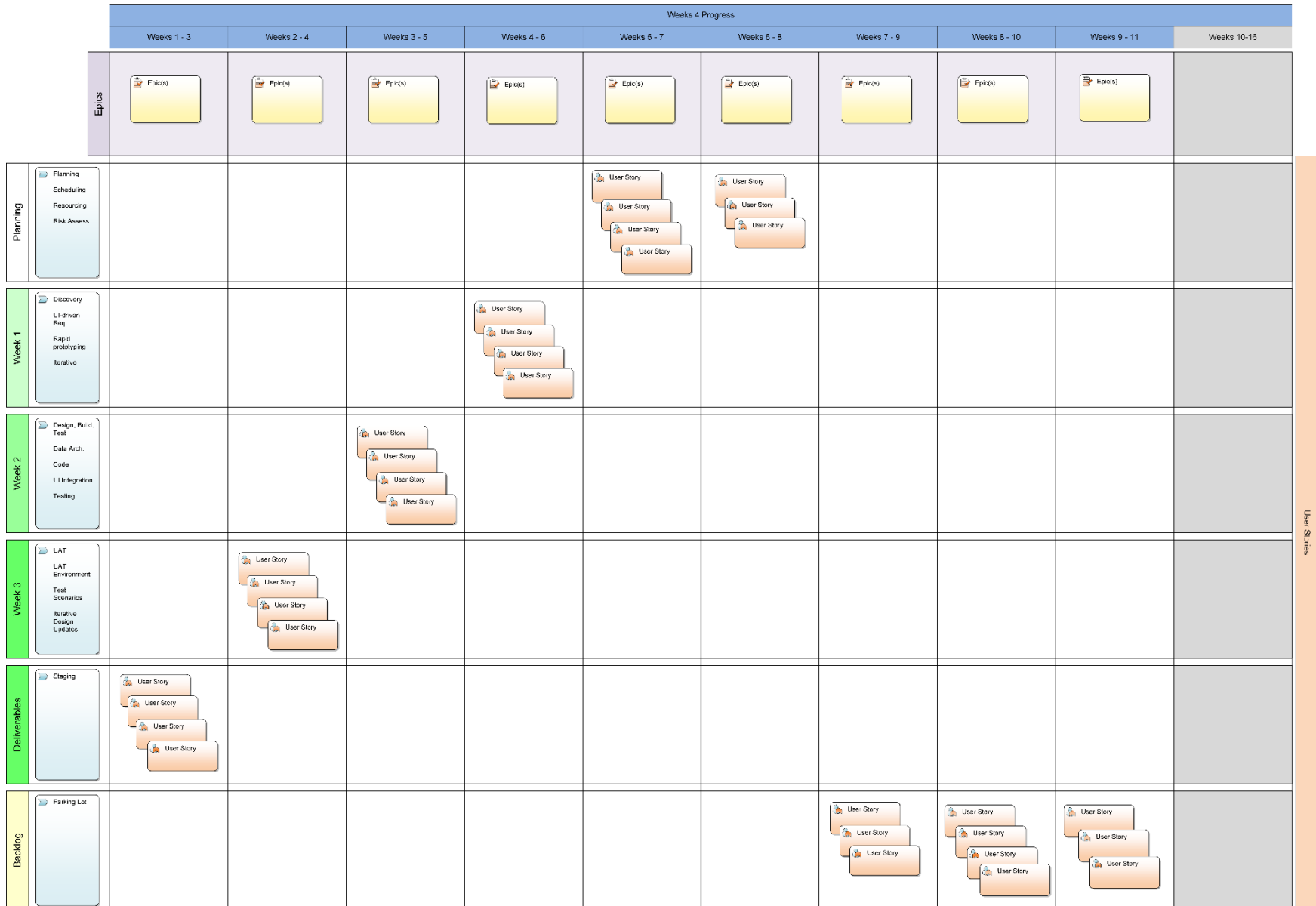
Figure A-3: Example: Daily Stand-up Kanban Chart

CENTRAL TEXAS REGIONAL MOBILITY AUTHORITY

Discuss and consider approving
Amendment No. 2 to the Kapsch Restated
Maintenance Agreement for the
incorporation of updated key
performance indicators and clarification
of maintenance pricing for Intelligent
Transportation System services

Strategic Plan Relevance:	Explore and Invest in Transformative Technology and Adopt Industry Best Practices; Deliver Multi-faceted Mobility Solutions; Invest in Effort that Extends Beyond Roadways
Department:	Operations
Contact:	Tracie Brown, Director of Operations Greg Mack, Assistant Director of IT & Toll Systems
Associated Costs:	Not Applicable
Funding Source:	FY23 Operating Budget
Action Requested:	Consider and act on a draft resolution

Background: Kapsch TrafficCom USA, Inc. serves as the Mobility Authority's system integrator. In this role, Kapsch is tasked with installing and maintaining the Mobility Authority's toll system equipment hardware, software and intelligent traffic systems (ITS). Kapsch also provides license plate image review and transcription services necessary to facilitate the billing of the Authority's Pay By Mail toll transactions as well as traffic management operations support. This action is related to Kapsch's maintenance agreement for the Authority's existing toll system which remains Kapsch's responsibility until transitioned to a new provider.

Previous Actions: The Central Texas Regional Mobility Authority entered into a contract with Caseta Technologies, Inc. April 27, 2005, for the design, procurement, and installation of a toll collection system on the Authority's turnpike system. Kapsch TrafficCom USA, Inc. is the successor in interest to the contract with Caseta Technologies, Inc. In November 2019 the Mobility Authority's Board approved a Restated Maintenance Agreement with Kapsch TrafficCom or enhanced toll system maintenance services for the roadside lane equipment, project host system, intelligent transportation systems (ITS), wrong-way detection and

communication infrastructure installed by Kapsch TrafficCom USA for all CTRMA toll facilities.

Key performance indicators (KPIs) were incorporated into the Kapsch Restated Maintenance Agreement to ensure consistent maintenance operations performance and protect the Authority in the event of lost revenue. Damages were prescribed for instances where the KPI goals aren't met and deducted from the monthly maintenance invoice or paid directly to the Authority per the restated agreement. In November 2020 the Board approved an amendment to the Restated Maintenance Agreement that altered the hours of the traffic & incident management operation staff.

The Authority's Board approved a contract with Electronic Transaction Consultants (ETC) in December 2021 to install new toll systems to support the 183N Express Lanes and 183A Phase III projects and replace toll systems on existing Authority roadways. In conjunction with this effort, the Mobility Authority is finalizing development of its Data Platform System (DPS) which will become the system of record and the integration point for the Kapsch and ETC tolling systems. These two projects will alter Kapsch's role in processing the Authority's toll transactions, requiring an amendment to the Kapsch Restated Maintenance Agreement.

Action Requested: Amendment No. 2 to the Kapsch Restated Maintenance Agreement acknowledges the change in transaction processing dynamics described above. A high-level summary of the changes begins on page 3. Additional changes have been proposed regarding inventory reports submission, system availability and response time per maintenance event category. The amendment maintains the Board's desire to protect its sizable toll technology investment, ensure reliable vendor performance and provide revenue assurance in the event of a loss.

There is no increase in costs related to this item; however, the amendment did allow the opportunity to update the pricing schedule to reflect the 2022 CPI increase. It also afforded the ability to further separate costs related to toll system and ITS maintenance services to ease transition of these services to other providers in the future.

Financing: FY23 Operating Budget (ETC Maintenance Contract)

Staff Recommendation: Staff recommends approval of Amendment No. 2 to the Kapsch Restated Maintenance Agreement.

Backup provided: Draft Resolution
                          Amendment Change Summary

**GENERAL MEETING OF THE BOARD OF DIRECTORS
OF THE
CENTRAL TEXAS REGIONAL MOBILITY AUTHORITY**

RESOLUTION NO. 22-0XX

**APPROVING AMENDMENT NO. 2 TO THE FIRST MENDED AND RESTATED
MAINTENACE SERVICES CONTRACT WITH KAPSCH TRAFFICCOM USA, INC.**

WHEREAS, by Resolution No. 19-072 dated November 20, 2019, the Central Texas Regional Mobility Authority (Mobility Authority) approved an Amended and Restated Maintenance Services Contract (Maintenance Services Contract) with Kapsch TrafficCom USA, Inc. (Kapsch); and

WHEREAS, by Resolution No. 20-077 dated November 18, 2020, the Mobility Authority approved Amendment No. 1 to the Maintenance Services Contract with Kapsch to modify the hours of Kapsch staff present at the Mobility Authority's Traffic and Incident Management Center; and

WHEREAS, by Resolution No. 21-075 dated December 15, 2021, Mobility Authority approved a contract with Electronic Transaction Consultants, LLC (ETC) to provide electronic toll collection integration and maintenance services, including the installation of new toll systems to support the 183 North Mobility Project and the 183A Phase III Project and replace toll systems on existing Mobility Authority roadways; and

WHEREAS, the development of the Mobility Authority's Data Platform System (DPS) is nearing completion serving as the system of record and the integration point for the Kapsch and ETC tolling systems; and

WHEREAS, ETC's electronic toll collection integration and maintenance services and the completion of the DPS will collectively impact Kapsch's role in processing the Mobility Authority's toll transactions and key performance indicators (KPIs) which were incorporated into the Kapsch Restated Maintenance Agreement; and

WHEREAS, the Executive Director has negotiated proposed Amendment No. 2 to the to the Maintenance Services Contract to revise certain KPIs and to implement changes regarding inventory reports submission, system availability and response time per maintenance event category which is attached hereto as Exhibit A.

NOW THEREFORE BE IT RESOLVED that the Board of Directors hereby approves Amendment No. 2 to the Amended and Restated Maintenance Services Contract with Kapsch TrafficCom USA, Inc. revising certain key performance indicators and to implement changes regarding inventory

reports submission, system availability and response time per maintenance event category which is attached hereto as Exhibit A.

Adopted by the Board of Directors of the Central Texas Regional Mobility Authority on the 29th day of June 2022.

Submitted and reviewed by: Approved:

_____   _____
James M. Bass   Robert W. Jenkins, Jr.
Executive Director   Chairman, Board of Directors

<u>Exhibit A</u>

Summary of Changes included in
Kapsch Restated Maintenance Agreement Amendment No. 2

KPI	Current Language	Proposed Language
#4 – License Plate Image Capture (LPIC)	One front human readable license plate image or one rear human readable license plate image captured and associated to correct vehicle for **99.50% of all detected vehicles**	One front human readable license plate image or one rear human readable license plate image captured and associated to correct vehicle for **99.0% of all detected vehicles**
	$200 per gantry location, per each 0.1% below threshold	**Estimated revenue loss, per gantry location, for performance below threshold**
#5 – Image Review	Audits **performed by CTRMA** or its representative	Quarterly audits **performed by Kapsch**
		Defines transaction count and confidence threshold mins
#6 – Trip	$200 **per gantry location**, per each 0.1% below threshold	$200 **per roadway direction**, per each 0.1% below threshold
#7 - Trip Processing	**99.99%** of all trips shall be transmitted **to the CTRMA primary host system** within **four (4) calendar** days of the exit transaction of the trip	**100% of all trips** shall be transmitted **to the CTRMA Data Platform System (DPS)** within **five (5) calendar days** of the exit transaction of the trip
	$200 per gantry location, per each 0.1% below threshold	**Actual revenue above $5,000 and any direct damages associated with the loss for transactions deemed lost or uncollectable**
		10% of actual revenue AND any direct damages associated with the delay for transactions processed above 5 days but within 30 days
#8 – Microwave Vehicle Detection	**Monthly** [testing frequency] with minimum transaction count as determined by audit confidence as a threshold	**Annual performance audit** performed by Kapsch, with a minimum transaction count as determined by audit confidence as a threshold.

KPI	Current Language	Proposed Language
#9 – Non-EL Transaction Processing	Formerly labeled **Host Processing**	Label changed to **Non-EL Transaction Processing** to reflect Kapsch's new role in transaction processing workflow
	100% of all transactions be **processed within 20 days of their transaction timestamp**	100% of all **non-Express Lane** transactions **transmitted to the DPS within three (3) calendar days of the transaction date**
	Actual review above $5,000 and 50% of indirect costs incurred above $5,000 plus any direct damages	For **transactions deemed lost or uncollectable, actual revenue above $5,000 and any direct damages associated with the loss.** Transactions older than 3 days are considered ineligible for billing due to age for the purposes of this metric
		For transactions processed within 3 days but no more than 30 days that result in revenue generation, 10% of actual revenue and any direct damages associated with the delay
#10 – Image Review	99.5% of transactions requiring manual completed **within 72 hours from qualification time**	99.5% of transactions requiring manual **completed and return within 72 hours from time image review request was received**
	Max liquidated damage from **$200 per gantry location per each 0.1% below threshold**	**$200 per each 0.1% below threshold for reviews completed > 72 hours <= 10 days**
		10% of actual revenue and any associated direct damages for reviews completed > 10 days and <= 30 days that result in revenue generation
		For transactions deemed lost or uncollectable, actual revenue above $5,000 and any direct damages associated with the loss. Transactions older than 3 days are considered ineligible for billing due to age for the purposes of this metric
#13 – ETC Host Availability	Formerly labeled **Host Availability**	Label changed to **ETC Host Availability**
	N/A – KPI #9 (Host) covers the maximum liquidated damages for this section	$200 per each 0.1% below threshold

Central Texas Regional Mobility Authority - Maintenance Open Road Tolling

KPI Reporting And Management Plan

KPI-RAMP

Doc No.:   NAMCPRJ-1472315366-637

Version: 1.3

Document Control

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Reference to the status- and version administration:

Status:

Draft	the document is being processed
Released	the document has been checked and released, it can only be modified if the version number is updated.
Final	the document is complete

Versions:

1.0, 1.1, etc.	"**Released**" versions
2.0	Accepted version with the status "**Final**"
2.1, 2.2, etc.	Minor revisions, supplements to version 2.0

Reference to the data classification	
Public	No restriction
Internal	Restricted to internal and external Kapsch employees (default)
	Restricted to selected active directory and/or SharePoint groups,
Secret	Restricted to selected employees, server encryption needed

Table of Contents

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List of Tables

0   Introduction

This Key Performance Indicator (KPI) Reporting and Management Plan describes how performance indicators will be monitored, calculated, audited, and reported to support KPI Reporting and Liquidated Damage (LD) assessment.

0.1   Abbreviations

The following table contains a list of important abbreviations used within this document.

Abbreviation	Description
AVC	Automatic Vehicle Classification
AVD	Automatic Vehicle Detection
AVI	Automatic Vehicle Identification
CCTV	Closed Circuit Television
CTRMA	Central Texas Regional Mobility Authority
DB	Database
DMS	Dynamic Message Sign
DPS	Data Platform System
DVAS	Digital Video Audit System
DVR	Digital Video Recorder
ETC	Electronic Toll Collection
ICS	Image Capture Station
KPI	Key Performance Indicator
LD	Liquidated Damage
LPIC	License Plate Image Capture
MMR	Monthly Maintenance Report
MPH	Miles Per Hour
MVD	Microwave Vehicle Detection
PBM	Pay By Mail
RMA	Return Material Authorization
ROMS	Remote Operations and Maintenance System
SLA	Service Level Agreement
SNTPD	Simple Network Time Protocol Daemon

Abbreviation	Description
TB	Tag Based
TCS	Toll Collection System
TVL	Tag Validation List
VES	Violation Enforcement System
VMS	Video Monitoring System
VTMS	Variable Toll Message Sign
ZC	Zone Controller

Table 1   List of used Abbreviations

0.2   List of referenced documents

The following table contains a list of documents referenced by this document.

Ref. No.	Doc. No.	Doc. Type	Document Title
[1]	NAMCPRJ-149165766-142	PDF	12_1_FINAL_AIS_Kapsch_Restated_Maint_Agreement_KapschSigned_20191216

Table 2   List of referenced documents

0.3   Revenue Calculation Parameters

The following parameters guide the calculation of revenue;

> Actual revenue calculated using 100% of AVI and I-Toll transactions and Pay by Mail transactions at the liquidation rate
> Pay by Mail revenue value should be calculated as 10% of affected transactions calculated using the AVI rate (i-Toll transactions), and the remaining 90% is calculated using the current Pay by Mail toll rate factor (e.g. AVI toll rate *1.5)
> Liquidation rate (e.g. 0.5) to be evaluated at the beginning of each Fiscal Year based on the prior year's results and applied to the estimated Pay by Mail revenue loss amount
> For lost or uncollectable transactions, transactions older than 30 calendar days are considered ineligible for billing due to age

1   KPI #1 – Automatic Vehicle Detection (AVD)

1.1   Description

The vehicle detection subsystem shall detect 99.90% of vehicles passing through the Toll Zone once and only once under all conditions within the design specification described in the requirements, including vehicles in the shoulders and straddling the lane and shoulder. Kapsch will reconcile discrepancies from CTRMA audits. Variance may be dependent on vehicle volume.

1.2   KPI Goal

The KPI goal is 99.90%.

1.3   Maximum Liquidated Damages

Maximum liquidated damages are $200 per gantry location, per each 0.1% below threshold.

