

# REQUEST FOR PROPOSALS (RFP)

Roadside System Implementation and Maintenance

January 14, 2020

Submit Response To:

Attn: Ron Fagan, Toll Operations  
North East Texas Regional Mobility Authority  
1001 ESE Loop 323, Ste. 420  
Tyler, Texas 75701

All spaces below are to be filled in and this sheet must be incorporated within as the first page of the response to this Request for Proposals (RFP).

Firm Name: \_\_\_\_\_  
Contact Name: \_\_\_\_\_  
Address: \_\_\_\_\_  
Telephone: \_\_\_\_\_ Facsimile: \_\_\_\_\_  
Email: \_\_\_\_\_

By my signature below, I certify that I am authorized to sign this proposal for the firm named above. I further certify that this proposal is made without prior understanding, agreement, or connection with any other company or person submitting a separate proposal for the same services and is in all respects fair and without collusion or fraud. This proposal shall remain open for acceptance for 150 days from the Proposal Due Date. On behalf of the firm named above, I further certify that such firm has and will abide by all conditions set forth in this RFP.

Signature \_\_\_\_\_  
Name and Title \_\_\_\_\_  
Date \_\_\_\_\_

Refer ALL Inquiries to: Ron Fagan, Toll Operations  
[rfagan@faganconsulting.com](mailto:rfagan@faganconsulting.com)  
Only email inquiries accepted



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## LIST OF ACRONYMS

AET	All Electronic Tolling
ALPR	Automatic License Plate Recognition
AVC	Automatic Vehicle Classification
AVD	Automatic Vehicle Detection
AVI	Automatic Vehicle Identification
BAFO	Best and Final Offer
BOM	Bill of Materials
COTS	Commercial Off-The-Shelf
CSV	Comma Separated Values
CTRMA	Central Texas Regional Mobility Authority
CUSIOP	Central U.S. IOP Hub
DBMS	Database Management System
DR	Disaster Recovery
DRP	Disaster Recovery Plan
DVAS	Digital Video Audit System
EIA	Electronic Industries Alliance
ETC	Electronic Toll Collection
ETCS	Electronic Toll Collection System
FAT	Factory Acceptance Test
FCC	Federal Communication Commission
GUI	Graphical User Interface
ICD	Interface Control Document
IEEE	Institute of Electrical and Electronics Engineers
IOP	Interoperability (IBTTA committee)
ISO	International Organization for Standardization
ISSL	Initial Spare Stock Listing
LAN	Local Area Network



LPL	License Plate Validation List
LPN	License Plate Number
MMR	Monthly Maintenance Report
MOMS	Maintenance Online Management System
MOT	Maintenance of Traffic
MTBF	Mean Time Between Failures
MTTRR	Mean Time to Respond and Repair
MUTCD	Manual of Uniform Traffic Control Devices
NEC	National Electrical Code ®
NET RMA	North East Texas Regional Mobility Authority
NTP	Notice to Proceed
OCR	Optical Character Recognition
ORT	Open Road Tolling
PBM	Pay By Mail
PDF	Portable Document Format
PIA	Texas Public Information Act
PMP	Project Management Plan
QA/QC	Quality Assurance/ Quality Control
RFID	Radio Frequency Identification
RFP	Request for Proposals
RTM	Requirements Traceability Matrix
SAT	System Acceptance Test
SDDD	System Detailed Design Document
SLA	Service Level Agreement
SLD	Straight Line Diagram
SRD	System Requirements Document
TFH	Toll Facility Host
TIA	Telecommunications Infrastructure Standard for Data Centers
TSI	Toll Systems Integrator



TVL	Transponder (Tag) Validation List
UPS	Uninterruptable Power Supply
USB	Universal Serial Bus
VES	Video Enforcement System
WAN	Wide Area Network
WBS	Work Breakdown Structure
WSDL	Web Services Description Language



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## 1 INTRODUCTION

The North East Texas Regional Mobility Authority (NET RMA), is a regional mobility authority and political subdivision of the State of Texas governed by the provisions of Texas Transportation Code, Chapter 370. The NET RMA's mission is to implement transportation solutions that will enhance the quality of life and economic development and promote efficient mobility in the North East Texas region. The NET RMA was established as a regional mobility authority in Texas on October 28, 2004 by the Texas Transportation Commission. The NET RMA is governed by a 21-member board of directors that represent each of its 14 member counties: Bowie, Camp, Cass, , Kaufman, Cherokee, Gregg, Harrison, Panola, Rusk, Smith, Titus, Upshur, Wood and Van Zandt.

### 1.1 TOLL 49 FACILITY

The NET RMA is responsible for the operation and maintenance of Toll 49, a tolled facility located in Smith County. Customers may travel on Toll 49 and make payment via a transponder (TxDOT's TxTAG, NTTA's TollTag, HCTRA's EZ TAG, Kansas Turnpike Authority's K-Tag, Oklahoma Turnpike Authority's Pikepass) or via Pay By Mail (PBM, license plate image toll or iToll). Collectively, the roadway has five (5) bi-directional mainline toll gantries and eight (8) ramp gantries shown in Figure 1 below. The tollway travels from SH 110 southeast of Tyler, west and north to US 69 northwest of Lindale. The tollway development occurred in six segments as described below and illustrated in Figure 1: Current Toll 49 System Map, Segments 1-5 and Figure 2: Proposed Toll 49 System Map, Segment 6.

- Segment 1: Extends from SH 155 easterly to US 69, approximately 5.0 miles. Construction on this segment completed in August 2006, and it opened to traffic as a Toll Road in November 2006.
- Segment 2: Extends from US 69 easterly to FM 756 (Paluxy Road), approximately 2.0 miles. Construction on this segment completed in late 2007. The roadway opened to traffic in January 2008, and tolling initiated in March 2008.
- Segment 3A: Extends from SH 155 northwesterly to SH 31, approximately 6.6 miles. Construction on this segment completed and opened to traffic as a Toll Road on November 9, 2012.
- Segment 3B: Extends from SH 31 north to I-20, approximately 10.2 miles. Segment 3B opening to traffic as a Toll Road on March 28, 2013.
- Segment 4: Extends from I-20 north to US 69 above Lindale. Segment 4 opened to traffic as a Toll Road in November 2018.
- Segment 5: Extends from FM 756 to SH 110 near Whitehouse, approximately 2.5 miles. Segment 5 opened to traffic in June of 2012.
- Segment 6: The NET RMA is currently pursuing the development of Segment 6 Toll 49. Segment 6 will extend from the Toll 49 Segment 5 eastern terminus at SH 110 near the City of

Whitehouse to US 271 east of the City of Tyler, Smith County, Texas for a distance of approximately 13.5 miles in length. Segment 6 is expected to be tolled. An Environmental Impact Statement for Segment 6 is expected to be completed in 2022.