1.4   Testing Frequency

Audits by CTRMA and executed by CTRMA, shall be evenly spread over the course of 12-months (e.g. approximately 1/12th of locations audited each month), with a minimum transaction count as determined by 90% confidence and a statistically significant sample size, as shown in Table 3, to show KPI compliance.

Minimum Required Samples
3,000

Table 3   KPI#1 Minimum Required Samples

1.5   Testing Process

The current testing process is a monthly audit, where CTRMA will perform a manual review of host reports, matched against Digital Video Audit System (DVAS) footage or third-party video surveillance, to ensure all vehicles traversing the roadway are detected and have transactions created for them within the host reports.

1.6 Measurement Method

$$Measured\ Accuracy\ per\ Gantry\ Location = \left[1 - \left(\frac{Detection\ Errors}{Total\ Number\ of\ Vehicles\ at\ Audited\ Gantry}\right)\right] \times 100$$

1. System reports (e.g., Traffic Reports - Lane Image Tool Report) available for audit period.
2. Video of traffic through the gantry provides determination of vehicle presence.
3. Human review of gantry video determines detection errors and transaction count.
4. Excludes:

   a) Undetected motorcycles straddling lanes as known system deficiency.
   b) Vehicles traveling in the wrong direction.
   c) Vehicles in tow using rope, chains, or other unorthodox methods.

1.7 Example KPI Calculation

In this example scenario, assume that during the audit period, and at the audited gantry, there were 5,000 Total Number of Vehicles identified in the corresponding Traffic Report. During manual review of video footage, 37 Detection Errors were identified when comparing DVAS footage or third-party video surveillance to system reports (e.g., Traffic Reports).

> Total Number of Vehicles Through Audited Gantry = 5,000
> Detection Errors = 37

$$Measured\ Accuracy = \left[1 - \left(\frac{37}{5,000}\right)\right] \times 100 = 99.26\%$$

$$Liquidated\ Damages = \frac{(0.999 - 0.992)}{0.001} \times \$200 = \$1400$$

2 *KPI #2 – Automatic Vehicle Classification (AVC)*

2.1 Description

The AVC subsystem shall correctly classify 99.50% of all detected vehicles at speeds from 5 mph up to and including 100 mph, including vehicles straddling the lanes. Shoulders are excluded from this calculation. Kapsch will reconcile discrepancies from CTRMA audits. Variance may be dependent on vehicle volume.

2.2 KPI Goal

The KPI goal is 99.50%.

2.3 Maximum Liquidated Damages

Maximum liquidated damages are $200 per gantry location, per each 0.1% below threshold.

2.4 Testing Frequency

Audits by CTRMA and executed by CTRMA, shall be evenly spread over the course of 12-months (e.g. approximately 1/12th of locations audited each month), with a minimum transaction count as determined by 90% confidence and a statistically significant sample size, as shown in Table 4, to show KPI compliance.

Minimum Required Samples
3,000

Table 4   KPI#2 Minimum Required Samples

2.5 Testing Process

The current testing process is a monthly audit. In this audit, CTRMA will perform a manual review of host reports matched against DVAS and/or third-party video, to ensure all vehicles reported in the host are properly classified.

2.6 Measurement Method

$$Measured\ Accuracy\ per\ Gantry\ Location = \left[1 - \left(\frac{Axle\text{-}Based\ Classification\ Errors}{Total\ Number\ of\ Vehicles\ at\ Audited\ Gantry}\right)\right] \times 100$$

1. System report (Traffic Reports - Lane Image Tool Report) available for audit period.
2. Video of traffic through the gantry provides determination of vehicle classification via axle counts per vehicle.
3. Human review of gantry video determines classification errors and transaction count.
4. Excludes:

   a) Undetected motorcycles straddling lanes as known system deficiency.
   b) Vehicles traveling in the wrong direction.
   c) Vehicles in tow using rope, chains, or other unorthodox methods.
   d) Vehicles traveling in lanes not outfitted with classification hardware.
   e) Undetected vehicles (the system cannot classify a vehicle it does not detect)

2.7 Example KPI Calculation

In this example scenario, assume that during the audit period, and at the audited gantry, there were 5,000 Total Number of Vehicles identified in the corresponding Traffic Report. During manual review of video footage, 37 Axle-Based Classification Errors were identified when comparing DVAS footage or third-party video surveillance to system reports (e.g., Traffic Reports).

> Total Number of Vehicles Through Audited Gantry = 5,000
> Axle-Based Classification Errors = 37

$$Measured\ Accuracy\ = \left[1 - \left(\frac{37}{5,000}\right)\right] \times 100 = \ 99.26\%$$

$$Liquidated\ Damages\ = \frac{(0.995 - 0.992)}{0.001} \times \$200 = \ \$600$$

3 KPI #3 – Automatic Vehicle Identification (AVI)

3.1 Description

The AVI subsystem will correctly detect, read, and assign to the correct vehicle 99.90% of all properly installed transponders on all detected vehicles at speeds from 5 mph up to and including 100 mph, including vehicles in the shoulders and straddling the lanes.

3.2 KPI Goal

The KPI goal is 99.90%.

3.3 Maximum Liquidated Damages (per calendar month)

Maximum liquidated damages are $200 per gantry location, per each 0.1% below threshold.

3.4 Testing Frequency

Audits by CTRMA and executed by CTRMA, shall be evenly spread over the course of 12-months (e.g. approximately 1/12th of locations audited each month), with a minimum transaction count as determined by 90% confidence and a statistically significant sample size, as shown in Table 5, to show KPI compliance.

Minimum Required Samples
5,500

Table 5   KPI#3 Minimum Required Samples

3.5 Testing Process

For AVI Detect and Read Accuracy:

1. Kapsch provides a report that displays all vehicle transactions per gantry. From this data set, the transactions are filtered for tag reads and non-tag read vehicle transactions.
2. Another filter query removes transactions with an indicated vehicle speed between 5 MPH to 100 MPH.
3. From this data set, transactions with the same transponder are matched with other vehicle transactions that occurred on the same roadway, on the same day.
4. The accuracy is calculated by counting the number of vehicles charged as an iToll at a gantry that had a tag read on the same roadway, on the same day, as an error. This value is then divided by the total number of vehicles at that plaza on that day.
5. Kapsch provides a report that includes transactions and all images captured for each transaction occurring within a CTRMA selected time (audit period). Only AVI transactions will be used. All non-AVI transactions shall be removed.
6. Transactions are matched with other vehicle transactions that occurred on the roadway in the same audit period.

7. However, if the images from both initial transactions show different vehicles, images from a third transaction for the audited transponder are compared.

   a) If the images from this third transaction match the audited transaction, the audit will consider the audited transponder correctly correlated to the transaction.

   b) If the images from the third transaction do not match the audited transaction, the audit shall consider the audited transponder to have an AVI correlation error.

   c) If the transactions are spurious or buffered tags that are clearly correlation errors, they are counted (e.g., missed association or cross lane reads).

3.6   Measurement Method

$Measured\ Accuracy\ per\ Gantry\ Location$

$$= \left\{ 1 - \left[\frac{(Detection\ and\ Read\ Errors) + (Correrlation\ Errors)}{(Detection\ and\ Read\ Audited\ Samples) + (Correlation\ Audited\ Samples)} \right] \right\} \times 100$$

1. The Number of Detection and Read Errors and Correlations Errors is the number of vehicles with an iToll transaction that was also identified to have a separate successful tag transaction at a minimum of one other gantry on the same roadway during the same day.

2. Detection and Read Audited Samples and Correlation Audited Samples are the total number of vehicles passing through the plaza.

3. Excludes vehicles:

   a) Traveling in the wrong direction

   b) Transactions with no images

   c) Transponders with only one transaction

   d) Transactions where cannot be reliably demonstrated to be the same or a different vehicle, due to such factors as image quality or obscured plate numbers

3.7   Example KPI Calculation

In this example scenario, assume that during the audit period, and at the audited gantry, there were 5,000 Total Number of Vehicles identified in the corresponding Detailed Transaction Report. An Ad-Hoc Query flagged 187 iTolls as Missed AVI Reads and Correlations as there were corresponding tag reads at another plaza on the same day.

> Total Number of Vehicles at Audited Gantry = 5,000
> Total Number of Missed AVI Reads and Correlations = 187

$Measured\ Accuracy\ = \left[1 - \left(\frac{187}{5,000} \right) \right] \times 100 = 96.26\%$

$Liquidated\ Damages\ = \frac{(0.999 - 0.962)}{0.001} \times \$200 = \$7,400$

4   KPI #4 – License Plate Image Capture (LPIC)

4.1   Description

The LPIC subsystem will capture one front, human-readable license plate image or one rear, human-readable license plate image and associate it to the correct vehicle for 99.00% of all detected vehicles traveling at speeds from 5 mph up to and including 100 mph, including vehicles straddling the lane and shoulder.

4.2   KPI Goal

The KPI goal is 99.00%.

4.3   Maximum Liquidated Damages

Estimated revenue loss is calculated using liquidation rate, per gantry location, for performance below the threshold.

4.4   Testing Frequency

Testing will occur monthly.

4.5   Testing Process

For LPIC Capture and Association:

1.   View the Code Offs by Lane Report for the roadway and audit period that is being verified. Use the first day of the month as the start date, and the last day of the month as the end date. Repeat this process for all roadways.
2.   View each report and isolate "Camera issue at lane" code off rows for each plaza/lane.
3.   Record "Total TRX", "Total Toll", and "Total Pct" for all camera issues at the lane code off.
4.   The Image Capture accuracy will be the reflected in the report and can be identified by the formula below.

4.6   Measurement Method

$Measured\ Accuracy\ per\ Gantry = 100 - (\text{Camera Issue at Lane Code Off Total Pct})$

Exclusions include the following:

1.   Undetected motorcycles straddling lanes as a known system deficiency.
2.   Vehicles traveling in the wrong direction.
3.   Vehicles in tow using rope, chains, or other unorthodox methods.
4.   Vehicles with missing, damaged, or obstructed license plates.
5.   Vehicles with unreadable temporary license plates.
6.   Motorcycles with unreadable license plates.

7. Out of State license plates that were unidentifiable.

Note: This metric only evaluates legally mounted license plates and plates that are deemed to be unidentifiable due strictly to camera issues. These are code-offs conditions and will remain in the sample set.

Camera issues include the following:

1. Blurred image
2. Cut-off image (timing)
3. Images with no vehicles (timing)
4. Over/under exposure
5. Camera angle

4.7 Example KPI Calculation

In this example scenario, assume that during the audit period, and at the audited gantry, there were 2,000 Camera Issue at Lane Code Offs, equaling a total toll value of $2,400, and a total percentage of 1.49%, as identified in the Code Offs by Lane report. The total transactions, prior to code offs, are included in the reports calculation; thus, the listed failure rate of 1.49% can be used independently to determine KPI achievement.

> Total Count of Camera Issue at Lane Code Off transactions = 2,000
> Total Toll of Camera Issue at Lane Code Off transactions = $2,400
> Total Percentage of Camera Issue at Lane Code Off transactions = 1.49%

$$Measured\ Accuracy\ =\ 100 - 1.49\% \ =\ 98.51\%$$

$$Transactions\ Below\ Threshold\ = \frac{\left[2{,}000\ x\ \frac{(1.49 - 1.00)}{100}\right]}{\left(\frac{1.49}{100}\right)} = \ 658$$

$$Total\ Toll\ Below\ Threshold\ = \left(\frac{\$2{,}400}{2{,}000}\right) x\ 658 = \$789.60$$

$$Average\ Toll\ per\ Transaction\ = \left(\frac{\$789.60}{658}\right) = \$1.20$$

$$Pay\ by\ Mail\ Revenue\ Value\ AVI\ (iToll) = \frac{(658\ x\ 10\%)\ x\ \$1.20}{1.5}\ = \$52.64\ Pay\ by\ Mail\ Revenue\ Value$$
$$= \big((658\ x\ 90\%)\ x\ \$1.20\big)\ x\ 0.5 = \$355.32$$

$$\boldsymbol{Total\ Pay\ by\ Mail\ Revenue\ Value\ = \$52.64\ (AVI) + \$355.32\ (PBM)\ = \ \$407.96}$$

5 KPI #5 – IR

5.1 Description

For transactions rejected by the manual review process, less than 1.00% shall have incorrect code-off results.

5.2 KPI Goal

The KPI goal is <1.00%.

5.3 Maximum Liquidated Damages

Maximum liquidated damages are $200, per each 0.1% below threshold.

5.4 Testing Frequency

Audits by CTRMA, at their discretion, will be executed by CTRMA, with a minimum transaction count as determined by a statistically significant sample size, as shown in Table 6, to show KPI compliance.

Minimum Required Samples per Code Off Category
1,500

Table 6   KPI#5 Minimum Required Samples

5.5 Testing Process

The current testing process is a quarterly audit, where validation will be conducted on a randomized set of coded off transactions. This subset of transactions is manually reviewed by the Kapsch Transaction Validation Team to ensure coded off transactions are given the proper code off, and to identify any valid transactions that were erroneously coded off.

Quarterly Audit Schedule:

Quarter	Review Period	Audit Due Date
1	January 1st – March 31st	April MMR
2	April 1st – June 30th	July MMR
3	July 1st – September 30th	October MMR
4	October 1st – December 31st	January MMR

Table 7   KPI#5 Quarterly Audit Schedule

5.6 Measurement Method

$$Measured\ Accuracy = \left[1 - \left(\frac{Pursuable\ Code\ Offs + Incorrect\ Code\ Offs}{Total\ Manually\ Audited\ Coded\ Off\ Images}\right)\right] \times 100$$

1. Obtain a random sample set of manually reviewed coded off transactions.
2. Verify the image code off is not pursuable (license plate number or jurisdiction unclear)

5.7 Verify a valid code off reason was applied. Example KPI Calculation

In this example scenario, assume that during the audit period, there were 5,000 Manually Audited Coded Off Images. When reviewing the images, there were 25 code offs that were pursuable and 125 code offs that were categorized incorrectly.

> Total Number Manually Audited Coded Off Images = 5,000
> Total Number of Pursuable Coded Off Images = 25
> Total Number of Incorrectly Coded Off Images = 125

$$Measured\ Accuracy = \left[1 - \left(\frac{25 + 125}{5,000}\right)\right] \times 100 = 97.00\%$$

$$Liquidated\ Damages = \frac{(0.99 - 0.97)}{0.001} \times \$200 = \$4,000$$

6 KPI #6 – Trip

6.1 Description

99.50% of all transactions shall be correctly assembled into trips.

6.2 KPI Goal

The KPI goal is 99.50%.

6.3 Maximum Liquidated Damages

Maximum liquidated damages are $200 per roadway direction, per each 0.1% below threshold.

6.4 Testing Frequency

Testing will occur monthly.

6.5 Testing Process

Testing is performed through an Ad-Hoc Query.

The test will evaluate a "correctly assembled trip" using Trip Accuracy and Fare assignment. A vehicle's identification will be evaluated by using both Tag, if present, and LPN information.

The inspection of a vehicle's identification can identify two failure types: split trip and combined vehicle information. A split trip represents a vehicle reporting on two or more distinct trips, instead of being combined into a singular trip. A combined vehicle information failure represents two distinct vehicles included in a singular trip.

Trip building validation will be conducted by verifying that all transactions with a matching plate or tag value, between 21 minutes before trip start time, through 21 minutes after the trip end time, are all included within a singular trip. Once it is verified that the trip's vehicle did not pass another toll point prior to or after the formed trip, the trip may be considered complete.

Fare assignment will be evaluated by comparing the Toll Rate Sign Posting Report to Entry Point Tolling location. The rate that was active on the sign will be compared to entry point and assigned fare to validate accuracy.

6.6 Measurement Method

$$Measured\ Accuracy\ per\ Roadway\ Direction = \left[1 - \left(\frac{Total\ Incorrectly\ Assembled\ Trips}{Total\ Audited\ Trips}\right)\right] \times 100$$

1. The number of incorrectly assembled trips will be identified by the sum of audited trips that failed to achieve both trip accuracy and correct fare assignment.
2. Total number of trips will be the count of trips evaluated.

6.7 Example KPI Calculation

In this example scenario, assume that during the audit period, and per audited roadway direction, there were 9,000 trips evaluated. Of those evaluated, 125 trips failed either trip accuracy or correct fare assignment.

> Total Number of Incorrectly Assembled Trips = 125
> Total Number of Trips = 9,000

$$Measured\ Accuracy\ = \left[1 - \left(\frac{125}{9,000}\right)\right] \times 100 = \ 98.61\%$$

$$Liquidated\ Damages\ = \frac{(0.995 - 0.986)}{0.001} \times \$200 = \ \$1,800$$

7   KPI #7 – Trip Processing

7.1   Description

100% of all trips shall be transmitted to the CTRMA Data Platform System (DPS) within six (6) calendar days of the exit transaction of the trip.

7.2   KPI Goal

The KPI goal is 100%.