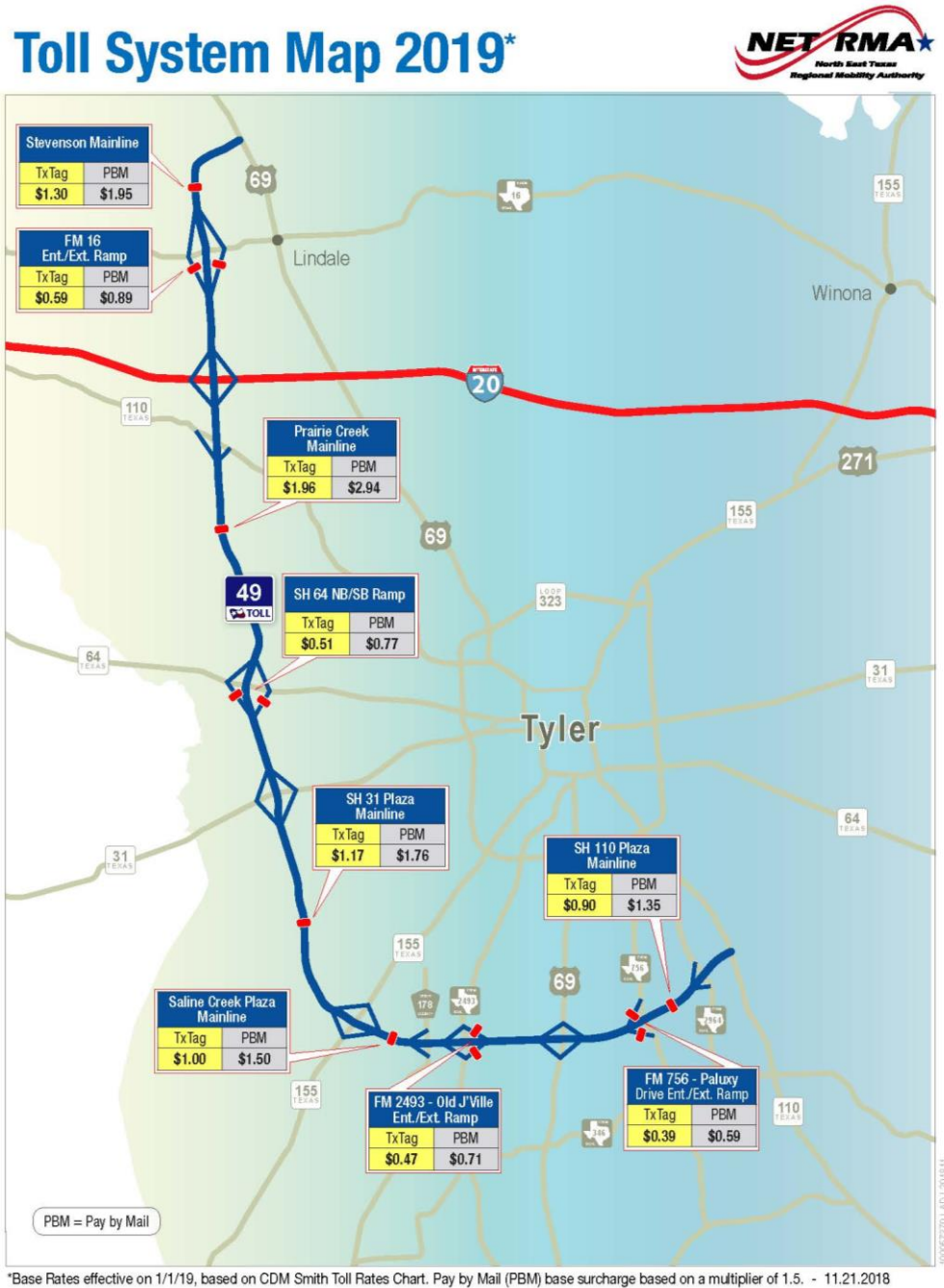


Figure 1: Current Toll System Map, Segments 1-5



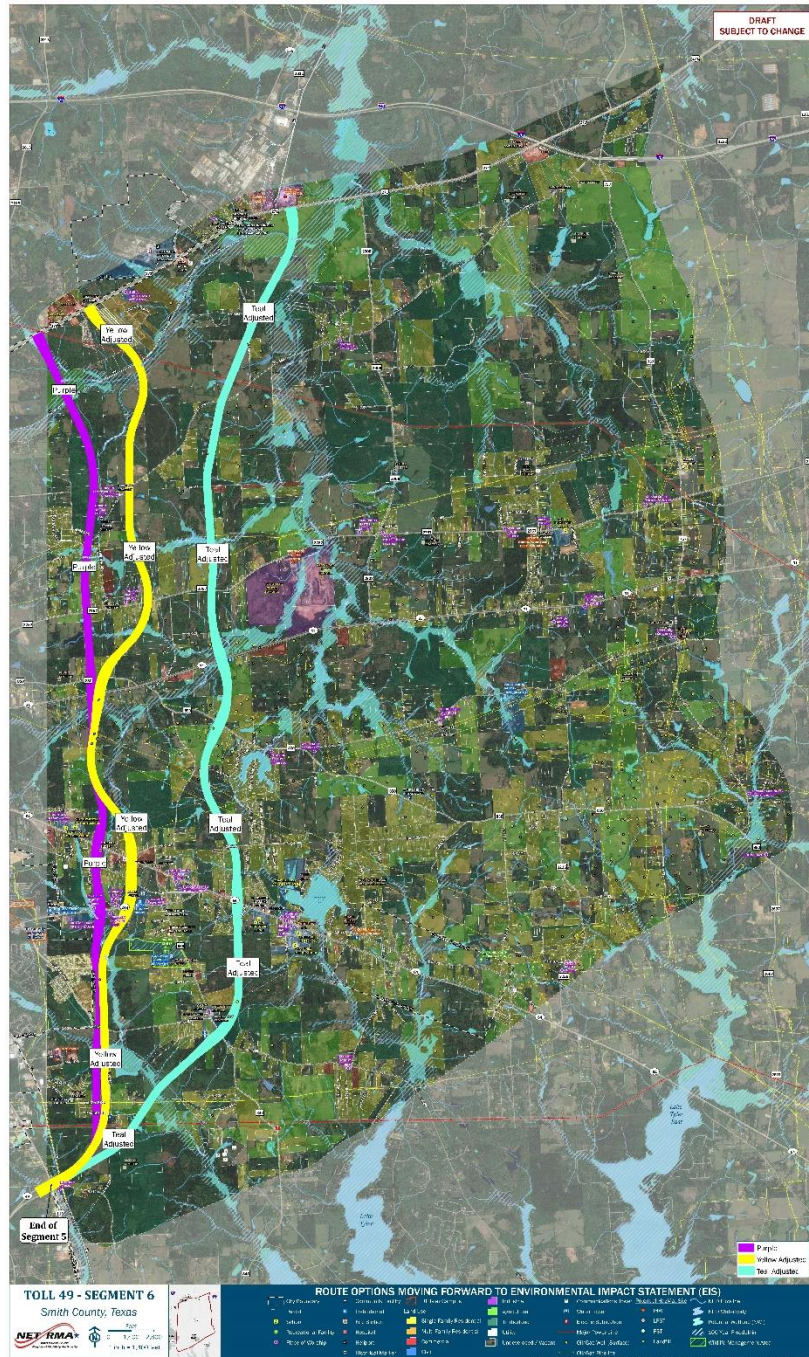
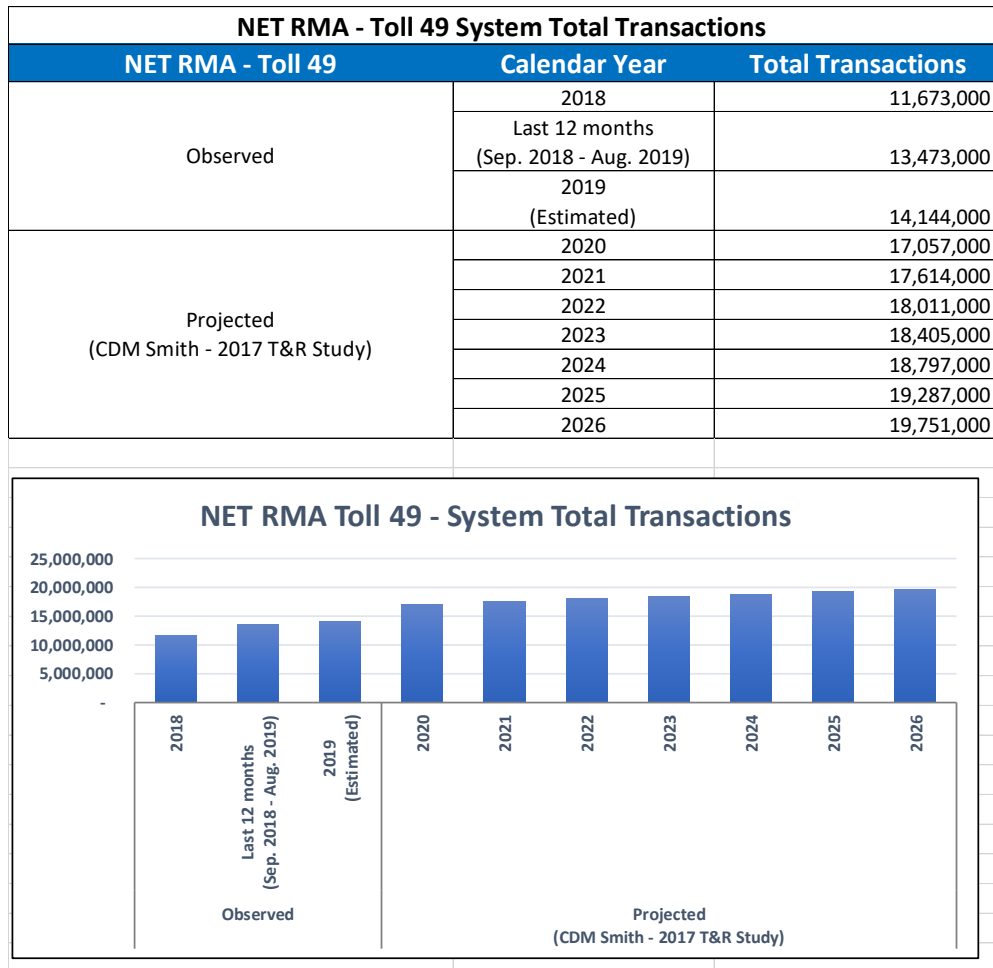


Figure 2: Proposed Toll 49 System Map, Segment 6

## 1.2 TOLL 49 SYSTEM TRANSACTIONS

The Toll 49 total transactions and forecasted transactions are shown in Figure 3: Toll 49 System Transactions below.

*Figure 3: Toll 49 System Transactions*

### 1.3 PURPOSE OF PROCUREMENT

NET RMA is seeking qualified Contractors interested in serving as the Toll Systems Integrator (TSI) to maintain, and possibly design and implement new portions of the NET RMA's Electronic Toll Collection System (ETCS) for Toll 49, with consideration for reusing as much of the existing tolling equipment as is possible. The services will include roadside system and a Toll Facility Host (TFH) design, development, installation, integration, provisioning, testing, training, commissioning, and maintenance. There are no operations or staffing component to this procurement, the NET RMA will operate these facilities with existing staff.



## 1.4 SUMMARY OF PROCUREMENT

The selected TSI will be responsible for maintenance of the ETCS and, if applicable, the design and implementation of new portions of the ETCS that will perform all functions typical of an all-electronic tolling system, including at a minimum, the following functions:

- Roadside equipment
- Toll Facility Host System
- AVI and image-based transaction processing
- High availability TFH
- Network installation, configuration, and maintenance
- Maintenance Online Management System

A significant portion of the existing ETCS is available for reuse with the delivery of the Scope of Work in this RFP. See Section 3 Scope of Work for details.

## 1.5 SCHEDULE OF EVENTS

The schedule of events set out herein represents the best estimate of the schedule that NET RMA will follow. Any changes to the schedule will be posted to the NET RMA website prior to the closing date of this RFP.

*Table 1: Schedule of Events*

Event	Date
Date of Issuance	January 14, 2020
Mandatory Site Visit	February 4, 2020 or February 5, 2020
Question Period Begins	From January 14, 2020 through to February 14, 2020
Question Period Ends	February 14, 2020
Last Day Answers Posted to NET RMA's Website	February 21, 2020
Proposals Due/Close Date and Time	March 12, 2020, 3:00 pm CST
Oral Presentation	April 7, 2020
Recommendation to Award and Final Contract Posted (on or about)	April 14, 2020
Negotiations and Final Contract Posted (on or about)	May 14, 2020
Notice to Proceed (on or about)	May 18, 2020



## 1.6 ISSUING OFFICER

Ron Fagan, Toll Operations  
[rfagan@faganconsulting.com](mailto:rfagan@faganconsulting.com)  
[512.517.8053](tel:512.517.8053)

## 1.7 CONTRACT TERM

The NET RMA anticipates entering into an agreement with the TSI for an initial term of five (5) years and an option to renew for up to two (2) additional two (2) year periods.

## 1.8 PERFORMANCE BOND

The successful proposer shall be required to provide a performance bond equal to 100% of the contract price. All proposers must submit a letter from a surety licensed to do business in the State of Texas indicating that if the proposer is successful, the surety would provide a bond in the required amount. The surety shall not include the value of the prospective bond in the letter in order to preserve the integrity of the cost evaluation process of this RFP.

A de-escalating Performance Bond is acceptable to NET RMA as the TSI successfully progresses through the Project Phases.

# 2 GENERAL INFORMATION AND INSTRUCTIONS

By submitting a response to the RFP, the Proposer is acknowledging that the Proposer:

- 1) Has read the entirety of the information and instructions
- 2) Agrees to comply with the information and instructions contained herein

## 2.1 RESTRICTIONS ON COMMUNICATIONS WITH STAFF

Proposers shall not communicate with any NET RMA staff or NET RMA representatives/consultants about this procurement except through the Issuing Officer named herein, during the mandatory site visit, for questions concerning this RFP which may be submitted pursuant to Section 2.2 Questions, Clarifications and Recommendations, or as otherwise set forth in this RFP. Prohibited communication includes all contact or interaction, including but not limited to telephonic communications, emails, faxes, letters, or personal meetings, such as lunch, entertainment, or otherwise. The NET RMA reserves the right to reject the proposal of any Proposer violating this provision.



## 2.2 QUESTIONS, CLARIFICATIONS AND RECOMMENDATIONS

No questions other than written will be accepted. All Proposers must submit questions by the deadline identified in the Section 1.5 Schedule of Events for submitting questions. All questions about this RFP must be submitted using the Question and Answer form included in Appendix I - Proposal Forms to this RFP.

Responses to questions posed may be posted on the NET RMA website. Interested parties are responsible for monitoring the NET RMA website for information, updates, or announcements regarding this RFP.

Key terms to be included in the final Contract that NET RMA expects to award as a result of this RFP are included as APPENDIX B Contract to this RFP. Therefore, all costs associated with complying with the requirements of such terms should be included in any pricing quoted by the Proposers. Proposers must submit any and all questions, clarifications and recommendations regarding the terms and conditions to the Issuing Officer by the deadline for submitting written questions as defined in Section 1.5 Schedule of Events. Questions should be submitted using the Questions and Answers form provided in Appendix I - Proposal Forms. While questions, clarifications and recommendations are encouraged, any exceptions to NET RMA's Terms and Conditions shown in Appendix B must be so indicated as an exception in the proposal, and only those exceptions will be considered for negotiation. At NET RMA's discretion, certain exceptions may result in a proposal being disqualified from further review and evaluation.

The final Contract, containing any acceptable and agreed upon requests will be posted by the deadline specified in Section 1.5 Schedule of Events. All requests will be taken into consideration by NET RMA; however, the final Contract that is posted will contain the final Contract terms and conditions that are acceptable to NET RMA.

## 2.3 MANDATORY SITE VISIT

The NET RMA will provide the Proposers with information relevant to the existing facilities and upcoming projects. This will include a site visit to the existing Toll 49 roadside facilities.

The dates for the Mandatory Site Visit are identified in the Section 1.5 Schedule of Events. NET RMA offers proposers to select one of the two dates for a one-day site visit. Proposers shall submit a written request for attendance to the Issuing Officer no less than two (2) days prior to the scheduled visit. The request should indicate the names and titles of attendees.

## 2.4 NET RMA'S RIGHT TO REQUEST ADDITIONAL INFORMATION – CONTRACTOR RESPONSIBILITY

Prior to award, NET RMA must be assured that the selected Contractor has all the resources to successfully perform under the Contract. This includes, but is not limited to, adequate number of personnel with required skills, availability of appropriate equipment in adequate quantity to meet the

on-going needs of NET RMA, financial resources to complete performance under the Contract, and relevant experience in similar endeavors. If such information is requested, the Contractor will be so notified and will submit the information requested within the time requested by NET RMA.

## 2.5 FAILING TO COMPLY WITH SUBMISSION INSTRUCTIONS

Proposals received after the identified due date and time or submitted by any other means than those expressly permitted by the RFP will not be considered. Proposers' responses must be complete in all respects, as required in each section of this RFP, or the Proposer's response/proposal may not be considered.

## 2.6 REJECTION OF PROPOSALS; NET RMA'S RIGHT TO WAIVE IMMATERIAL DEVIATION

NET RMA reserves the right to reject any or all responses, to waive any irregularity or informality in a Proposer's Proposal, and to accept or reject any item or combination of items. It is also within the right of NET RMA to reject responses that do not contain all elements and information requested in this RFP. A Proposer's response will be rejected if the response contains any defect or irregularity and such defect or irregularity constitutes a material deviation from the RFP requirements, which determination will be made by NET RMA on a case-by-case basis.