7.3   Maximum Liquidated Damages (per calendar month)

Maximum liquidated damages for lost or uncollectable transactions:

1.   Actual revenue above $5,000, AND
2.   Any direct damages associated with the loss

Maximum liquidated damages for transactions transmitted > 6 days and <= 30 days, AND the result in revenue generation:

1.   10% of actual revenue, AND
2.   Any direct damages associated with the delay

Maximum liquidated damages for transactions older than 30 calendar days:

3.   Actual revenue above $5,000, AND
4.   Any direct damages associated with the loss

Note: Actual revenue value should be calculated using 100% of AVI and i-Toll transactions, and Pay by Mail transactions at the liquidation rate (to be validated every new fiscal year).

7.4   Testing Frequency

Testing will occur monthly.

7.5   Testing Process

Testing is performed through an Ad-Hoc Query.

7.6 Measurement Method

$Measured\ Accuracy =$

$$\left\{ 1 - \left[\frac{Count\ of\ Mopac\ DB\ Trips - (Count\ of\ CTRMA\ DB\ Trips\ - Count\ of\ CTRMA\ DB\ Trips > 6\ Days\ and \leq 30\ Days)}{Count\ of\ Mopac\ DB\ Trips} \right] \right\} \times 100$$

1. Count of Mopac DB Trips will be the total count of Mopac Trips in the Mopac DB.
2. Count of CTRMA DB Trips will be the total count of Mopac Trips that are found in the CTRMA DB.
3. The >6 Days will be determined by evaluating the Mopac Trip exit timestamp as the start time, and the RTRAN transmission timestamp, to the DPS, as the stop time.

7.7 Example KPI Calculation

In this example scenario, assume that during the audit period, there were 50,000 valid Mopac Trips found in the Mopac DB. Using the same sample set, there were a total of 50,000 Mopac Trips located in the CTRMA DB. Of those 50,000 Mopac Trips, 7,500 exceeded the 6 day RTRAN transmission time limit. Of the 7,500 trips that failed the KPI, 4,000 were AVI or iTolls, and 3,500 were Pay by Mail (PBM). The 4,000 AVI transactions totaled $8,400 while the 3,500 PBM transactions totaled $12,600.

> Total Count of Mopac Trips in Mopac DB = 50,000
> Total Count of Mopac Trips in CTRMA DB = 50,000
> Total Count of Mopac Trips in CTRMA DB > 6 Days and <= 30 Days = 7,500
> Total Count of Mopac Trips in CTRMA DB <= 6 Days = (50,000 – 7,500) = 42,500
> Total Count of Mopac Trips Delayed > 6 Days and <= 30 Days = 7,500

$$Measured\ Accuracy\ = \left\{ 1 - \left[\frac{50,000 - (50,000 - 7,500)}{50,000} \right] \right\} \times 100\ =\ 85.00\%$$

Actual Revenue Value = $8,400 + ($12,600 x 0.5) = $14,700

$Liquidated\ Damages\ = \$14,700\ x\ 10\% = \$1,470$

8   KPI #8 – Microwave Vehicle Detection (MVD)

8.1   Description

The volume of MVD data provided by the Traffic Detection System will be 95.00% accurate.

8.2   KPI Goal

The KPI goal is 95.00%.

8.3   Maximum Liquidated Damages (per calendar month)

Maximum liquidated damages are $200 per MVD, per each 0.1% below threshold.

8.4   Testing Frequency

Kapsch will execute an annual performance audit.

8.5   Testing Process

The current testing process is a yearly audit of all MVDs, performed by Kapsch, that will verify MVDs through comparing volume provided by the physical device (observed via the HDSmart Utility), and the volume counted through DVAS footage or third-party video surveillance. Each MVD will be audited for a minimum of five minutes, with a minimum count of 30 vehicles. The results will be annotated on the MVD Calibration Verification Sheet (see Appendix A). Any devices that fail to meet KPIs will be re-audited the following month.

Yearly Audit Schedule:

Review Period	Audit Due Date
October 1st – October 31st	November MMR

Table 8   KPI#8 Yearly Audit Schedule

8.6 Measurement Method

$$Measured\ Accuracy\ per\ MVD = \left[1 - \left(\frac{Observed\ Traffic\ Volume - MVD\ Reported\ Traffic\ Volume}{Observed\ Traffic\ Volume}\right)\right] \times 100$$

1. Observed Traffic Volume is the total observed traffic volume passing the audited MVD.
2. MVD Reported Traffic Volume is the total traffic volume captured by the MVD, via the HDSmart Utility, at the audited MVD.
3. Exceptions:

   a) Any MVD disabled for predictive or preventative maintenance.
   b) Any MVDs in non-working conditions pending repair of a damaged component. Example KPI Calculation.
   c) Any MVD which is unavailable during the auditing period, will have an individual audit conducted within 30 days of becoming available.

In this example scenario, assume that during the audit period, and per the audited MVD, there were 5,000 vehicles observed through the recorded video feed for the audited MVD location. Using the same time period and location, there were a total of 4,500 vehicles captured by the MVD through the HDSmart Utility.

> Total Observed Traffic Volume at MVD Location = 5,000
> Total MVD Reported Traffic Volume at MVD Location = 4,500

$$Measured\ Accuracy\ = \left[1 - \left(\frac{5000 - 4500}{5000}\right)\right] \times 100\ =\ 90.00\%$$

$$Liquidated\ Damages\ = \frac{(0.950 - 0.900)}{0.001} \times \$200\ =\ \$10,000$$

9 KPI #9 – Non-EL Transaction Processing

9.1 Description

100% of all Non-EL transactions shall be transmitted to the CTRMA DPS within three (3) calendar days of the transaction date.

9.2 KPI Goal

The KPI goal is 100%.

9.3 Maximum Liquidated Damages (per calendar month)

Maximum liquidated damages for lost or uncollectable transactions:

1. Actual revenue above $5,000, AND
2. Any direct damages associated with the loss

Maximum liquidated damages for transactions transmitted > 3 days and <= 30 days, AND result in revenue generation:

1. 10% of actual revenue, AND
2. Any direct damages associated with the delay

Maximum liquidated damages for transactions older than 30 calendar days:

1. Actual revenue above $5,000, AND
2. Any direct damages associated with the loss

Note: Actual revenue value should be calculated using 100% of AVI and i-Toll transactions, and PBM transactions at the liquidation rate (to be validated every new fiscal year).

9.4 Testing Frequency

Testing will occur monthly.

9.5 Testing Process

Testing is performed through an Ad-Hoc Query

9.6 Measurement Method

$$Measured\ Accuracy = \left[1 - \left(\frac{Count\ of\ Transactions > 3\ Days\ and \le 30\ Days}{Count\ of\ Total\ Transactions\ Created}\right)\right] \times 100$$

1. The count of transactions > 3 Days and <= 30 Days will be the number of transactions initially transmitted to the DPS, in the RTRAN file, within this timeframe.
2. To determine if the 3 day time limit was achieved, the transaction timestamp (lane date) will represent the start time, and the RTRAN file transmission timestamp will represent the end time.
3. The count of total transactions will be all created transactions within the annotated periods above.

9.7 Example KPI Calculation

In this example scenario, assume that during the audit period, there were 50,000 transactions created. Using the same sample set, it was found that 10,000 transactions were transmitted to the DPS, in the initial RTRAN file, outside the 3 day time limit. Of the 10,000 transactions, 6,000 were AVI or iToll, and 4,000 were PBM. The 6,000 AVI transactions totaled $4,800 while the 4,000 PBM transactions totaled $4,800.

> Total Count of Transactions = 50,000
> Total Count of Transactions Transmitted > 3 Days and <= 30 Days = 10,000

$$Measured\ Accuracy\ = \left[1 - \left(\frac{10,000}{50,000}\right)\right] \times 100\ =\ 80.00\%$$

Actual Revenue Value = $4,800 + ($4,800 x 0.5) = $7,200

$$\mathbf{Liquidated\ Damages}\ = \$7,200\ x\ 10\% = \$720$$

10 KPI #10 – IR

10.1 Description

For transactions requiring a manual review process, 99.50% shall be completed, AND returned, within 72 hours from the time the image review request was received.

10.2 KPI Goal

The KPI goal is 99.50%.

10.3 Maximum Liquidated Damages (per calendar month)

Maximum liquidated damages for Image Reviews completed > 72 hours and <= 10 days:

1. $200 per each 0.1% below threshold.

Maximum liquidated damages for Image Reviews completed > 10 days and <= 30 days, AND result in revenue generation:

1. 10% of actual revenue, AND
2. Any direct damages associated with the delay

Maximum liquidated damages for lost or uncollectable Image Review transactions:

1. Actual revenue above $5,000, AND
2. Any direct damages associated with the loss

Maximum liquidated damages for transactions older than 30 calendar days:

1. Actual revenue above $5,000, AND
2. Any direct damages associated with the loss

Note: Actual revenue value should be calculated using 100% of AVI and i-Toll transactions, and Pay by Mail transactions at the liquidation rate (to be validated every new fiscal year).

10.4 Testing Frequency

Testing will occur monthly.

10.5 Testing Process

Testing is performed through an Ad-Hoc Query.

10.6 Measurement Method

$$Measured\ Accuracy\ =\left[1-\left(\frac{Total\ Manual\ Image\ Review\ Results\ Returned > 72\ Hours\ and\ \leq 10\ Days}{Total\ Manual\ Image\ Review\ Requests\ Received}\right)\right] x\ 100$$

1. Total manual Image Review requests received is the total amount of image review requests received from the DPS, in an IREQ file.

2. Total manual Image Review results returned > 72 hours and <= 10 days will be the number of image review results returned to the DPS, in an ITRAN, within this timeframe.

3. To determine if Image Review timeframes were achieved, the IREQ receipt timestamp will represent the start time, and the ITRAN file transmission timestamp will represent the end time.

10.7 Example KPI Calculation

In this example scenario, assume that during the audit period, there were 250,000 manual Image Review requests received in an IREQ file. Using the same sample set, there were a total of 246,000 manual Image Review results returned in an ITRAN file within the 72-hour time limit. Of the remaining 4,000 manual Image Review requests, 2,000 were completed and results returned > 72 hours and <= 10 days. The final 2,000 manual Image Review requests were completed and returned > 10 days and <= 30 days. Of the 2,000 transactions, 1,200 were AVI or iToll, and 800 were PBM. The 1,200 AVI transactions totaled $960 while the 800 PBM transactions totaled $1,450.

> Total Count of Manual Image Review Requests Received = 250,000
> Total Count of Manual Image Review Results Returned < 72 Hours = 246,000
> Total Count of Manual Image Review Results Returned > 72 Hours and <= 10 Days = 2,000
> Total Count of Manual Image Review Results Returned > 10 Days and <= 30 Days = 2,000

$$Measured\ Accuracy\ =\ \left[1-\left(\frac{2,000}{250,000}\right)\right]\times 100\ =\ 99.20\%$$

$$Liquidated\ Damages\ for\ Image\ Review\ Results\ Returned > 72\ Hours\ and\ \leq 10\ Days\ =\ \frac{(0.995-0.992)}{0.001}\times \$200\ =\ \$600$$

$$Actual\ Revenue\ Value\ for\ Image\ Review\ Results\ Returned > 10\ Days\ and\ \leq 30\ Days\ =\ \$960+(\$1,450\ x\ 0.5)\ =\ \$1,685$$

$$Liquidated\ Damages\ for\ Image\ Review\ Results\ Returned > 10\ Days\ and\ \leq 30\ Days\ =\ \$1,685\ x\ 10\%\ =\ \$168.50$$

Total Liquidated Damages for Image Review Results Returned > 72 Hours = $600 + $168.50 = $768.50

11 KPI #11 – Reports

11.1 Description

The Monthly Maintenance Report, accurately detailing system performance relative to all Project KPIs, shall be submitted to CTRMA each month. The Monthly Inventory Report, to be exported directly from the Remote Operations and Maintenance System (ROMS), accurately details the location, count, and serial numbers of all the CTRMA hardware, including retired hardware (if applicable), spares and Return Material Authorization (RMA) hardware for the previous calendar month. Kapsch is to provide complete reports, which include a cover page, table of contents, and summaries, in a format to be agreed upon by Kapsch and CTRMA.

11.2 KPI Goal

All elements described in Section 11.1 will be submitted to CTRMA by the 15th of the following month.

11.3 Maximum Liquidated Damages (per calendar month)

Kapsch cannot invoice for the monthly maintenance fee without submitting these reports.

11.4 Testing Frequency

Testing will occur monthly.

11.5 Testing Process

n/a

12   KPI #12 – ETC Availability

12.1   Description

Each ETC lane shall be available 99.50% of the time. An available lane is defined as a lane with the ability to collect revenue either through image capture or tag read and association.

12.2   KPI Goal

The KPI goal is 99.50%.

12.3   Maximum Liquidated Damages

Lost or delayed transactions as a result of ETC lane unavailability shall be included in, and calculated per, KPI #7 (Trip Processing) or KPI #9 (Non-EL Transaction Processing).

12.4   Testing Frequency

Testing will occur monthly.

12.5   Testing Process

The Toll Zone Equipment Availability KPI will be measured using the ROMS Downtime Analysis Report, as configured and agreed upon by Kapsch and CTRMA.

12.5.1   Applicability

The Toll Zone Equipment Availability KPI is applicable as follows:

MOPAC

1. Shoulder Lane Availability
    a. 1 of 2 Cameras are operational **AND**
    b. 1 of 2 SICKs are operational
2. Non-Shoulder Lane Availability
    a. 1 of 2 Cameras are operational **AND**
    b. 1 of 2 SICKs are operational **OR**
    c. Tag Reader is operational
3. All Lane Availability
    a. 1 of 2 ZC Applications are running and creating accurate vehicle transactions **AND**
    b. 1 of 2 ICS Servers is online and receiving images from cameras

All Other Roadways

1. Shoulder Lane Availability
    a. 1 of 2 Cameras are operational **AND**
    b. Idris is operational
2. Non-Shoulder Lane Availability
    a. 1 of 2 Cameras are operational **AND**
    b. Idris is operational **OR**
    c. Tag Reader is operational
3. All Lane Availability
    a. 1 of 2 ZC Applications are running and creating accurate vehicle transactions **AND**
    b. 1 of 2 ICS Servers is online and receiving images from cameras

12.6   Measurement Method

$$Measured\ Accuracy\ per\ ETC\ Lane = \left[1 - \left(\frac{Total\ Lane\ Unavailability\ Time\ Per\ Plaza}{Total\ Time\ in\ Audit\ Period}\right)\right] \times 100$$

1. Total lane unavailability time per plaza will be the cumulative downtime that meets the defined unavailability criteria listed in this KPI.
2. Total time in audit period is the total days, hours, and or minutes within the corresponding audit time frame.
3. The following excluded downtime examples will be captured within ROMS to adjust system availability calculations automatically:

    a) Inaccessibility due to hazardous conditions
    b) Downtime for scheduled maintenance
    c) External forces which cause equipment damage
    d) Inaccessibility due to CTRMA driven operational considerations, even though device has failed.

12.7 Example KPI Calculation

In this example scenario, assume that during the audit period, Lane X was unavailable, as defined in the availability criteria of this KPI, for a cumulative total of 6 hours and 35 minutes. The Total Time in Audit Period was 720 hours.

> Total Lane Unavailability = 6 hours, 35 minutes (395 min)
> Total Time in Audit Period = 720 hour (43,200 min)

$$Measured\ Accuracy\ =\ \left[1 - \left(\frac{395}{43200}\right)\right] \times 100\ =\ 99.09\%$$

12.8 Estimated Revenue Loss Measurement Method

For the purpose of quantifying lost revenue, the calculated liquidation rate, as referenced in this document, will utilize the following parameters:

1. Identify the revenue loss timeframe

   a) Determine total allowable unavailable time for audit period
   b) Determine when total allowable unavailability time has been exhausted
   c) Determine adjusted start time and end time of lost revenue event that is subject to liquidated damages

2. Identify the historical transaction volume, rate, and type of the referenced plaza/lane for the liable timeframe for the lost revenue incident.
3. Historical transaction data will be for the identical day of the week and identical time of day for the prior three weeks.
4. Historical transaction data will be evaluated to determine percentage of tag based (TB) transactions vs PBM transactions.
5. Identify current Liquidation Rate (maintained by CTRMA).

The estimated revenue loss will use the following calculation methods:

$Allowable\ Unavailable\ Time\ =\ Total\ Time\ in\ Audit\ Period - \big(0.995(Total\ Time\ in\ Audit\ Period)\big)$

$Adjusted\ Unavailable\ Time\ =\ Unavailable\ Time - Allowable\ Unavailable\ Time$

$Revenue\ Loss\ Start\ Time\ =\ Start\ Time\ of\ Unavailability + Allowable\ Unavailable\ Time$

$Revenue\ Loss\ End\ Time\ =\ Revenue\ Loss\ Start\ Time + Adjusted\ Unavailable\ Time$

$Estimated\ Revenue\ Loss =$

$\{Liquidation\ Rate\ (Avg\ PBM\ Transactions\ x\ Avg\ PBM\ Toll\ Rate)\} + (Avg\ TB\ Transactions\ x\ Avg\ TB\ Toll\ Rate)$

12.9 Example Estimated Revenue Loss Calculation

In this example scenario, assume that during the audit period, Lane X was unavailable, as defined in the availability criteria of this KPI, for a cumulative total of 6 hours and 35 minutes (395 minutes). The Total Time in Audit Period was 720 hours (43,200 minutes).

$$Allowable\ Unavailable\ Time\ =\ 43{,}200\ minutes - \big(0.995(43{,}200)\big) = 216\ minutes$$

$$Adjusted\ Unavailable\ Time\ = 395\ minutes - 216\ minutes = 175\ minutes$$

$$Revenue\ Loss\ Start\ Time\ =\ 08{:}35AM + 216\ minutes = 12{:}11PM$$

$$Revenue\ Loss\ End\ Time\ =\ 12{:}11PM + 175\ minutes = 03{:}06PM$$

$$Estimated\ Revenue\ Loss\ =\ \{0.50\ (412\ x\ \$1.85)\} + (515\ x\ \$1.25) = \$1{,}024.85$$

Note: Reference KPI #7 (Trip Processing) and KPI #9 (Non-EL Transaction Processing) for the inclusion of any liquidated damages.