## 2.7 NET RMA'S RIGHT TO AMEND AND/OR CANCEL THIS RFP

NET RMA reserves the right to amend this RFP prior to the Proposal Due Date and time. As necessary, an Addendum to the RFP will be made in writing and communicated to the Proposers.

*EACH PROPOSER IS INDIVIDUALLY RESPONSIBLE FOR REVIEWING ADDENDA AND ANY OTHER POSTED DOCUMENTS AND MAKING ANY NECESSARY OR APPROPRIATE CHANGES AND/OR ADDITIONS TO THE PROPOSER'S RESPONSE.*

Proposers shall acknowledge receipt and understanding of each Addendum in the format provided in APPENDIX I Proposal Forms.

Finally, NET RMA reserves the right to cancel this RFP at any time.

## 2.8 PROTEST PROCEDURES

This Section sets forth the exclusive protest remedies available to the Proposers with respect to this RFP. Each Proposer, by submitting its Proposal, expressly recognizes the limitation on its rights to protest contained herein, expressly waives all other rights and remedies and agrees that the decision on any protest, as provided herein, shall be final and conclusive and not subject to legal challenge unless wholly arbitrary. These provisions are included in this RFP expressly in consideration for such waiver and agreement by Proposers. Such waiver and agreement by each Proposer are also consideration to the other Proposers for making the same waiver and agreement.



### 2.8.1 PROTESTS REGARDING RFP DOCUMENTS

Proposer may protest the terms of the RFP prior to the time for submission of Proposals on the grounds that (a) a material provision in the RFP is ambiguous, (b) any aspect of the procurement process described herein is contrary to legal requirements applicable to this procurement, or (c) the RFP in whole or in part exceeds the authority of the NET RMA. Protests regarding the RFP shall be filed only after Proposer has informally discussed the nature and basis of the protest with the NET RMA RFP Contact to attempt to remove the grounds for protest.

Protests regarding the RFP shall completely and succinctly state the grounds for protest and shall include all factual and legal documentation in enough detail to establish the merits of the protest. Evidentiary statements, if any, shall be submitted under penalty of perjury.

Protests regarding the RFP shall be filed as soon as the basis for protest is known to Proposer, but in any event, it must be received no later than ten (10) days before the Proposal Due Date, provided that protests regarding an addendum to the RFP shall be filed and actually received no later than five (5) days after the addendum to the RFP is issued (or no later than the Proposal Due Date, if earlier).

Protests regarding the RFP shall be filed in writing by hand delivery or courier to:

North East Texas Regional Mobility Authority  
1001 ESE Loop 323, Ste. 420  
Tyler, TX 75701

with a copy to the NET RMA's Executive Director.

The NET RMA and the other Proposers may file by hand delivery or courier to the NET RMA RFP Contact, with a copy to the protesting Proposer, a statement in support of or in opposition to the protest. Other Proposers shall also deliver a copy of their statement to the NET RMA Executive Director. Such statements must be filed within seven (7) days after the protesting Proposer files a protest.

The protesting Proposer shall have the burden of proving its protest by clear and convincing evidence. No hearing will be held on the protest unless the NET RMA RFP Contact agrees to a hearing. The NET RMA RFP Contact or designee will decide the protest based on the written submissions within fifteen (15) days after the NET RMA RFP Contact receives the protest. The NET RMA RFP Contact will furnish copies of the decision in writing to the NET RMA, and each Proposer. The decision shall be final and conclusive and not subject to legal challenge unless wholly arbitrary. If necessary, to address the issues raised in the protest, the NET RMA will make appropriate revisions to the RFP by issuing addenda. The NET RMA may in its sole discretion extend the Proposal Due Date, if necessary, to address any protest issues.

Notwithstanding the existence of a protest, the NET RMA may, in its sole discretion and unless otherwise precluded by a court order, continue the procurement process or any portion thereof.



The failure of a Proposer to raise a ground for a protest regarding the RFP within the applicable period shall constitute an unconditional waiver of the right to protest the terms of the RFP and shall preclude consideration of that ground in any protest of qualification of a Proposer unless such ground was not and could not have been known to Proposer in time to protest prior to the final date for such protests.

## 2.8.2 PROTESTS REGARDING RESPONSIVENESS DETERMINATION OR AWARD

A Proposer may protest any determination by the NET RMA regarding lack of responsiveness or any award made by the NET RMA by filing a written notice of protest by hand delivery or courier to the NET RMA RFP Contact with a copy to the NET RMA Executive Director and the other Proposers. The notice of protest shall specifically state the grounds of the protest.

Notice of protest of any non-responsiveness determination must be filed within five (5) days after the notification of non-responsiveness. Notice of protest of any award by the NET RMA must be filed within five (5) days after the NET RMA announcement of an apparent Best-Value Proposer.

Within seven (7) days of the notice of protest, the protesting Proposer must file with the NET RMA RFP Contact and provide a copy to the NET RMA Executive Director and the other Proposers, a detailed statement of the grounds, legal authorities and facts, including all documents and evidentiary statements, in support of the protest. Evidentiary statements, if any, shall be submitted under penalty of perjury. The protesting Proposer shall have the burden of proving its protest by clear and convincing evidence.

Failure to file a notice of protest or a detailed statement within the applicable period shall constitute a waiver of the right to protest the evaluation or qualification process and decisions there under, other than any protest based on facts not reasonably ascertainable as of such date.

The NET RMA and the other Proposers may file by hand delivery or courier to the NET RMA RFP Contact, with a copy to the protesting Proposer, a statement in support of or in opposition to the protest. Other Proposers shall also deliver a copy of their statement to the NET RMA Executive Director. Such statements must be filed within seven (7) days after the protesting Proposer files a detailed statement of protest.