13 KPI #13 – ETC Host Availability

13.1 Description

The Host Level system shall be available 99.50% of the time. An available host is defined as a fully operating host such that reports, ROMS, and transaction processing are online (with the exception of approved downtime for maintenance purposes).

13.2 KPI Goal

The KPI goal is 99.50%.

13.3 Maximum Liquidated Damages

Maximum liquidated damages are $200 per each 0.1% below threshold.

13.4 Testing Frequency

Testing will occur monthly.

13.5 Testing Process

The ETC Host Availability KPI will be measured using the ROMS Downtime Analysis Report, as configured and agreed upon by Kapsch and CTRMA.

13.5.1 Applicability

The ETC Host Availability KPI is applicable as follows:

> For the purpose of this KPI, the ETC Host includes the systems, applications, and processes listed below:

- Database
- Toll Host (Reports)
- ROMS (Engine, DB, UI)
- Application Server
- VES Server
- Host Server
- Inserters (Host, ICS, ROMS)

> Calculated unavailability will only apply when both the primary ETC Host and secondary ETC Host have failed or are unavailable.

13.6 Measurement Method

$$Measured\ Accuracy = \left[1 - \left(\frac{Total\ ETC\ Host\ Unavailability\ Time}{Total\ Time\ in\ Audit\ Period}\right)\right] \times 100$$

1. Total ETC Host unavailability time will be the cumulative downtime that meets the defined unavailability criteria listed in this KPI.
2. Total Time in Audit Period is the total days, hours, and or minutes within the corresponding audit time frame.
3. The following excluded downtime examples will be captured within ROMS to adjust system availability calculations automatically:

   a) Inaccessibility due to hazardous conditions
   b) Downtime for scheduled maintenance
   c) External forces which cause equipment damage
   d) Inaccessibility due to CTRMA driven operational considerations, even though device has failed.

13.7 Example KPI Calculation

In this example scenario, assume that during the audit period, primary and secondary ETC Hosts were both unavailable, as defined in the availability criteria of this KPI, for a cumulative total of 6 hours and 35 minutes. Total Time in Audit Period was 720 hours.

> Total Host Unavailability = 6 hours, 35 minutes (395 min)
> Total Time in Audit Period = 720 hour (43,200 min)

$$Measured\ Accuracy\ = \left[1 - \left(\frac{395}{43200}\right)\right] \times 100\ =\ 99.09\%$$

$$Liquidated\ Damages\ = \frac{(0.995 - 0.990)}{0.001} \times \$200 =\ \$1,000$$

14 KPI #14 – Express Closed-Circuit Television (CCTV) Availability

14.1 Description

Express CCTV shall be available 99.50% of the time, excluding scheduled maintenance.

14.2 KPI Goal

The KPI goal is 99.50%.

14.3 Maximum Liquidated Damages.

Maximum liquidated damages are $200 per each 0.5% below threshold.

14.4 Testing Frequency

Testing will occur monthly.

14.5 Testing Process

The Express CCTV Availability KPI will be measured using the ROMS Downtime Analysis Report, as configured and agreed upon by Kapsch and CTRMA.

14.6 Measurement Method

$$Measured\ Accuracy = \left[1 - \left(\frac{Total\ Express\ CCTV\ Unavailability\ Time}{Total\ Time\ in\ Audit\ Period}\right)\right] \times 100$$

1. Total Express CCTV Unavailability Time will be the cumulative downtime of each Express CCTV during the audit period.
2. Total Time in Audit Period is the total days, hours, and/or minutes within the corresponding audit time frame.
3. The following excluded downtime examples will be captured within ROMS to adjust system availability calculations automatically:

   a) Inaccessibility due to hazardous conditions
   b) Downtime for scheduled maintenance
   c) External forces which cause equipment damage
   d) Inaccessibility due to CTRMA driven operational considerations, even though device has failed.

14.7 Example KPI Calculation

In this example scenario, assume that during the audit period, Express CCTV #1 & #2 were unavailable for a cumulative total of 6 hours and 35 minutes. The Total Time in Audit Period was 720 hours.

> Total Express CCTV Unavailability = 6 hours, 35 minutes (395 min)
> Total Time in Audit Period = 720 hour (43,200 min)

$$Measured\ Accuracy\ = \left[1 - \left(\frac{395}{43200}\right)\right] \times 100\ =\ 99.09\%$$

$$Liquidated\ Damages\ =\ \frac{(0.995 - 0.990)}{0.005} \times \$200 =\ \$200$$

15 KPI #15 – Non-Express CCTV Availability

15.1 Description

Non-Express CCTV shall be available 95.00% of the time, excluding scheduled maintenance.

15.2 KPI Goal

The KPI goal is 95.00%.

15.3 Maximum Liquidated Damages.

Maximum liquidated damages are $200 per each 0.5% below threshold.

15.4 Testing Frequency

Testing will occur monthly.

15.5 Testing Process

The Non-Express CCTV Availability KPI will be measured using the ROMS Downtime Analysis Report, configured and agreed upon by Kapsch and CTRMA.

15.6 Measurement Method

$$Measured\ Accuracy = \left[1 - \left(\frac{Total\ Non\ Express\ CCTV\ Unavailability\ Time}{Total\ Time\ in\ Audit\ Period}\right)\right] \times 100$$

1. Total Non-Express CCTV Unavailability Time will be the cumulative downtime of each Non-Express CCTV during audit period.
2. Total Time in Audit Period is the total days, hours, and or minutes within the corresponding audit time frame.
3. The following excluded downtime examples will be captured within ROMS to adjust system availability calculations automatically:

   a) Inaccessibility due to hazardous conditions
   b) Downtime for scheduled maintenance
   c) External forces which cause equipment damage
   d) Inaccessibility due to CTRMA driven operational considerations, even though device has failed.

15.7 Example KPI Calculation

In this example scenario, assume that during the audit period, Non-Express CCTV #1 & #2 were unavailable for a cumulative total of 6 hours and 35 minutes. The Total Time in Audit Period was 720 hours.

> Total Non-Express CCTV Unavailability = 6 hours, 35 minutes (395 min)
> Total Time in Audit Period = 720 hour (43,200 min)

$$Measured\ Accuracy = \left[1 - \left(\frac{395}{43200}\right)\right] \times 100 = 99.09\%$$

$$Liquidated\ Damages = \frac{(0.950 - 0.990)}{0.005} \times \$200 = \$0$$

16 KPI #16 – Dynamic Message Sign (DMS) Availability

16.1 Description

DMS shall be available 95.00% of the time, excluding scheduled maintenance.

16.2 KPI Goal

The KPI goal is 95.00%.

16.3 Maximum Liquidated Damages.

Maximum liquidated damages are $200 per each 0.5% below threshold.

16.4 Testing Frequency

Testing will occur monthly.

16.5 Testing Process

The DMS Availability KPI will be measured using the ROMS Downtime Analysis Report, configured and agreed upon by Kapsch and CTRMA.

16.6 Measurement Method

$$Measured\ Accuracy = \left[1 - \left(\frac{Total\ DMS\ Unavailability\ Time}{Total\ Time\ in\ Audit\ Period}\right)\right] \times 100$$

1. Total DMS Unavailability Time will be the cumulative downtime of each DMS during audit period.
2. Total Time in Audit Period is the total days, hours, and or minutes within the corresponding audit time frame.
3. The following excluded downtime examples will be captured within ROMS to adjust system availability calculations automatically:

   a) Inaccessibility due to hazardous conditions
   b) Downtime for scheduled maintenance
   c) External forces which cause equipment damage
   d) Inaccessibility due to CTRMA driven operational considerations, even though device has failed.

16.7 Example KPI Calculation

In this example scenario, assume that during the audit period, DMS #1 & #2 were unavailable for a cumulative total of 6 hours and 35 minutes. The Total Time in Audit Period was 720 hours.

> Total DMS Unavailability = 6 hours, 35 minutes (395 min)
> Total Time in Audit Period = 720 hour (43,200 min)

$$Measured\ Accuracy = \left[1 - \left(\frac{395}{43200}\right)\right] \times 100 = 99.09\%$$

$$Liquidated\ Damages = \frac{(0.950 - 0.990)}{0.005} \times \$200 = \$0$$

17   KPI #17 – Express MVD Availability

17.1   Description

Express MVDs shall be available 99.50% of the time per segment, excluding scheduled maintenance.

17.2   KPI Goal

The KPI goal is 99.50%.

17.3   Maximum Liquidated Damages

Maximum liquidated damages are: $100 per each 0.5% below threshold, per segment.

17.4   Testing Frequency

Testing will occur monthly.

17.5   Testing Process

The Express MVD's Availability KPI will be measured using the ROMS Downtime Analysis Report, as configured and agreed upon by Kapsch and CTRMA.

17.6 Measurement Method

$$Measured\ Accuracy\ per\ Segment = \left[1 - \left(\frac{Total\ Express\ MVD\ Unavailability\ Time}{Total\ Time\ in\ Audit\ Period}\right)\right] \times 100$$

1. Total Express MVD Unavailability Time will be the cumulative downtime of each Express MVD, per segment, during audit period.
2. Total time in audit period is the total days, hours, and or minutes within the corresponding audit time frame.
3. The following excluded downtime examples will be captured within ROMS to adjust system availability calculations automatically:

   a) Inaccessibility due to hazardous conditions
   b) Downtime for scheduled maintenance
   c) External forces which cause equipment damage
   d) Inaccessibility due to CTRMA driven operational considerations, even though device has failed.

17.7 Example KPI Calculation

In this example scenario, assume that during the audit period, Express MVD #1 and #2, of segment #4, was unavailable for a cumulative total of 6 hours and 35 minutes. Total Time in Audit Period was 720 hours.

> Total Express MVD Unavailability = 6 hours, 35 minutes (395 min)
> Total Time in Audit Period = 720 hour (43,200 min)

$$Measured\ Accuracy = \left[1 - \left(\frac{395}{43200}\right)\right] \times 100 = 99.09\%$$

$$Liquidated\ Damages = \frac{(0.995 - 0.990)}{0.005} \times \$100 = \$100$$

18   KPI #18 – Non-Express MVD Availability

18.1   Description

Non-Express MVDs shall be available 95.00% of the time per device, excluding scheduled maintenance.

18.2   KPI Goal

The KPI goal is 95.00%.

18.3   Maximum Liquidated Damages

Maximum liquidated damages are: $100 per each 0.5% below threshold per device.

18.4   Testing Frequency

Testing will occur monthly.

18.5   Testing Process

The Non-Express MVD's Availability KPI will be measured using the ROMS Downtime Analysis Report, configured and agreed upon by Kapsch and CTRMA.

18.6   Measurement Method

$$Measured\ Accuracy\ per\ Device = \left[1 - \left(\frac{Total\ Non\ Expess\ MVD\ Unavailability\ Time}{Total\ Time\ in\ Audit\ Period}\right)\right] \times 100$$

1. Total Non-Express MVD Unavailability Time will be the cumulative downtime of each Non-Express MVD during audit period.
2. Total Time in Audit Period is the total days, hours, and or minutes within the corresponding audit time frame.
3. The following excluded downtime examples will be captured within ROMS to adjust system availability calculations automatically:

    a) Inaccessibility due to hazardous conditions
    b) Downtime for scheduled maintenance
    c) External forces which cause equipment damage
    d) Inaccessibility due to CTRMA driven operational considerations, even though device has failed.

18.7   Example KPI Calculation

In this example scenario, assume that during the audit period, Non-Express MVD #1 was unavailable for a cumulative total of 6 hours and 35 minutes. Total Time in Audit Period was 720 hours.

>   Total Non-Express MVD Unavailability = 6 hours, 35 minutes (395 min)
>   Total Time in Audit Period = 720 hour (43,200 min)

$$Measured\ Accuracy\ = \left[1 - \left(\frac{395}{43200}\right)\right] \times 100\ =\ 99.09\%$$

$$Liquidated\ Damages\ =\ \frac{(0.950 - 0.990)}{0.005} \times \$100 =\ \$0$$

19   KPI #19 – Variable Toll Message Sign (VTMS) Availability

19.1   Description

The Variable Toll Message Sign (VTMS) System will be available as outlined below, excluding scheduled maintenance. It will have an availability of 99.95%, with a 15-minute grace period for emergency maintenance.

19.2   KPI Goal

The KPI goal is 99.95%, with the exclusion of a 15-minute grace period.

19.3   Maximum Liquidated Damages

Maximum liquidated damages are actual revenue above $5,000 (calculated using liquidation rate).

19.3.1   Liquidated Damages Calculation Method

For the purpose of calculating liquidated damages of actual revenue, said revenue shall be otherwise deemed uncollectable by CTRMA. Uncollectable revenue will utilize the following calculation example:

$$Liquidated\ Damages = \ Liquidation\ Rate\ (PBM\ Expected\ Revenue) + (TB\ Expected\ Revenue)$$

Current Liquidation Rate maintained by CTRMA

19.4   Testing Frequency

Testing will occur monthly.

19.5   Testing Process

The VTMS's Availability KPI will be measured using the ROMS Downtime Analysis Report, configured and agreed upon by Kapsch and CTRMA.

19.6   Measurement Method

$$Measured\ Accuracy = \left[1 - \left(\frac{Total\ VTMS\ Unavailability\ Time - 15\ Minute\ Grace\ Period\ per\ Occurrence}{Total\ Time\ in\ Audit\ Period}\right)\right] \times 100$$

1. Total VTMS Unavailability Time will be the cumulative downtime of each VTMS during audit period.
2. Total Time in Audit Period is the total days, hours, and or minutes within the corresponding audit time frame.
3. A 15-minute grace period, per occurrence, will be deducted from the total unavailable time.
4. The following excluded downtime examples will be captured within ROMS to adjust system availability calculations automatically:

    a) Inaccessibility due to hazardous conditions
    b) Downtime for scheduled maintenance
    c) External forces which cause equipment damage
    d) Inaccessibility due to operational considerations, even though device has failed.

19.7   Example KPI Calculation

In this example scenario, assume that during the audit period, VTMS #1 was unavailable for a cumulative total of 6 hours and 35 minutes. Of the cumulative unavailable time, two hours was excluded downtime due to the sum of eight separate, 15-minute grace periods. Total time in audit period was 720 hours.

> Total VTMS Unavailability = 6 hours, 35 minutes (395 min)
> Total Grace Period Time = 2 hours (120 min)
> Adjusted Unavailability = 4 hours, 35 minutes (275 min)
> Total Time in Audit Period = 720 hour (43,200 min)

$$Measured\ Accuracy = \left[1 - \left(\frac{395 - 120}{43200}\right)\right] \times 100 = 99.36\%$$

19.8 Estimated Revenue Loss Measurement Method

For the purpose of quantifying lost revenue, the calculated liquidation rate as referenced in this document, will utilize the following parameters:

1. Identify the revenue loss timeframe

   a) Determine total allowable unavailable time for audit period
   b) Determine when total allowable unavailability time has been exhausted
   c) Determine adjusted start time and end time of lost revenue event that is subject to liquidated damages

2. Identify the historical transaction volume, rate, and type of the referenced plaza/lane for the liable timeframe for the lost revenue incident.
3. Historical transaction data will be for the identical day of the week and identical time of day, for the prior three weeks.
4. Historical transaction data will be evaluated to determine percentage of TB transactions vs PBM transactions.
5. Identify current Liquidation Rate (maintained by CTRMA).

The estimated revenue loss will use the following calculation methods:

$Allowable\ Unavailable\ Time\ =\ Total\ Time\ in\ Audit\ Period - \left(0.9995(Total\ Time\ in\ Audit\ Period)\right)$

$Adjusted\ Unavailable\ Time\ =\ Unavailable\ Time - Allowable\ Unavailable\ Time$

$Revenue\ Loss\ Start\ Time\ =\ Start\ Time\ of\ Unavailability + Allowable\ Unavailable\ Time$

$Revenue\ Loss\ End\ Time\ =\ Revenue\ Loss\ Start\ Time + Adjusted\ Unavailable\ Time$

$Estimated\ Revenue\ Loss =$
$\{Liquidation\ Rate\ (Avg\ PBM\ Transactions\ x\ Avg\ PBM\ Toll\ Rate)\} + (Avg\ TB\ Transactions\ x\ Avg\ TB\ Toll\ Rate)$

19.9 Example Estimated Revenue Loss Calculation

In this example scenario, assume that during the audit period, Lane X was unavailable, as defined in the availability criteria of this KPI, for a cumulative total of 6 hours and 35 minutes (395 minutes). The Total Time in Audit Period was 720 hours (43,200 minutes).

$Allowable\ Unavailable\ Time\ =\ 43,200\ minutes - \left(0.9995(43,200)\right) = 21\ minutes$

$Adjusted\ Unavailable\ Time\ =\ 395\ minutes - 21\ minutes = 374\ minutes$

$Revenue\ Loss\ Start\ Time\ =\ 08{:}35 AM + 21\ minutes = 08{:}56\ AM$

$Revenue\ Loss\ End\ Time\ =\ 08{:}56\ AM + 374\ minutes = 03{:}10 PM$

$Estimated\ Revenue\ Loss\ =\ \{0.50\ (412\ x\ \$1.85)\} + (515\ x\ \$1.25) = \$1,024.85$

20   KPI #20 – VTMS Accuracy

20.1   Description

The system will post and maintain the correct toll rate to the VTMS 99.90% of the time, per VTMS, under all conditions within the design specification described in the requirements.

20.2   KPI Goal

The KPI goal is 99.90%.

20.3   Maximum Liquidated Damages

Maximum liquidated damages are $200 per each 0.5% below threshold.

20.4   Testing Frequency

Testing will occur monthly.

20.5   Testing Process

Testing is performed through an Ad-Hoc Query, in addition to the ROMS Downtime Analysis Report, as configured and agreed upon by Kapsch and CTRMA.

Accuracy of the VTMS will be evaluated for the following criteria:

> Rate sent from the trip engine matches the rate displayed on VTMS
> Default rates shown on VTMS

20.6   Measurement Method

$$Measured\ Accuracy\ per\ VTMS = \left[1 - \left(\frac{Total\ Time\ of\ Incorrectly\ Displayed\ Toll\ Rate\ per\ VTMS}{Total\ Time\ in\ Audit\ Period}\right)\right] \times 100$$

1. Total Time of Incorrectly Displayed Toll Rate per VTMS will be the cumulative time that each VTMS presented an incorrect toll rate during the audit period.
2. Total Time in Audit Period is the total days, hours, and or minutes within the corresponding audit time frame.
3. The following excluded downtime examples will be captured within ROMS to adjust system availability calculations automatically:

   a) Inaccessibility due to hazardous conditions
   b) Downtime for scheduled maintenance
   c) External forces which cause equipment damage
   d) Inaccessibility due to operational considerations, even though device has failed.

20.7   Example KPI Calculation

In this example scenario, assume that during the audit period, VTMS #1 posted an inaccurate toll rate for a cumulative total of 6 hours and 35 minutes. The Total Time in Audit Period was 720 hours.

> Total Time of Incorrectly Displayed Toll Rates per VTMS = 6 hours, 35 minutes (395 min)
> Total Time in Audit Period = 720 hour (43,200 min)

$$Measured\ Accuracy\ = \left[1 - \left(\frac{395}{43200}\right)\right] \times 100\ =\ 99.08\%$$

$$Liquidated\ Damages\ = \frac{(0.999 - 0.990)}{0.005} \times \$200 =\ \$400$$

21   KPI #21 – Time to Respond – Priority 1

21.1   Description

All Priority 1 tickets must be acknowledged within one (1) hour of ticket creation. A Priority 1 Maintenance Event is defined as any malfunction or fault that will result in the immediate loss of revenue and/or hazard to personnel.

21.2   KPI Goal

N/A

21.3   Maximum Liquidated Damages

Maximum liquidated damages are $100 per each event > 1 hour.

21.4   Testing Frequency

Testing will occur monthly.

21.5   Applicability

Time to Respond – Priority 1 KPI is applicable as follows:

> Emergency events that are directly impacting safety, or issues in which revenue and/or data loss has occurred, is imminent, or is reasonably expected to occur if repair, restoration, or remediation is not completed.

21.6 Testing Process

Measured per event, based on the ROMS Service Level Agreement (SLA) Detail Report

21.6.1 Exclusion for safety

If there are reasonable instances in which a technician cannot respond—if that response would put themselves, the travelling public, or any other being in harm or impending danger—the technician will be expected to wait until they can safely assess, access, and respond to the incident. This will be recorded in the daily log, and this time will be excluded from the calculation of this KPI.

21.7 Measurement Method

$$P1\ Response\ Time = \left(Time_{Acknowledged}\right) - \left(Time_{Created}\right)$$

21.8 Example KPI Calculation

In this example scenario, assume that during the audit period, there were 10 P1 tickets that had a response time > 1 hour.

$$Total\ Sum\ of\ P1\ Tickets\ with\ Response\ Time\ >\ 1\ hour\ =\ 10$$

$$Liquidated\ Damages\ =\ 10\ x\ \$100 =\ \$1,000$$

22   KPI #22 – Time to Repair – Priority 1

22.1   Description

All Priority 1 tickets must be repaired within four (4) hours of ticket acknowledgement.

22.2   KPI Goal

N/A

22.3   Maximum Liquidated Damages

Maximum liquidated damages are $200 per each event > 4 hours.

22.4   Testing Frequency

Testing will occur monthly.

22.5   Applicability

Time to Repair – Priority 1 KPI is applicable as follows:

> Emergency events that are directly impacting safety, or issues in which revenue and/or data loss has occurred, is imminent, or is reasonably expected to occur if repair, restoration, or remediation is not completed.

22.6   Testing Process

This KPI is measured per event, based on the ROMS Service Level Agreement (SLA) Detail Report.

22.6.1   Exclusion for safety

If there are reasonable instances in which a technician cannot respond—if that response would put themselves, the travelling public, or any other being in harm or impending danger—the technician will be expected to wait until they can safely assess, access, and respond to the incident. This will be recorded in the daily log, and this time will be excluded from the calculation of this KPI.

22.7   Measurement Method

$P1\ Repair\ Time = \left(Time_{Repaired}\right) - \left(Time_{Acknowledged}\right)$

22.8   Example KPI Calculation

In this example scenario, assume that during the audit period, there were 10 P1 tickets that had a repair time > 4 hours.

$Total\ Sum\ of\ P1\ Tickets\ with\ Repair\ Time > 4\ hours = 10$

$$Liquidated\ Damages = 10\ x\ \$200 = \$2,000$$

23 KPI #23 – Time to Respond – Priority 2

23.1 Description

All Priority 2 tickets must be acknowledged within one (1) hour of ticket creation. A Priority 2 Maintenance Event is defined as any malfunction or fault that will not result in immediate loss of revenue but will/may impact operational performance.

23.2 KPI Goal

N/A

23.3 Maximum Liquidated Damages

Maximum liquidated damages are $75 per each event > 1 hour.

23.4 Testing Frequency

Testing will occur monthly.

23.5 Applicability

Time to Respond – Priority 2 KPI is applicable as follows:

> Non-critical issues in which revenue and/or data loss is not reasonably expected to occur if repair, restoration, or remediation is not completed.

23.6 Testing Process

This KPI is measured per each event, based on the ROMS SLA Detail Report.

23.6.1 Exclusion for safety

If there are reasonable instances in which a technician cannot respond—if that response would put themselves, the travelling public, or any other being in harm or impending danger—the technician will be expected to wait until they can safely assess, access, and respond to the incident. This will be recorded in the daily log, and this time will be excluded from the calculation of this KPI.

23.7 Measurement Method

$P2\ Response\ Time = (Time_{Acknowledged}) - (Time_{Created})$

23.8 Example KPI Calculation

In this example scenario, assume that during the audit period, there were 10 P2 tickets that had a response time > 1 hour.

$Total\ Sum\ of\ P2\ Tickets\ with\ Response\ Time\ >\ 1\ hour\ =\ 10$

$Liquidated\ Damages\ =\ 10\ x\ \$75 = \$750$

24 KPI #24 – Time to Repair – Priority 2

24.1 Description

All Priority 2 tickets must be repaired within 12 hours of ticket acknowledgement.

24.2 KPI Goal

N/A

24.3 Maximum Liquidated Damages

Maximum liquidated damages are $150 per each event > 12 hours.

24.4 Testing Frequency

Testing will occur monthly.

24.5 Applicability

Time to Repair – Priority 2 KPI is applicable as follows;

> Non-critical issues in which revenue and/or data loss is not reasonably expected to occur if repair, restoration, or remediation is not completed.

24.6   Testing Process

This KPI is measured per each event, based on the ROMS SLA Detail Report.

24.6.1   Exclusion for safety

If there are reasonable instances in which a technician cannot respond--if that response would put themselves, the travelling public, or any other being in harm or impending danger--the technician will be expected to wait until they can safely assess, access, and respond to the incident. This will be recorded in the daily log, and this time will be excluded from the calculation of this KPI.

24.7   Measurement Method

$$P2\ Repair\ Time = \left(Time_{Repaired}\right) - \left(Time_{Acknowledged}\right)$$

24.8   Example KPI Calculation

In this example scenario, assume that during the audit period, there were 10 P2 tickets that had a repair time > 12 hours.

$$Total\ Sum\ of\ P2\ Tickets\ with\ Repair\ Time\ > 12\ hours\ = 10$$

$$Liquidated\ Damages\ = 10\ x\ \$150 = \$1,500$$

25   KPI #25 – Time to Respond – Priority 3

25.1   Description

All Priority 3 tickets must be acknowledged within one (1) hour of ticket creation. A Priority 3 Maintenance Event is defined as any action or event reported that will/may impact operational performance, has the potential to degrade the system performance, and has no impact to revenue collection.

25.2   KPI Goal

N/A

25.3   Maximum Liquidated Damages

Maximum liquidated damages are $25 per each event > 1 hour.

25.4   Testing Frequency

Testing will occur monthly.

25.5   Applicability

Time to Respond – Priority 3 KPI is applicable as follows;

Any action or event reported that will/may impact operational performance, has potential of degrading the System performance, and has no impact to revenue collection.

25.6 Testing Process

This KPI is measured per each event, based on the ROMS SLA Detail Report.

25.6.1 Exclusion for safety

If there are reasonable instances in which a technician cannot respond—if that response would put themselves, the travelling public, or any other being in harm or impending danger—the technician will be expected to wait until they can safely assess, access, and respond to the incident. This will be recorded in the daily log, and this time will be excluded from the calculation of this KPI.

25.7 Measurement Method

$$P3\ Response\ Time = (Time_{Acknowledged}) - (Time_{Created})$$

25.8 Example KPI Calculation

In this example scenario, assume that during the audit period, there were 10 P3 tickets that had a response time > 1 hour.

$$Total\ Sum\ of\ P3\ Tickets\ with\ Response\ Time\ > 1\ hour = 10$$

$$Liquidated\ Damages\ = 10\ x\ \$25 = \$250$$

26 KPI #26 – Time to Repair – Priority 3

26.1 Description

All Priority 3 tickets must be repaired within 36 hours of ticket acknowledgement.

26.2 KPI Goal

N/A

26.3 Maximum Liquidated Damages

Maximum liquidated damages are $50 per each event > 36 hours.

26.4 Testing Frequency

Testing will occur monthly.

26.5 Applicability

Time to Repair – Priority 3 KPI is applicable as follows;

> Any action or event reported that will/may impact operational performance, has potential of degrading the System performance, and has no impact to revenue collection.

26.6 Testing Process

This KPI is measured per each event, based on the ROMS SLA Detail Report.

26.6.1 Exclusion for safety

If there are reasonable instances in which a technician cannot respond—if that response would put themselves, the travelling public, or any other being in harm or impending danger—the technician will be expected to wait until they can safely assess, access, and respond to the incident. This will be recorded in the daily log and this time will be excluded from the calculation of this KPI.

26.7 Measurement Method

$P3\ Repair\ Time = (Time_{Repaired}) - (Time_{Acknowledged})$

26.8 Example KPI Calculation

In this example scenario, assume that during the audit period, there were 10 P3 tickets that had a repair time > 36 hours.

$Total\ Sum\ of\ P3\ Tickets\ with\ Repair\ Time\ > 36\ hours\ =\ 10$

$Liquidated\ Damages\ =\ 10\ x\ \$50\ =\ \$500$

27   KPI #27 – Inventory

27.1   Description

All CTRMA hardware, including that which is currently installed, maintained as spares, and RMA (if applicable), shall be included in an Annual Physical Inventory Audit Program, as agreed upon by Kapsch and CTRMA.

27.2   KPI Goal

All elements described in Section 27.1 shall be inventoried annually and submitted with the yearly February Monthly Maintenance Report (MMR).

27.3   Maximum Liquidated Damages (per calendar month)

Kapsch cannot invoice for the monthly maintenance fee without submitting this audit.

27.4   Testing Frequency

Testing will occur annually.

27.5   Testing Process

n/a

-END OF DOCUMENT-

Appendix A   Appendix A MVD Calibration Verification Sheet

The MVD Calibration Verification Sheet is displayed on the following pages.

MVD Calibration Verification Sheet

Detector ID	05100 - NB	Associated Cabinet	DP1
Mounting Height		Setback	

TEST SETUP

References	1. Wavetronix MVD Calibration Guide
Requirements	**(modified) - ITS-327 (4.18.8.1**) Total traffic and per lane volume must be within 10% of visually confirmed counts. *Note: 5% stated erroneously in spec. HDSmart datasheet states 90% accuracy (10% of visually confirmed counts), not 95%.* **ITS-329 (4.18.8.3)** Occupancy must be within 10% of field verified calculations. **ITS-331 (4.18.8.4)** These requirements apply to all MVD locations. Testing must require the use of live traffic. **ITS-332 (4.18.8.5)** The MVD shall provide full coverage of the managed lanes, general purpose lanes, frontage roads, and all ramps.
Pre-Requisites	*1. Initial MVD alignment procedure completed (per wavetronix mvd calibration guide).* *2. MVD configured for coverage of all required lanes and bin classes (per mvd configuration datasheet).* *3. Live traffic on the roadway.*
Test Setup Instructions	*1. One or more persons as needed to cover all lanes during volume and bin testing.* *2. One person with accurate watch synchronized (+/- 1 sec) to MVD time.* *3. Laptop connected to MVD via HDSmart configuration utility to review MVD data log. Also must be in close proximity to other test personnel during the test.*

MVD Calibration Verification Sheet

MVD Configuration

With laptop logged in to MVD via HDSmart utility, check all configuration settings are correct, per the mvd configuration sheet and mvd lane configuration list.

Configuration Verified ☐

VEHICLE COUNT VERIFICATION

1. Using the thumb clicker, count cars in assigned lane for a minimum 5 minute period (note: 5 cars minimum must be counted). Record total counts to the right.

Note: Two people will be simultaneously counting up to 2 lanes each.

Note: In addition to counting for a mimimum of 5 minutes, a minimum of 5 vehicles must be counted for each lane to get an acceptable sample size.

2. Record values reported by the MVD the right.

3. Calculate and record Difference and %Accuracy values.

LANE 1 (closest lane) COUNTS

Start Time	Clicker	MVD	End Time	Difference	% Accuracy
2:04pm	30	29	2:08pm	1	96.7%

LANE 2 COUNTS

Start Time	Clicker	MVD	End Time	Difference	% Accuracy
2:08pm	30	26	2:12pm	4	86.7%

LANE 3 COUNTS

Start Time	Clicker	MVD	End Time	Difference	% Accuracy
2:12pm	30	26	2:16pm	4	86.7%

LANE 4 COUNTS

Start Time	Clicker	MVD	End Time	Difference	% Accuracy
				0	#DIV/0!

LANE 5 (furthest lane) COUNTS

Start Time	Clicker	MVD	End Time	Difference	% Accuracy
				0	#DIV/0!

Total Volume Counts
1. Add up and record clicker values from lane#s 1-4 above.
2. Record values reported by the MVD to the right.
3. Calculate and record Difference and %Accuracy values.

Total Counts (add clicker counts above, compare with total volume logged by MVD)

Start Time	Clicker	MVD	End Time	Difference	% Accuracy
2:04pm	90	81	2:16pm	9	90.0%

MVD Calibration Verification Sheet

Test Lead Signature	Kevin Pruitt	Date Completed	22-Nov-21

END OF DATA SHEET

TOLL COLLECTION SYSTEM MAINTENANCE SERVICES

SCOPE OF WORK

CENTRAL TEXAS REGIONAL MOBILITY AUTHORITY

TOLL COLLECTION SYSTEM MAINTENANCE SERVICES

SCOPE OF WORK

M1.0 General

M1.01. Background

The Central Texas Regional Mobility Authority (CTRMA) designated the US183-A Turnpike Project as the first priority for implementation in conjunction with the TxDOT plans for development of the Central Texas Turnpike Project (CTTP). Subsequent to the implementation of the design/build process for the US183-A Turnpike Project, the Capital Area Metropolitan Planning Organization (CAMPO) approved the implementation of the proposed Toll Implementation Plan to construct additional capacity on various segments of highway network in the CAMPO Long-Range Plan as toll road facilities as part of the CTRMA Turnpike System. Several of the toll road segments are in various stages of project development, in design or construction by TxDOT, and it is intended that these proposed segments as identified in *Attachment D* also will be implemented by the CTRMA as parts of its Turnpike System. The Toll Collection System for the various segments of the CTRMA Turnpike System as shown in *Attachment D* includes various combinations of Electronic Toll Collection (ETC), and Express ETC.