Unless otherwise required by law, no evidentiary hearing or oral argument shall be provided, except, in the sole discretion of the NET RMA RFP Contact or designee, a hearing or argument may be permitted if necessary, for protection of the public interest or an expressed, legally recognized interest of a Proposer or the NET RMA. The NET RMA RFP Contact or his designee will issue a written decision regarding the protest within fifteen (15) days after the NET RMA RFP Contact receives the detailed statement of protest. Such decision shall be final and conclusive and not subject to legal challenge unless wholly arbitrary. The NET RMA RFP Contact will deliver the written decision to the NET RMA and each Proposer.

If the NET RMA RFP Contact or designee concludes that the Proposer filing the protest has established a basis for protest, the NET RMA RFP Contact or designee will determine what remedial steps or actions, if any, are necessary.

### 2.8.3 COSTS AND DAMAGES

All costs of a protest shall be the responsibility of the protestor and undertaken at the protestor's expense. In addition, if the protest is denied, the Proposer filing the protest shall be liable for the NET RMA costs reasonably incurred in defending against the protest, including legal and consultant fees and costs, and any other damages sustained by the NET RMA as a consequence of the protest. The NET RMA shall not be liable for damages to Proposer filing the protest or to any participant in the protest, on any basis, expressed or implied.

### 2.9 COSTS FOR PREPARING PROPOSALS

The cost for developing the Proposal and participating in the procurement process (including the protest process) is the sole responsibility of the Proposer. NET RMA will not provide reimbursement for any costs.

### 2.10 RELEASE OF INFORMATION AND PUBLIC INFORMATION ACT COMPLIANCE

All responses to this RFP shall be deemed, once submitted, to be the property of the NET RMA. Response documents may be subject to public disclosure under the Texas Public Information Act ("PIA"). Any material deemed to be proprietary, confidential, or otherwise exempt from disclosure under the PIA should be clearly marked as such. If the NET RMA receives a request for public disclosure of all or any portion of a proposal, the NET RMA will use reasonable efforts to notify the proposer of the request and give the proposer an opportunity to assert, in writing to the Office of the Attorney General, a claimed exception under the Act or other applicable law within the time period allowed under the Act.

### 2.11 MINIMUM QUALIFICATIONS

Proposer must submit no less than three (3) verifiable references of having at least one ORT or AET system implementation and operation of similar scope and size. The qualifying proposer does not need to be a U.S. company. References must include Project Name, Contact Name, Phone, and E-mail Address.

### 2.12 SUBMITTAL INSTRUCTIONS

Listed below are key action items and instructions related to this RFP. Section 1.5 Schedule of Events identifies the dates and time for these key action items. This portion of the RFP provides instructions regarding preparing and submitting a Proposal to the RFP.

#### 2.12.1 PREPARING A RESPONSE

When preparing a response, the Proposer must comply with the following:

- 1) Use the nomenclature and follow the format instructions provided.
- 2) Complete APPENDIX D Cost Proposal.

- 3) Complete each question in APPENDIX C NET RMA Technical Response Guide as instructed therein and include this APPENDIX C as a part of the Proposal.
- 4) Label any and all files using the corresponding section numbers of the RFP so that NET RMA can easily organize and navigate the Proposer's Proposal.
- 5) The Proposal shall not utilize less than an 11-point font.
- 6) The Proposal shall not exceed 200 pages, excluding Cover Letter, Executive Summary, Minimum Qualifications, any required forms, and cut sheets provided by Proposer to demonstrate equipment specifications.

### 2.12.2 PACKAGING THE RESPONSE

Proposals must be divided into two (2) appropriately labeled and sealed packages - a Technical Proposal and a Cost Proposal.

The contents of each package will include:

- 1) Technical Proposal:
  - A. RFP Cover Page, completed and signed Certificate of Non-Collusion
  - B. Cover Letter
  - C. Acknowledgement of Addenda (APPENDIX I Proposal Forms)
  - D. Performance Bond Letter
  - E. Executive Summary, not to exceed ten (10) pages
  - F. Statement and References of Minimum Qualifications, per Section 2.11 Minimum Qualifications
  - G. Appendix C. NET RMA Technical Response Guide including the following attachments:
    1. Preliminary Installation Plan
    2. Sample Reports or a Draft Reports Manual
    3. Preliminary Project Management Plan
    4. Organization Chart and key personnel resumes
    5. Draft Project Schedule
    6. Preliminary Quality Management Plan
    7. Preliminary Master Test Plan
    8. Preliminary Factory Acceptance Test Plan
    9. Preliminary System Integration Test Plan
    10. Preliminary System Acceptance Plan
    11. Preliminary Preventative Maintenance Schedule
  - H. Appendix I. Proposal Forms, Conflict of Interest Form

DO NOT INCLUDE ANY COST INFORMATION IN YOUR TECHNICAL SUBMISSION.

- 2) Cost Proposal:

The Proposer must complete and sign the Excel APPENDIX D Cost Proposal.





### 2.12.3 HARD COPY AND ELECTRONIC COPIES REQUIRED

The Proposer must provide the following number of copies:

- 1) Technical Proposal:
  - A. One (1) hard copy, with original signature
  - B. One (1) electronic copy (USB drive in both PDF and MS Word formats)
- 2) Cost Proposal:
  - A. One (1) hard copy, with original signature
  - B. One (1) electronic (USB drive) copy of NET RMA provided Excel Worksheets (in both PDF and native XLS format)

Technical Proposal and Cost Proposal USB drives **must be labeled and packaged separately**. In the event of a discrepancy/conflict between a hard copy and electronic versions, the hardcopy version will govern.

### 2.12.4 ELECTRONIC COPIES

Use caution in creating electronic files. If NET RMA is unable to open an electronic file due to a virus or because the file has become corrupted, the Proposer's response may be considered incomplete and disqualified from further consideration.

Use commonly accepted software programs to create electronic files. NET RMA has the capability of viewing documents submitted in the following format: Microsoft Word, Microsoft Excel and portable document format file (PDF).

### 2.12.5 SUBMITTING THE RESPONSE

Mark the outside of shipping package as follows:

Name of Company  
Point of Contact for Company and Phone Number  
RFP Title and Date:

**The Proposer's complete response must be received on or before the due date and time at the following location:**

North East Texas Regional Mobility Authority  
Attention: Ron Fagan, Toll Operations  
1001 ESE Loop 323 Ste 420  
Tyler, TX 75701

**All proposals will be time stamped by NET RMA upon receipt. Proposals received after the due date and time will not be evaluated.**

## 2.13 PROPOSAL EVALUATION AND AWARD

The objective of the evaluation process is to identify the Proposer whose proposal is the most advantageous to the NET RMA. Once the evaluation process has been completed, a final score will be tallied and a recommendation will be made to the NET RMA Evaluation Team concerning the proposal that is the most advantageous to the NET RMA. The ultimate selection of a TSI, if any, will be made by the NET RMA Board of Directors.

### 2.13.1 ADMINISTRATIVE/PRELIMINARY REVIEW

Upon receipt, each proposal will be reviewed by the Issuing Officer to determine the proposal's compliance with the following requirements:

- 1) Proposal was received by deadline.
- 2) Proposal is complete and contains all required documents.
- 3) Proposer meets NET RMA's minimum qualifications of at least one ORT or AET system implementation and operation of similar scope and size.
- 4) Technical Proposal does not include any pricing from the Cost Proposal.

Responses to all minimum qualifications will be evaluated on a pass/fail basis. All proposers shall provide their qualifications information evidencing that it meets NET RMA's minimum qualifications. All proposals which satisfy all criteria of the administrative/preliminary review will have their technical proposal reviewed and scored in accordance with Section 2.13.2 Scoring Criteria of this RFP.

Oral presentations to the evaluation team may be required of one or more of the responding firms.

### 2.13.2 SCORING CRITERIA

The evaluation is comprised of the following:

*Table 2: Scoring Criteria*

Category	Description	Points
Minimum Qualifications	Proposer must include evidence that it meets NET RMA's minimum qualifications of at least one ORT or AET system implementation and operation of similar scope and size. At least three (3) verifiable references will be contacted in order to proceed to Technical Scoring	Pass/Fail
References	References and Past Projects	Pass/Fail
Technical	Scored Requirements Sections	600 Points
Cost	Cost of proposed products and/or services	400 Points
Total		1000 Points

### 2.13.3 COST PROPOSAL

Each Proposer is required to submit a Cost Proposal as part of its response. The Cost Proposal will be evaluated and scored. By submitting a response, the Proposer agrees that it has read, understood, and will abide by the following instructions/rules:

- 1) The submitted Cost Proposal must include all costs of performing pursuant to the final posted Contract.
- 2) Cost proposals containing a minimum order/ship quantity or dollar value, unless otherwise called for in the RFP, will be treated as non-responsive and may not be considered for award.
- 3) In the event there is discrepancy between the Proposer's unit price and extended price, the unit price shall govern.
- 4) The prices quoted and listed in the Cost Proposal shall be the price to provide the services for the initial term of five years Options will be available to extend the Maintenance period an additional five periods of up to two (2) years each.

### 2.13.4 COST STRUCTURE AND ADDITIONAL INSTRUCTIONS

NET RMA's intent is to structure the cost format to facilitate comparison among all Proposers and foster competition to obtain the best market pricing. Therefore, NET RMA requires that each Proposer's cost be in the format outlined in APPENDIX D Cost Proposal. Each Proposer is cautioned that failure to comply with the instructions listed below, submission of an incomplete offer, or submission of an offer in a different format than the one requested may result in the rejection of the Proposer's proposal.

Enter all information directly into the cost sheet(s). Enter numbers on each cost sheet in "number" (two-place decimal), not "currency" or another format unless otherwise stated. That is, omit dollar signs, commas, and any other non-essential symbols (e.g., \$1,234.50 should be entered as 1234.50). Prices must be in US Dollars.

The Technical Proposal shall not include any pricing from the Cost Proposal.

The Cost Proposal will be reviewed for reasonableness and proper allocation across project deliverables. Failure to reasonably allocate cost among the deliverables may result in proposal disqualification.

The reasonableness review will be a general review of the overall cost proposal and address potential frontend loading of price items such as Mobilization.

### 2.13.5 EVALUATING TECHNICAL REQUIREMENTS

The Technical Evaluation Team will review each proposal to determine its compliance with the RFP technical requirements. A total technical score will be assigned to each proposer.

### 2.13.6 FINAL TECHNICAL SCORE

The Proposer with the highest technical score will have its final technical score adjusted to 600 points. All remaining Proposers shall have their scores adjusted as follows:

$$\text{Adjusted Technical Score under Consideration} = \left( \frac{\text{Technical Score under Consideration}}{\text{Highest Scoring Unadjusted Technical Score}} \right) \times 600$$

### 2.13.7 EVALUATING COST PROPOSAL AND TOTAL COMBINED SCORE

The Cost Proposals will be reviewed and scored in accordance with Section 2.13.8 Cost Scoring. To expedite the evaluation process, NET RMA reserves the right to analyze the Cost Proposals independently, but at the same time the Technical Evaluation Team is analyzing the Technical Proposals. Neither the Cost Proposals nor the cost analysis will be disclosed to the Technical Evaluation Team until the Technical Evaluation Team completes its final evaluation and scoring of the RFP Proposal Factors.

### 2.13.8 COST SCORING

NET RMA will utilize lowest total cost to determine the most competitive Cost Proposal. The Proposer deemed to have the most competitive Cost Proposal overall, as determined by NET RMA, will receive the maximum score for the cost criteria. Other proposals will receive a percentage of the maximum score based on the percentage differential between the most competitive Cost Proposal and the specific proposal in question as follows:

$$\text{Cost Score under Evaluation} = \left( \frac{\text{Lowest Cost Proposal}}{\text{Cost Proposal under Evaluation}} \right) \times 400$$

### 2.13.9 TOTAL COMBINED SCORE

The Proposer's cost score will be combined with the Proposer's technical score to determine the Proposer's overall Total Combined Score.

### 2.13.10 BEST AND FINAL OFFERS (BAFO)

NET RMA reserves the right to request BAFO prices from the Proposers after finalizing combined technical and price proposal scores. NET RMA is not required to request a BAFO.

### 2.13.11 SELECTION AND AWARD

The responsive and responsible Proposer receiving the highest Total Combined Score and with whom NET RMA executed the Contract will be recommended to the Board of Directors. The ultimate selection of the TSI, if any, will be made by the NET RMA Board of Directors.