M1.02. Summary Scope of Work

The Contractor shall maintain the portions of the Toll Collection System that have received Acceptance as they come on line until Project Acceptance at which time the entire CTRMA Toll Collection System shall be under the Maintenance Services Agreement ("the Maintenance Contract"). For the purpose of scoping the work and the fee structure, the two phases of the Project are considered separate.

M2.0 Scope of Work Elements

M2.01. Scope of Work

The Contractor's responsibilities shall include preventive, predictive, corrective and emergency maintenance of the entire CTRMA Toll Collection System.

1. **Lane Systems**
    - In-lane Toll Collection System Software
    - Lane Controllers
    - AVI System
    - AVC System
    - VES Equipment and Computers
    - Equipment in road-side cabinets

2. **Plaza System**
    - Toll Collection System Software
    - Plaza Computer Systems (Operating System, Database, Disks, etc)
    - Plaza Workstations
    - Emergency Generators
    - UPS
    - Communications Equipment

3. **Host System**
    - Toll Collection System Software including MOMS and Security Access Software
    - Host Computer Systems (Operating System, Database, Tape Library, Disks etc.)
    - Security Access System
    - Communications Equipment
    - Host Workstations
    - Host Printers and other Toll Collection Equipment

M3.0 MoPac Express Lane Operations and Staffing

The following overview outlines the basic concept of the MoPac Operations, Image Review and Maintenance and Support of the MoPac Express Lanes Project (Express Lanes). Once the project is in revenue collection The Express Lanes are Intended to serve as a reliable north-south travel option along MoPac from Parmer Lane to Lady Bird Lake.

This Scope of Work includes the services, provided by Kapsch TrafficCom USA (formerly known as Schneider Electric) as the Tolls Systems Integrator (TSI), associated with maintenance and operation of the MoPac Managed Lanes project which Includes the Express Lanes Command Center (ELCC), Image Review, Trip Building and monitoring and maintenance of the Express Lanes. The TSI is responsible for the operation and maintenance of the variable tolling system (Toll System) and related Intelligent Transportation Systems in support of the Toll Management System (TMS) described in Toll System and Toll-related ITS Design, Installation, and Testing, Work Authorization 10 (WA#10). The TMS components include, but not limited to closed circuit television (CCTV) cameras, traffic detection system (TDS), variable toll message signs (VT'MS), VTMS cameras and VTMS Automatic Vehicle Identification (AVI) equipment. The TSI shall meet the Service Level Agreements and Key Performance Indicators provided in Exhibit 5-1: Service level Agreements and Key Performance Indicators within WA#10. For Maintenance, the TSl's duties, Responsibilities and Liabilities in regard to Performance Measurements are contained within the Maintenance Contract, executed March 3, 2007; Sections 7 Contractor Representations and Warranties and 10.0 Performance Measurement.

The Express Lanes will be in operation and collecting tolls 24 hours a day, 7 days a week, 365 days a year based on current approved business rules, with the exception of limited
periodic maintenance intervals.

The Mobility Authority will be responsible for operations of the EXPRESS LANES.

M3.01. Scope of Work Summary

This Scope of Work covers two tasks outlined below:

Task 1 – Operations: Manage and operate the Express Lanes Command Center (ELCC) located at 104 North Lynnwood Trail, Cedar Park, Texas 78613, for the purposes of monitoring, supporting Austin Public Safety staff in returning the Express Lanes to normal operational flow, image review and trip building. The term of the Operations Contract shall be for an initial period of one (1) year (the "Initial Term"), commencing on the Effective Date of Day One of Toll Revenue Collection. The Initial Term shall be extended automatically for successive periods of one (1) year each unless and until terminated otherwise. The Operations Contract may be terminated by either party upon the expiration of the Initial Term or any subsequent one-year extension of this Operations Contract, provided that at least ninety (90) days' written notice is given to the other party prior to the expiration of the Initial Term and any additional subsequent terms.

Task 2 – Maintenance: Provide monitoring, operations and maintenance support for roadside and Intelligent Transportation (ITS) Equipment identified in WA #10, Exhibit A; Section A3.04, to monitor and validate the accurate operations of the Express Lanes, the Project Host and the Toll System

M3.01.01. <u>Task 1 - Operations</u>

- The TSI shall staff the ELCC during peak hours and in operations from 5:30am – 8pm, 5 days a week excluding holidays in accordance with the Work Breakdown Structure and Staffing Plan (Exhibit B). In no event shall the TSI operator leave the ELCC unstaffed during an emergency, active event or incident, even at the end of a shift.
- This task consists of work necessary to provide on-site monitoring of the ELCC and the systems, variable pricing engine, toll rates, performance of manual tasks necessary for the system's effective operation, and the operations of the ELCC.
- TSI shall provide on-site monitoring and traffic control device operation. TSI shall provide the required level of personnel necessary to cover shifts. Shifts can be split or modified, as long as the appropriate staffing levels are maintained
- TSI shall provide continuous monitoring of the variable pricing engine results, participate and lead toll rate discussions, provide tuning and configuration updates to the parameters required to meet the CTRMA goals.
- TSI shall provide on-site monitoring of closed-circuit television, police radio channels, public safety computer-aided dispatch terminals, Internet-based information sources and software programs
- The EXPRESS LANES will be operated with variable pricing. Operators will strive to maintain reliable travel conditions through the use of variable tolls, established to proactively monitor demand on the facility. Reliable travel conditions are defined as Level of Service (LoS) C or better, with average speeds of 53 mph or higher.

- EXPRESS LANES operations will be monitored, and pricing may be adjusted manually if necessary, to achieve the desired effect on traffic. However, it is the intent the system will operate in an automated manner, to the extent possible, under normal traffic conditions. Traffic sensors will be used to monitor continuously the operating conditions of the EXPRESS LANES and a variable toll rate will be calculated to manage demand, in order to maintain an acceptable LoS.

Operations Staffing

TSI shall provide the services including, but not limited to, management, administrative and technical aspects of the Operations Contract. All activities are required to be tracked, meeting minutes produced, and coordination activities documented.

TSI shall provide CTRMA with Operations Manager for the life of the Contract, as well as an Operations Supervisor for the Operations staff. Any changes to the TSI Operations Manager or any of the other indicated personnel in this Contract shall be subject to review and approval by CTRMA in writing. The hiring and training timeline of these personnel is referenced in the Work Breakdown Structure and Staffing Plan (Attachment A)

A3.2 ELCC Supervisor and Operators

TSI shall provide the names and resumes for all management positions. TSI shall provide the names for all non-management positions. Operations staff classifications will include the following TSI positions, as a minimum:
   1. ELCC Shift Supervisor
   2. ELCC Operators (2)

In addition to a ELCC Shift Supervisor, initially it is anticipated that there will be 2 full-time equivalent ELCC Operators covering the following shifts, 13 hours per day and five (5) days per week:
   1. Morning shift: 5:30 AM to 1:30 PM
   2. Afternoon shift: 12:00 Noon to 8:00 PM

Purpose

The primary purpose of the Operations Staffing is to provide a weekday AM and PM peak staff to operate the EXPRESS LANES, which includes:

1. Monitor, direct, and administer the personnel designated to operate and support the Tolling, TMS, and Managed Lanes system.
2. Perform traffic incident detection and verification using the TMS and available tools.
3. Provide reporting and announcement of roadwork, incidents and events.
4. Support the CTECC by reporting incidents when detected, as well as support First Responders in incident management and recovery.
5. Coordinate operations & roadwork information with various partner agencies.
6. Provide training of staff and updates of procedures to facilitate the improvement of operations and day-to–day interaction.
7. Provide support during emergencies, storms, and other significant events.
8. Support the development of continuous improvement processes through performance measures and self-assessments.
9. Furnish materials, supplies, tools, equipment, labor, and other incidentals necessary for the work in accordance with project documents.

Duties

- The duties for Task 1 consist of all work necessary to manage all of the Personnel included, but not limited to, general oversight of ELCC operators, Quality Assurance and Quality Control, operational assistance during emergencies; weather-related storms, and other significant events as well as general contract administration. It also includes participation in meetings by the TSI.
- TSI personnel shall be scheduled to work Monday through Friday from 5:30am – 8:00pm. In no event shall the TSI operator leave the ELCC unstaffed during an emergency, active event or incident, even at the end of a shift.

Sub-Task Descriptions for Task 1 - Operations:

a. TSI shall employ, train, supervise, and schedule ELCC operators. The hiring and training timeline of these personnel is referenced in Exhibit B, MoPac Staffing Plan. This shall include accommodating vacations, sick leave, and other absences of CTRMA Operations personnel by providing adequate training and supervision of relief operators, and on-call personnel.

b. TSI Operations personnel shall be responsible for issuing a work order for equipment repair and helping to establish priorities for repair of failed equipment shall also be considered part of this task.

c. TSI shall attend regular meetings with CTRMA to cooperatively identify and prioritize work to be performed.

d. TSI shall maintain records and documentation as directed to support the overall operations of the ELCC and provide data for documenting performance measures and progress.

e. TSI shall participate in post-incident debriefings with all appropriate Agencies involved in managing such major traffic incident, to determine whether existing operating procedures should be changed.

f. TSI personnel assigned to this task shall be available to respond to electronic notifications within one hour during off-duty hours to provide assistance as appropriate. In the event of a significant incident or situation outside of the scope of the Standard Operating Procedures.

g. TSI shall provide adequate staff and resources for all tasks and activities throughout the duration of the contract, including planned and unplanned staff absences, emergencies, storms, and other significant events.

h. TSI shall prepare and submit monthly invoices and progress reports in accordance with applicable CTRMA requirements. Clerical/Administrative support staff will prepare consultant invoices, reports, forms, letters, and any other official project related correspondences, as well as hiring of staff and or other personnel related duties. The Clerical/Administrative support staff are not expected to have ELCC-related activities as a full-time task nor are they to be based at the TIMC.

i. During peak periods, on holiday weekends, special events, and/or emergency conditions, greater levels of staffing may be required by CTRMA. If CTRMA deems additional TSI personnel are necessary to operate the expanded functions of the MoPac project, the TSI shall provide extra staff (provided a minimum of four-hour notice is provided) for the short-term. In no event shall the TSI operator leave the ELCC unstaffed during an emergency, active event or incident, even at the end of a shift. If CTRMA determines the additional ELCC staff will be a permanent position requirement, the staffing level shall be adjusted via supplemental agreement. Additional pricing estimates shall be provided upon request.

j. TSI shall participate in the monitoring of traffic incidents by issuing appropriate notifications to the CTECC and activating motorist information resources from the ELCC during the previously given hours of operation. All other times the CTECC will be monitoring for incidents. Problems encountered with any of the systems must be reported immediately to the appropriate systems support personnel as described in the Standard Operating Procedures. TSI shall update social media as defined in the Standard Operating Procedures on behalf of the CTRMA.

k. TSI shall provide coordinated monitoring of incidents with CTRMA and outside agency personnel. Incident monitoring shall be performed in accordance with the Standard Operating Procedures.

l. TSI shall answer phone inquiries and coordinate incident-related activities with operational partners and provide them with the necessary information about traffic conditions. Telephone calls from the media shall be referred to appropriate CTRMA Personnel.

m. TSI shall perform Trip verification activities, inspection of queued images within 48 hours to verify posting of toll rates and charges for trips.

n. TSI shall perform Trip verification activities, including visual inspection and verification of toll charges for Trips within 72 hours as described in the Image Review Operational Procedures.

o. TSI will provide Image Reviewed plates for trip building purpose and image-based tolling that will be sent directly to Image Billing vendor as described in the Image Review Operational Procedures.

M3.01.02. <u>Task 2 - Maintenance</u>

- TSI shall provide monitoring, support and maintenance for all items installed and integrated as part of the MIP. These items include, but not limited to items identified in WA #10, Exhibit A, Appendix F and Exhibit H: four (4) gantry locations for toll system installation, Variable toll message signs (VTMS) and VTMS cameras, traffic detection systems, CCTV cameras, Project Host, servers, generators, uninterruptable power supplies, toll collection equipment, cameras, switches, cabling, Violation Enforcement System, software and configuration items for Automatic Vehicle Identification, Automatic Vehicle Detection System, Image Capture and Processing System, Digital Video Audit System.

- TSI shall ensure the MoPac Express Lanes system meets the Service Level Agreements and Key Performance Indicators identified and agreed to in Work Authorization #10, Section 5 Performance Requirements.

    Sub-Task Descriptions for Task 2 – Maintenance:

    a. Four toll collection points are defined on the MoPac Expressway. TSI will be responsible for maintaining the entirety of the Express Lanes, including all components provided directly by the system integration contract with Kapsch TrafficCom.

    b. On-site monitoring of traffic control device operation, managed lanes, and variable message sign system of the systems includes monitoring of and dialog with, but not limited to:

        i. The relevant software program and the associated/related field equipment; and
        ii. The software computer programs that allow operators to create/activate/deactivate messages on variable message signs. Each of these sets of computer programs provides for operator dialogue using computer terminals.

M3.02.   Contract Support

This task covers work by TSI to update Standard Operating Procedure manuals for use in day-to-day operations and to provide necessary training. CTRMA shall review and approve proposed training procedures. TSI shall provide materials to CTRMA documenting the training of personnel. This task also includes proactively assisting CTRMA in minimizing the impact of construction, maintenance, and other activities on the motoring public.

5.1 Sub-Task Descriptions for Support Task:

a. TSI shall work with CTRMA to develop and update the Standard Operating Procedures (SOP) Manuals for use. Due to the nature of operations, this shall be an ongoing task that will take place at any time an SOP needs to be updated. TSI shall, at a minimum, review all SOPs on a semi-annual basis and provide CTRMA with recommendations for changes to address current operational conditions.

b. TSI shall provide training to new operations personnel and in-service training to existing staff. The training shall be based on the current CTRMA SOP manuals. Training shall be provided on an as-needed basis as TSI staff is transitioned into the project; when new or significant changes are applied to SOPs or software programs; or when individual operator performance indicates the need for remedial training. Training shall include formal classroom style exercises and hands-on training. The training shall provide for knowledge checks to ensure they are competent prior to their being assigned to the operations tasks. Training shall also include side-by-side mentoring in the form of assignment to the operations tasks for at least one week under the supervision of a Supervisor. This applies to both new operators and operators for whom remedial training is required.

c. In order to keep the staff current with their abilities, TSI shall conduct "in-service" training to all staff. This shall be in the form of written exercises, or other CTRMA approved methods, and shall take place at least once per month.

d. Maintenance Personnel and other entities with approved, planned lane closures on State Highways will send information to the TMC describing the details of the activities and lane closures in advance of the closure. TSI personnel will enter this information into the TMS software, prepare DMS plans for the work, and forward non-maintenance work and DMS plan information to appropriate CTRMA personnel, in accordance with Standard Operating Procedures.

e. On a daily basis, TSI personnel shall review systematically the roadwork information received at the ELCC and identify those locations competing needs for lane closures exist. TSI personnel shall notify the appropriate parties when a conflict is identified. It will be the responsibility of the competing parties to resolve the conflict.

f. On a daily basis, and in accordance with Standard Operating Procedures, TSI personnel shall prepare and distribute a summary report of the scheduled roadwork and send roadwork notifications to CTRMA personnel.

M3.03. <u>PERFORMANCE MANAGEMENT</u>

TSI shall carry out all Work in accordance with the Project Schedule and in a prompt, skillful and careful manner, using qualified personnel and in accordance with the "Standard of Care" defined as that level of care and skill ordinarily exercised by other employees currently practicing in the same locality under similar conditions. Employees shall perform the Work in a

manner that is coordinated with contractor activities on the Project, and in accordance with the terms and conditions of this Work Authorization and the Agreement.

TSI will ensure that operators are compliant with established corporate policy regarding performance evaluation, training, and mentoring. Performance reviews and improvement will also be in accordance with established corporate guidelines.

M3.04. <u>Staffing Management</u>

TSI shall ensure employees meet the following minimum requirements:

1) Current driver license or Texas Identification (ID) card in accordance with the Texas Statutes.
2) Minimum age of eighteen (18) years old.
3) Proof of education, certifications, diploma(s), degree(s), professional affiliation(s).
4) Document the minimum of the last five (5) employment positions unless having worked less after graduating high school or college.

TSI shall conduct reference checks on all TSI personnel proposed to be used on/during this Contract and will keep all reference records on file and available to CTRMA for the Contract period.

TSI, during the Contract period, shall, prior to hiring, have resumes of all proposed staff and all new hires along with copies of Driver's Licenses or State of Texas issued ID on file for CTRMA review.

M4.0 Maintenance Plan

The Contractor shall create a Maintenance Plan that covers all aspects of the CTRMA Toll Collection System pertinent to the Scope of Work.

The Maintenance Plan will be updated periodically by mutual agreement of the parties as they deem reasonably necessary.

M4.01. <u>Coverage</u>

The Contractor will provide maintenance services on a seven (7) day a week/twenty-four (24) hours a day basis with the following response and repair times depending on severity of incident, except where otherwise specified in an approved roadway maintenance manual.

– A Priority 1 Maintenance Event is defined as any malfunction or fault that will result in the immediate loss of revenue and/or hazard to personnel.

– Priority 2 Maintenance Event is defined as any malfunction or fault that will not result in immediate loss of revenue but will/may impact operational performance.

– A Priority 3 Maintenance Event is defined as any action or event reported that will/may impact operational performance, has potential of degrading the System performance, and has no impact to revenue collection.

For purposes of the above, response time is defined as the period beginning when the Contractor is notified of a problem and ending when the Contractor's maintenance technician creates a ticket. Repair time is defined as the period beginning when the Contractor's ticket is acknowledged and ending when the fault is corrected. Response and repair time for every maintenance event will be recorded and made available to the CTRMA.

For all remote Express Toll Locations on the State Highway System, the Contractor shall work with CTRMA in scheduling and coordinating any maintenance, adjustments, and repair activities involving active traffic lanes for setting up the lane and accessing the equipment in the lane. All maintenance, adjustments, and repair activities within State highways will be subject to the review and approval by TxDOT and the CTRMA.

M4.02. Notification Procedures

The Contractor may be notified of Toll Collection System malfunctions, problems, and discrepancies in several different ways. There can be verbal notification from a CTRMA employee, written notification from an authorized CTRMA employee, verbal notification from CSC/VPC staff, and MOMS messages from the MOMS or other MOMS notification system (i.e., automatic paging, etc.).

In all cases, it shall be the responsibility of the Contractor to log all reported problems with all pertinent information concerning the problem into MOMS. After receiving notification, the Contractor shall confirm the problem directly with the reporting

individual or other CTRMA personnel at the location of the problem. The Contractor shall then dispatch the appropriate maintenance personnel to resolve the problem.

M4.02.01. Verbal Notification

Verbal notification of a maintenance call shall be defined as in-person, telephone, or pager call, and subsequent return telephone call by the Contractor. In all cases, the first conversation with or page of the Contractor shall signify the start of response time for purposes of measuring the Contractor's response time.

M4.02.02. Written Notification

Written notification shall be defined as a written description of a problem, typically provided by the CTRMA or the VPC.

M4.02.03. MOMS Notification

MOMS notification shall consist of the MOMS software identifying a problem with the system. MOMS message information shall be provided in the maintenance reports, as described elsewhere in this document.

M5.0 Spare Parts

Spare parts prior to Project Acceptance will be procured through the Toll Collection System Contract. Notwithstanding anything to the contrary in this specification, the Contractor shall purchase on behalf of the CTRMA (and at the CTRMA's expense) an initial stock of spare parts and equipment for the Toll Collection System at such time as the CTRMA and the Contractor shall mutually agree at the cost of such spare parts and equipment without any 10% mark-up.

M5.01. Procurement

The Contractor shall purchase all spares on behalf of the CTRMA in a manner to ensure that the CTRMA obtains the benefit of all warranties associated with such spares. The cost of the spare parts shall not include any mark up and shall be agreed to prior to the Effective Date. The Contractor shall maintain and track the inventory of all spares and consumables for the CTRMA using the MOMS and shall provide the CTRMA with a list itemizing all spares and consumables in the CTRMA's inventory as reasonably requested, but not more frequently than once a month. All of the CTRMA's spares and consumables shall be maintained by the Contractor free and clear of all liens and encumbrances of any kind whatsoever at locations to be agreed upon between the CTRMA and the Contractor. The CTRMA shall have the right to inspect the spares and consumables inventory

during normal business hours and shall give the Contractor written notice any time the CTRMA removes any of its spares or consumables.

M5.02. <u>**Inventory Management**</u>

The Contractor's performance of the Maintenance Services is predicated on there being an adequate spares inventory available. The Contractor shall provide no less frequently than annually a list of recommended spares quantities, and it is the CTRMA's responsibility to approve the purchase of the spares to be made. The CTRMA will hold harmless the Contractor in the event spares are not available as a consequence of the CTRMA's not accepting the Contractor's recommended quantity of spares. The Contractor shall hold harmless the CTRMA in the event spares and/or consumables are not available as a consequence of the Contractor's failure to purchase the spares and/or consumables ordered by the CTRMA.

The Contractor shall be responsible for providing all miscellaneous repair parts and materials costing less than $20 per item, at its own expense, which shall include, but not be limited to, fuses, touch-up paint, screws and nuts, wire, connectors, cables, labels, and insulating tape, as required, to comply with the requirements of these specifications. The Contractor will provide normal shop consumables (e.g., solder, lubricants, cleaning rags, etc.) and spares costing less than $20 per item, excluding toll system consumables (e.g., magnetic media, batteries, receipt printer paper, light bulbs, etc.), at no additional cost to the CTRMA.

The Contractor shall cooperate with and assist the CTRMA as reasonably necessary to ensure that all spare parts, equipment and other CTRMA owned property stored or otherwise located on the Contractor's leased property shall not be subject to any risk of being confiscated, claimed, attached, or withheld by the Contractor's landlord, any of the Contractor's creditors or any similar risk. This cooperation shall include, but not be limited to, affixing appropriate labeling to all such property. The Contractor's Maintenance Facility and/or any location where CTRMA equipment is stored shall be secured and connected to the Security Access System. It is also recommended that the Contractor's Maintenance Facility be part of the CTRMA network and all Contractor access to the CTRMA System be made through this network. It is the Contractor's responsibility to ensure that the Contractor Maintenance Staff have access to the MOMS and all the required connections are established.

M6.0 Staffing

As of the Effective Date, the Contractor shall have the following full-time personnel situated in Austin. Changes in the scope of work, including, but not limited, to the addition or subtraction of lanes and/or equipment may cause changes in the staffing levels.

- Maintenance Manager (who shall be responsible for overseeing the performance of the Service)

- Maintenance Technicians
- Network/System Engineer (can be remote)

An office housing the administrative functions and the central repair depot (including the spares warehouse) will be located in the Austin metropolitan area.

A senior employee of the Contractor shall be identified with overall responsibility for overseeing the performance of the Maintenance Contract and managing the Maintenance Services.

The Contractor shall ensure that the field maintenance team has technical support in the areas of radio frequency, hardware, systems, communications and software.

M7.0 Personnel Training

The Contractor's field technicians shall have completed training courses, as evidenced by the resumes provided by the Contractor to the CTRMA, prior to being assigned to work on the CTRMA Toll Collection System. The Contractor shall provide for any necessary supplemental training of all maintenance technicians for the Toll Collection System, which shall be scheduled such that it will be completed no later than one (1) week prior to field installation of the any new lane configurations. The training shall consist of a minimum of two (2) weeks of both hands-on classroom instruction and on-the-job training.

M7.01. Staff Assignments

Maintenance staff shall be part of the Contractor's field installation team to obtain first-hand experience with the equipment.

The Contractor's Maintenance Technicians responsible for the field repairs shall be trained for major module/PC board swap-out. The Contractor's Technicians, because of experience at the bench level, shall also be trained to repair equipment at the component level as needed.

M7.02. Training Materials

Training materials shall consist of maintenance manuals, vendor manuals and other documentation that may be provided by the Contractor or by the CTRMA, as well as classroom training materials to be developed by the Contractor.

M7.03. Training Program

The content of the training course shall contain but not be limited to the following:

- Use of maintenance documentation such as maintenance manuals, drawings, parts lists and vendor manuals

- A maintenance program showing personnel assignments, transportation requirements and communications

- Systems overview

- Theory, use, preventive maintenance, troubleshooting, diagnostics, repair and testing of the lane to plaza to host interaction ("System"), lane to plaza interaction ("Sub-system"), and repairs to equipment or components (assembly/ sub-assembly/ component), and lane operations

- System preventive maintenance at the host, plaza and lane levels, including schedules

- Maintenance facilities (including equipment)

- Corrective and emergency maintenance procedures (troubleshooting, diagnostics, repair, testing and post-maintenance)

- Spare parts and spare equipment provisioning

- Use of maintenance tools

- Response times, expected repair times

- Maintenance facility procedures

- Maintenance forms and maintenance reports

The Contractor's Maintenance Manager shall attend the training course with the Maintenance Technicians and the CTRMA staff shall also attend the training. The Contractor shall establish procedures for training new-hire or replacement personnel and shall provide refresher training for the existing maintenance force. New hire or replacement personnel shall receive the same hands-on classroom and on-the-job training as specified in this section before being assigned official maintenance duties.

The Contractor shall keep training records on all maintenance personnel. The CTRMA shall be allowed to audit maintenance personnel qualifications and training records at any time during this Contract.

The Contractor shall supply training procedures for maintenance personnel for CTRMA approval not less than 60 days prior to the training start date.

M8.0 Safety

The Contractor shall adhere to the CTRMA's safety procedures set forth in the Maintenance Plan.

M9.0 Reporting Requirements

The CTRMA and its Representatives shall always have access to all service records.

M9.01. Field/Shop Maintenance Records

The Contractor shall maintain current and accurate records for all field and shop maintenance work. The Contractor shall prepare a service report every time service is performed for corrective or emergency work and such information shall be entered MOMS. The report shall include, but not be limited to notification time, notification procedure (verbal, written, or MOMS), plaza ID and lane number (if in-lane equipment) or equipment location, toll collector's ID number (if a collector is in the lane), equipment description, work or service performed, reported fault, parts used and the time the service was started and completed. One copy of all service reports and records shall be forwarded to the CTRMA once every month. All preventive and predictive maintenance activities shall be reported in the same manner as corrective and emergency maintenance work.

M9.02. <u>Summary Reports</u>

Monthly maintenance summary reports shall be prepared and submitted to the CTRMA. These reports shall include, but not be limited to, average repair times, failure statistics, spare parts and spare equipment used, spare parts and spare equipment disposition (i.e. returned to manufacturer for repair, in maintenance shop for repair, etc.), total down time of the equipment and other summary information for all classes of equipment.

M10.0   System Documentation

The Contractor shall maintain one full set of all Toll Collection System documentation including, but not limited to, as-built drawings, toll equipment service manuals, computer manuals, software documentation, parts lists and other data as may be required for record purposes at the toll maintenance shop. In addition, one (1) versioned set of complete documentation shall be maintained by the Contractor in a documentation management system.

The Contractor shall furnish all maintenance personnel with appropriate System documentation as may be required to perform their respective duties.

All System documentation shall be recorded at the toll maintenance shop. The documentation provided and/or assembled under the Maintenance Contract shall be considered proprietary and confidential. The Contractor's employees shall not reproduce the documentation or discuss the contents of the documentation with the CTRMA toll collectors or other unauthorized personnel.

M11.0 Performance Measurement

The CTRMA will review the Contractor's performance on a monthly basis, utilizing the monthly summary reports provided by the Contractor, in addition to input from the CTRMA staff. Performance will be measured by:

- Comparing average response times and repair time in each "Priority" category described under "Coverage" in Subsection M3.01 for the current month, year to date, and since Notice to Proceed for this Maintenance Contract with the requirements specified in the Technical Requirements.

- Failure to keep accurate records or otherwise improperly reporting maintenance activities.

- Review of spare parts and spare equipment availability

As described in the Restated Maintenance Agreement, the Contractor will be notified in writing of deficient performance and shall take corrective actions.

M12.0 Key Performance Indicators

Kapsch proposes the following Key Performance Indicator (KPI) measurements for Maintenance services. These KPIs are measurable values that demonstrate achievement of key business objectives, while also including either liquidated damages for missed targets or lost revenue.

Audits conducted by CTRMA or its third party vendor will be completed according to the schedule set forth below or at CTRMA's discretion.

KPI ID	KPI Name	Key Performance Indicator Description	KPI	Maximum Liquidated Damages (per calendar month)	Testing Frequency
1	AVD	The vehicle detection subsystem shall detect 99.90% of vehicles passing through the Toll Zone once and only once under all conditions within the Design specification described in the requirements, including vehicles in the shoulders and straddling the lane and shoulder. Kapsch will reconcile discrepancies from CTRMA audits. Variance may be dependent on vehicle volume.	99.90%	$200 per gantry location, per each 0.1% below threshold	Audits by CTRMA, and executed by CTRMA, shall be evenly spread over the course of 12-months (e.g. approximately 1/12th of locations audited each month), with minimum transaction count of 3,000, as determined by audit confidence as a threshold.
2	AVC	The AVC subsystem shall correctly classify 99.50% of all detected vehicles at speeds from 5 mph up to and including 100 mph, including vehicles straddling the lanes. Shoulders are excluded from this calculation. Kapsch will reconcile discrepancies from CTRMA audits. Variance may be dependent	99.50%	$200 per gantry location, per each 0.1% below threshold	Audits by CTRMA, and executed by CTRMA, shall be evenly spread over the course of 12-months (e.g. approximately 1/12th of locations audited each

		on vehicle volume.			month), with minimum transaction count of 3,000, as determined by audit confidence as a threshold.
3	AVI	The AVI subsystem will correctly detect, read and assign to the correct vehicle 99.90% of all properly installed Transponders on all detected vehicles at speeds from 5 mph up to and including 100 mph, including vehicles in the shoulders and straddling the lanes.	99.90%	$200 per gantry location, per each 0.1% below threshold	Audits by CTRMA, and executed by CTRMA, shall be evenly spread over the course of 12-months (e.g. approximately 1/12th of locations audited each month), with minimum transaction count of 5,500, as determined by audit confidence as a threshold.
4	LPIC	The LPIC subsystem will capture one front human readable license plate image or one rear human readable license plate image and associated to the correct vehicle for 99.00% of all detected vehicles traveling at speeds from 5 mph up to and including 100 mph, including vehicles straddling the lane and shoulder.	99.00%	Estimated revenue loss (calculated using liquidation rate), per gantry location, for performance below threshold.	Monthly
5	IR	For transactions rejected by the manual review process, less than 1.00% shall have incorrect code-off results.	<1.00%	$200 per each 0.1% below threshold	Quarterly performance audit, to be executed by Kapsch, with minimum transaction count of 1,500 per Code-Off category, as determined by audit confidence as a threshold.

6	Trip	99.50% of all transactions shall be correctly assembled into trips.	99.50%	$200 per roadway direction, per each 0.1% below threshold	Monthly
7	Trip Processing	100% of all trips shall be transmitted to the CTRMA Data Platform System (DPS) within six (6) calendar days of the exit transaction of the trip.	100%	For lost or uncollectable transactions: 1) Actual revenue above $5,000 AND 2) any direct damages associated with the loss. For transactions transmitted >6 days and <=30 days, AND result in revenue generation: 1) 10% of actual revenue AND 2) any direct damages associated with the delay.	Monthly
8	MVD	The volume provided by Traffic Detection Systems (MVD) shall be 95.00% accurate.	95.00%	$200 per MVD, per each 0.1% below threshold	Annual performance audit, to be executed by Kapsch, for a minimum of 5 minutes and minimum vehicle count of 30, per MVD, as determined by audit confidence as a threshold.
9	Non-EL Transaction Processing	100% of all Non-EL transactions shall be transmitted to the CTRMA Data Platform System (DPS) within three (3) calendar days of the transaction date.	100%	For lost or uncollectable transactions: 1) Actual revenue above $5,000 AND 2) any direct damages associated with the loss. For transactions transmitted >3 days and <=30 days, AND result in revenue generation: 1) 10% of actual revenue AND 2) any direct damages associated with the delay.	Monthly

10	IR	For transactions requiring a manual review process, 99.50% shall be completed, AND returned, within 72 hours from the time the image review request was received.	99.50%	For Image Reviews completed >72 hours and <= 10 days: 1) $200 per each 0.1% below threshold. For Image Reviews completed >10 days and <= 30 days, AND result in revenue generation: 1) 10% of actual revenue AND 2) any direct damages associated with the delay. For lost or uncollectable Image Review transactions: 1) Actual revenue above $5,000 AND 2) any direct damages associated with the loss	Monthly
11	Reports	1. Monthly Maintenance Report, accurately detailing system performance relative to all Project KPIs, shall be submitted to CTRMA each month. 2. Monthly Inventory Report, to be exported directly from MOMs, accurately detailing the location, count, and serial numbers of all the CTRMA hardware, including retired hardware (if applicable), spares and Return Material Authorization (RMA) hardware for the previous calendar month. 3. Contractor to provide complete reports, cover page, table of contents, and summaries, format to be agreed upon by Contractor and CTRMA.	By the 15th of the following month	Cannot invoice for monthly maintenance without submitting these reports.	Monthly
12	Availability	Each ETC lane shall be available 99.50% of the time. An available lane is defined as a lane with the ability to collect revenue either through image capture or tag read and	99.50%	N/A - KPI #7 (Trip Processing) and KPI #9 (Non-EL Transaction Processing) covers the maximum liquidated damages for this section.	Monthly

		association.			
13	Availability	The Host Level system shall be available 99.50% of the time. An available host is defined as a fully operating host such that Reports, ROMS, and transaction processing are online (with the exception of approved downtime for maintenance purposes).	99.50%	$200 per each 0.1% below threshold	Monthly
14	Availability	Express Lanes CCTV shall be available 99.50% of the time, excluding scheduled maintenance.	Express: 99.50%	$200 per each 0.5% below threshold	Monthly
15	Availability	Non-Express CCTV shall be available 95.00% of the time, excluding scheduled maintenance.	Non-Express: 95.00%	$200 per each 0.5% below threshold	Monthly
16	Availability	DMS shall be available 95.00% of the time, excluding scheduled maintenance.	95.00%	$200 per each 0.5% below threshold	Monthly
17	Availability	Express MVDs shall be available 99.50% of the time per segment, excluding scheduled maintenance.	Express: 99.50%	Express: $100 per each 0.5% below threshold per segment.	Monthly
18	Availability	MVDs shall be available 95.00% of the time per device, excluding scheduled maintenance.	Non-express: 95.00%	Non-Express: $100 per each 0.5% below threshold per device.	Monthly
19	VTMS Availability	The VTMS System will be available as outlined below, excluding scheduled maintenance. Availability of 99.95%, with a 15 minute grace period for emergency maintenance.	99.95%, 15 min. grace excluded	Actual revenue above $5,000 (calculated using liquidation rate).	Monthly
20	VTMS Accuracy	The System will post and maintain the correct toll rate to the VTMS 99.90% of the time per VTMS under all conditions within the Design specification described in the requirements.	99.90%	$200 per each 0.5% below threshold	Monthly

21	Time to Respond – Priority 1	All priority 1 tickets must be acknowledged within 1 hour of ticket creation. A Priority 1 Maintenance Event is defined as any malfunction or fault that will result in the immediate loss of revenue and/or hazard to personnel.	N/A	$100 per each event > 1 hour	Monthly
22	Time to Repair - Priority 1	All priority 1 tickets must be repaired within 4 hours of ticket acknowledgement.	N/A	$200 per each event > 4 hour	Monthly
23	Time to Respond – Priority 2	All priority 2 tickets must be acknowledged within 1 hour of ticket creation. Priority 2 Maintenance Event is defined as any malfunction or fault that will not result in immediate loss of revenue but will/may impact operational performance.	N/A	$75 per each event > 1 hour	Monthly
24	Time to Repair - Priority 2	All priority 2 tickets must be repaired within 12 hours of ticket acknowledgement.	N/A	$150 per each event > 12 hour	Monthly
25	Time to Respond – Priority 3	All priority 3 tickets must be acknowledged within 1 hour of ticket creation. A Priority 3 Maintenance Event is defined as any action or event reported that will/may impact operational performance, has potential of degrading the System performance, and has no impact to revenue collection.	N/A	$25 per each event > 1 hour	Monthly
26	Time to Repair - Priority 3	All priority 3 tickets must be repaired within 36 hours of ticket acknowledgement.	N/A	$50 per each event > 36 hour	Monthly
27	Inventory	All CTRMA hardware, to include those currently installed, maintained as spares, and Return Material Authorization (RMA) (if applicable), shall be included in an Annual Physical Inventory Audit Program, as agreed upon by the contractor and CTRMA.	Due yearly with February MMR	Cannot invoice for monthly maintenance without submitting Inventory Audit.	Annually

M13.0 Confidentiality

The Contractor shall keep all information regarding its activities pursuant to this Contract confidential and will communicate such information only with authorized CTRMA personnel or CTRMA designated representatives.

[END OF SECTION]

SCHEDULE 1.5

MAINTENANCE SERVICES CONTRACT
FOR TOLL COLLECTION SYSTEM

PRICE SCHEDULE

This section provides descriptions of the Method of Measurement and the Basis of Payment to complete the work for maintenance services on the toll collection systems on the CTRMA's Toll Road System.

1. Hourly Rates

The Hourly Rates proposed for Amendment No. 6 proposed are FY 2022 Fully Loaded Rates.

Item Description / Position Title	FY 2019	FY 2020	FY 2021	FY 2022
	2.00%	N/A	3.00%	9.10%
Software Engineer	$ 157.59	$ 157.59	$162.32	**$182.40**
System / Hardware Engineer	$ 172.52	$ 172.52	$177.70	**$199.69**
Technician	$ 120.90	$ 120.90	$124.53	**$139.94**
Database Administrator	$ 224.14	$ 224.14	$230.86	**$259.42**
Documentation Clerk	$ 161.66	$ 161.66	$166.51	**$187.11**
Testing Engineer	$ 171.17	$ 171.17	$176.31	**$198.12**
Project Manager	$ 224.14	$ 224.14	$230.86	**$259.42**
Network Administrator	$ 156.22	$ 156.22	$160.91	**$180.82**
Business Analyst	$ 157.59	$ 157.59	$162.32	**$182.40**

2. Amendment No. 6 Maintenance Contract Pricing

A. Monthly Maintenance Services for 183A Toll Phases I & II, 290 Toll Phase I - III, 71 Toll, MoPac Express Lane, 45 SW Toll, 183 South Toll Phases I - II

The monthly fee for maintaining 183A Toll, 290 Toll, 71 Toll, MoPac Express Lane, 45 SW Toll and 183 South Toll projects, including Plaza System, Host System, Communications Equipment, all ETC Toll Lanes, System Administration, and the complete Intelligent Transportation Systems (ITS) as furnished and installed shall be measured on a per month basis. Each per month unit shall include furnishing all labor, materials, and support services to perform Maintenance Services for that month in conformance with the requirements of the Specifications, the specified requirements of the ITS equipment, and as accepted by the CTRMA.

Amendment No. 5 Maintenance Contract Pricing	Monthly	Annual
183-A, 290-E, TX-71, Mopac Express Lanes, 45SW and 183S	$474,623.17	$5,695,478.04

Amendment No. 6 Maintenance Contract Pricing	Monthly	Annual
183-A, 290-E, SH-71, Mopac Express Lanes, 45SW, 183S and additional ITS	$486,726.51	$5,840,718.12

Monthly Support for Maintenance of 183-A, 290-E, TX-71, Mopac Express Lanes, 45SW, 183S and additional ITS	
Software Engineers	4 FTEs
Systems Administration	2 FTEs
Business Analyst	1 FTE
Maintenance Technicians	7 FTEs
TOTAL	14 FTEs

B. TMC Operations Support

Amendment No. 6 adjusts pricing for the TIM Center Operations to facilitate adding or removing staff as CTRMA expands. CTRMA anticipates the use of four (4) operators in fiscal year 2022. The monthly pricing per FTE is $9,782.48.

TMC Operations Support				
Description	Unit (hrs.)	2022 CPI Adjusted Rate	TMC Operation	
			Qty	Per Month
Operations Support	173	$56.55	4	$39,129.90

3. Out of Scope Services

The hourly rates for out of scope services pursuant to Section 11 of the Toll Collection System Maintenance Services Contract are reflected in the FY 22 fully loaded rates, outlined in Section 1.

4. Other Direct Costs

Other Direct Costs (ODCs) are the reasonable actual direct incremental costs incurred by the Contractor for the performance of the applicable Work that are directly attributable to such Work. ODCS may include leasing, fuel, repairs, tolls, etc. associated with maintenance vehicle costs. ODCs also cover consumables maintenance technicians may use in performing their duties.

Role	FY 2019	FY 2020	FY 2021	FY 2022
	2.00%	N/A	3.00%	9.10%
Technicians ODCs	$2,169.31	$2,169.31	$2,234.39	$2,437.72

5. ITS Maintenance

A. Cost Breakdown

Amendment No. 6 adjusts pricing for all furnished and installed ITS equipment to facilitate adding or subtracting of said equipment over the course of this Maintenance Services Contract. Costs per device are on a per month basis and included in Amendment No. 6 Maintenance Contract Pricing as outlined in Section 2.

ITS Cost per Device	FY 2019	FY 2020	FY 2021	FY 2022
	N/A	*N/A*	*N/A*	*9.10%*
CCTV	$112.00	$112.00	$112.00	$122.19
DMS	$133.00	$133.00	$133.00	$145.10
VTMS	$140.00	$140.00	$140.00	$152.74
MVDs	$108.00	$108.00	$108.00	$117.83

B. ITS Bill of Quantities

ITS Project	CCTV	VTMS	DMS	MVDs
290-E	13	0	2	34
MoPac	30	5	0	58
SH71	1	0	0	0
45SW	10	0	2	11
183S	14	0	5	29
183A	42	0	2	11
Total	**110**	**5**	**11**	**143**

6. Toll System Maintenance

Amendment No. 6 adjusts the pricing of monthly fees for maintaining 183A Toll, 290 Toll, 71 Toll, MoPac Express Lane, 45 SW Toll and 183 South Toll projects. The pricing, displayed below as a per lane fee, includes all required systems to support transaction capture, transaction creation and transaction transmission. These systems include the Plaza System, Host System, Communications Equipment, ETC Toll Lanes and System Administration. Maintenance fee cost breakdown is to facilitate the adding or subtracting of ETC Toll Lanes over the course of this Maintenance Services Contract.

Toll Project	Lanes	Fee per Lane	Toll System Maintenance	ITS Maintenance	Toll Project Maintenance	
					Monthly	Annually
290-E	43	$2,097.54	$90,194.22	$5,884.89	$96,079.11	$1,152,949.32
MoPac	7	$8,166.85	$57,167.95	$11,263.54	$68,431.49	$821,177.88
SH71	6	$1,633.37	$9,800.22	$122.19	$9,922.41	$119,068.92
45SW	6	$2,450.06	$14,700.36	$2,808.23	$17,508.59	$210,103.08
183S	37	$4,083.41	$151,086.17	$5,853.23	$156,939.40	$1,883,272.80
183A	40	$3,278.18	$131,127.20	$6,718.31	$137,845.51	$1,654,146.12
Total	**139**		**$454,076.36**	**$32,650.39**	**$486,726.51**	**$5,840,718.12**

Authorize agreements with the
Travis County Sheriff's Office
for habitual violator road
enforcement services

CENTRAL TEXAS REGIONAL
MOBILITY AUTHORITY

Strategic Plan Relevance:	Deliver Responsible Mobility Solutions that Respect the Communities We Serve; Deliver of Commitments to Our Customers and Our Investors; Employ a Collaborative Approach to Implementing Mobility Solutions
Department:	Operations Department
Contact:	Tracie Brown, Director of Operations
Associated Costs:	not to exceed $300,000
Funding Source:	FY 23 Operating Budget
Action Requested:	Consider and act on draft resolution

Project Description/Background: The vast majority of Mobility Authority customers pay for their toll usage in a timely manner, either by electronic toll tag or through our courtesy Pay By Mail program. Non-payers undermine the ability of the Mobility Authority to pay back its bonds and finance future projects. It also presents an unfair burden to the paying customers.

Chapter 372 of the Texas Transportation Code provides enforcement tools for egregious toll violators. This statute authorizes additional remedies for "habitual violators," those who have accumulated 100 or more unpaid tolls in aggregate in a 12- month period and have been issued two notices of nonpayment that continue to go unpaid. The remedies include publication of the toll scofflaw's name, a vehicle registration block and a ban of the vehicle's use of the entity's toll facilities. In addition, traffic citations and vehicle impoundment are possible for those who violate the vehicle prohibition.

Previous Actions & Brief History of the Program/Project: In July 2019 the Mobility Authority's Board of Directors authorized the Executive Director to negotiate agreements with Travis and Williamson Counties for habitual violator enforcement services. The Williamson County Commissioner's Court approved a standard

agreement for off-duty contracting of county constable deputies in December 2019 which sets an $8 hourly rate for vehicle use and deputies be paid by the Mobility Authority directly as independent contractors.

Active on-road enforcement with those deputies began in February 2020. Enforcement was briefly halted in March 2020 for a 3-month period as the Deputies were required to focus on COVID-related matters for the county. Enforcement resumed in June 2020. The election of a new Constable in Precinct #1 necessitated the execution of a new ILA with Williamson County in December 2020 to continue these services.

In August 2021 the Board authorize the Executive Director to enter into an off-duty agreement with the Travis County Sheriff's Office to provide on-road enforcement services. These services support the Authority's habitual violator program and allow the detainment of vehicles that have been expressly prohibited by the Board from utilizing the Authority's toll facilities as a result of their unpaid toll obligations.

Because procurement of road enforcement services does not precisely align with normal acquisition of good and services, a change to the Mobility Authority's *Policy Code* was also approved to add these services to the list of items allowed under discretionary exemptions.

Financing: Operating Fund

Action requested: Through an off-duty agreement with the Travis County Sheriff's Office, the Authority will contract for marked law enforcement vehicles, uniformed law enforcement officers, and all vehicular equipment necessary to identify offenders and enforce Texas Transportation Code Section 372 violation of an order prohibiting the operation of motor vehicles on CTRMA-operated toll facilities within Travis County or adjacent counties as permitted when the following criteria are met:

    i.   the registered owner of the vehicle has been finally determined to be a habitual violator; and

    ii.   the toll project entity has provided notice of the prohibition order to the registered owner.

Specific operations include active law enforcement, identifying and stopping certain vehicles via the use of license plate information provided by CTRMA, issuing a citation for violation of a prohibition order, issuing verbal and written notification to the violator of possible action to be taken if violator continues to use the facility, and directing the impoundment of the prohibited vehicle under the appropriate circumstances. Additional active law enforcement may include arrests, perpetrator transportation, impounding of vehicles, etc. The supervising officer will be required to provide written monthly reports noting the enforcement hours and a summary of the violations issued during the targeted enforcement period.

The hourly rate or "donation" for these services are prescribed by Travis County's standard *Application for Secondary Employment of Law Enforcement*. Staff recommends a $76 hourly rate for officers. A separate "donation" of $20 per hour is required for the use of Travis County-owned vehicles. The combined Travis County rates are in line with that paid to Williamson County and its deputies for the same service.

The term of the proposed agreement will begin after full execution and terminate on December 31, 2022 at which point TCSO requires execution of a new agreement. The Agreement may be terminated by mutual written agreement, or after either party gives notice to the other party, whichever occurs first.

Staff Recommendation: Staff recommends authorizing agreements with the Travis County Sheriff's Office for habitual violator road enforcement services.

Backup provided: Draft Resolution
TCSO Application for Secondary Employment of Law Enforcement
TCSO Vehicle Agreement
TCSO Liability Agreement

**GENERAL MEETING OF THE BOARD OF DIRECTORS
OF THE
CENTRAL TEXAS REGIONAL MOBILITY AUTHORITY**

RESOLUTION NO. 22-0XX

**AUTHORIZING AGREEMENTS WITH THE TRAVIS COUNTY SHERIFF'S OFFICE
FOR HABITUAL VIOLATOR ROAD ENFORCEMENT SERVICES**

WHEREAS, the Central Texas Regional Mobility Authority (Mobility Authority) requires law enforcement services to enforce the Habitual Violator Program; and

WHEREAS, local law enforcement agencies have programs to allow third-parties to request off-duty services such as toll road enforcement but do not regularly respond to solicitations for these types of services; and

WHEREAS, the Travis County Sheriff's Office has indicated it is interested and willing to provide law enforcement services to the Mobility Authority through its off-duty program; and

WHEREAS, pursuant to Section 401.0061 of the Mobility Authority Policy Code, law enforcement services are exempted from competitive procurement requirements; and

WHEREAS, the Executive Director recommends and requests that he be authorized to take all actions necessary to enter into agreements with the Travis County Sheriff's Office for toll road enforcement services up to a cumulative amount not to exceed $300,000 through their off-duty employment program.

NOW THEREFORE, BE IT RESOLVED that the Board of Directors hereby authorizes and directs the Executive Director to take all actions necessary to enter into agreements with the Travis County Sheriff's Office for toll road enforcement services up to a cumulative amount not to exceed $300,000 through their off-duty employment program in support of the Habitual Violator Program.

Adopted by the Board of Directors of the Central Texas Regional Mobility Authority on the 29th day of June 2022.

Submitted and reviewed by: Approved:

_____   _____
James M. Bass   Robert W. Jenkins, Jr.
Executive Director   Chairman, Board of Directors

CENTRAL TEXAS REGIONAL MOBILITY AUTHORITY

Strategic Plan Relevance:	Regional Mobility
Department:	Executive
Contact:	James M. Bass, Executive Director
Associated Costs:	N/A
Funding Source:	N/A
Action Requested:	Briefing and Board Discussion Only

Project Description/Background:

Executive Director Report.

     A. Agency performance metrics.

          (i)   Roadway performance
          (ii)   Call-Center performance

Backup provided: None

CENTRAL TEXAS REGIONAL
MOBILITY AUTHORITY

Executive Session:

Discuss legal issues related to claims by or against the Mobility Authority; pending or contemplated litigation and any related settlement offers; or other matters as authorized by §551.071 (Consultation with Attorney).

Executive Session:

Discuss legal issues relating to procurement and financing of Mobility Authority transportation projects and toll system improvements, as authorized by §551.071 (Consultation with Attorney).

Executive Session:

Discuss personnel matters as authorized by §551.074 (Personnel Matters).

Adjourn Board Meeting.