## 2.14 PROPOSAL WITHDRAWAL AND/OR REVISION FOLLOWING SUBMISSION

A submitted proposal may be withdrawn and changes to a submitted proposal can be made prior to the RFP due date and time. In the event a Proposer notes an error or omission in its response which was overlooked prior to submitting the proposal, the Proposer may contact the Issuing Officer to request the proposal be withdrawn. Unless and until the Proposer resubmits a revised response, NET RMA will have no offer from the Proposer to evaluate for possible Contract award. Any resubmission must be received by NET RMA no later than the RFP due date and time.

## 2.15 CONFLICT OF INTEREST

The Proposer must disclose in detail anything that may create a conflict or appearance of a conflict of interest. In addition, Proposers must familiarize themselves with and comply with the NET RMA's Conflict of Interest Policy for Consultants (available on the NET RMA's web site at <http://www.netrma.org>).

## 2.16 CONTRACTOR RESPONSIBILITY

A Responsible Contractor is one that NET RMA believes to be responsible based on responses provided on the Contractor's responses to the requirements of the solicitation document. NET RMA reserves the right to conduct additional due diligence into any Proposer's responsibility status.

Note that this section on the NET RMA Technical Response Guide (APPENDIX C) requires Proposers to provide documentation regarding litigation history, financial stability, failure to complete, and other items that may impact the determination of contractor responsibility.

# 3 SCOPE OF WORK

The following is the scope of work for this RFP.

## 3.1 GENERAL PROJECT OVERVIEW

The Contract is to provide an ETCS that includes roadside functionality (AVI, AVC, VES, AVD, DVAS, MOMS) and a reporting host system. The TSI shall be responsible for all aspects of system design, testing, installation, integration, training, and maintenance of the Toll 49 facility. Please see APPENDIX F Typical Drawings and Facility Straight Line Diagrams. The TSI has the option to re-use certain roadside tolling equipment/devices; in fact, NET RMA encourages the TSI to re-use as much of the existing equipment as the TSI can certify will meet Service Level Agreement (SLA) requirements identified in Appendix E. SLA Requirements.

The TSI shall provide an ETCS to include the following at a minimum:

- 1) Roadside systems, devices, equipment and infrastructure to support existing tolling operations for ORT and AET.

- 2) Processing, tracking, and storing all transactions and images generated by roadside tolling equipment.
- 3) An interface with CTRMA's Host system.
- 4) An interface with the CUSIOP.
- 5) A comprehensive reporting system.
- 6) Network design, implementation, maintenance, and the ability to monitor availability.
- 7) A Maintenance On-Line Maintenance System (MOMS) that includes configurable alerts/alarms, work order creation, and dashboards.
- 8) Reporting database for NET RMA to access system data to run reports.

More detailed requirements for these systems and subsystems are described in the sections below.

## 3.2 EXISTING EQUIPMENT, INFRASTRUCTURE, AND COMMUNICATIONS

The TSI has the option to re-use certain roadside tolling equipment/devices, along with all existing infrastructure, conduits, cabinets, electrical and communications equipment, and cabling. This section describes the equipment and infrastructure that is currently installed. Unless explicitly stated otherwise, TSI may reuse any or all equipment currently installed, and must certify that the existing equipment will meet appropriate SLAs as are described by APPENDIX E.

NET RMA makes no assertion regarding the condition, functionality or performance of installed equipment. No installed equipment is currently warranted by NET RMA. It is incumbent on the TSI to determine the condition and fitness for use of any currently installed equipment which will be reused. Typical and Facility Straight Line Diagrams (SLDs) are all combined into APPENDIX F Typical Drawings and Facility Straight Line Diagrams for the TSI's reference. All information shown on these drawings is included solely for use in establishing design controls for the project. The accuracy of this information is not guaranteed. It is the proposer's responsibility to inquire of NET RMA if additional information is available, to arrange to review the same prior to bidding, and to conduct whatever site investigation or testing may be required.

All other equipment provided pursuant to this Scope of Work shall also be required to meet the requirements detailed herein and applicable SLAs as described in APPENDIX E. Additionally, the TSI shall uninstall, remove from the premises and properly dispose of any unneeded existing equipment following appropriate NET RMA procedures.

### 3.2.1 EXISTING TOLLING EQUIPMENT

As previously described in the introduction, NET RMA operates the Toll 49 facility. Roadside infrastructure and installation typicals and SLDs of the facility can be found in APPENDIX F Typical Drawings and Straight-Line Diagrams.

An installed equipment list is provided as APPENDIX G Equipment List. It is intended that this list be used, in conjunction with the mandatory site visit by TSI, to understand the equipment that is currently

installed, the age and condition of that equipment, and any re-use or replacement that might be needed on the TSI's part.

### 3.2.2 EXISTING TOLLING STRUCTURES

Existing Toll 49 ETCS equipment is located at or in the tolling gantries along the facility. No additions, modifications and/or structural changes shall be allowed without the written approval of NET RMA. Should the TSI require modifications to the existing infrastructure, any official submittal for NET RMA shall have a minimum 30-day review cycle.

### 3.2.3 EXISTING CABINETS AND ENCLOSURES

Existing Toll 49 roadside cabinets and enclosures shall be re-used and repaired or refurbished if required to meet the specifications described herein. Locks for existing cabinets and enclosures reused by the TSI shall be rekeyed and copies of all keys delivered to NET RMA. Identification badge and biometric readers may be used in lieu of keys to access existing cabinets and enclosures.

Roadside cabinets and enclosures installed at Toll Zones are either ground mounted, pole mounted or attached to sign structures along the Toll 49 facility.

### 3.2.4 EXISTING ROADSIDE NETWORK

The NET RMA roadside network is a private fiber network (See APPENDIX F Typical Drawings and Straight-Line Diagrams).

The TSI shall be responsible for managing the network equipment supporting the Toll 49 ETCS at the access layer of the network. The TSI shall also be responsible for managing the network equipment that is directly connected to the access layer network equipment supporting the Toll 49.

#### 3.2.4.1 EXISTING DATA COMMUNICATIONS

TSI shall review the existing System installation architecture and NET RMA WAN/LAN diagrams that illustrate the communications tiers of the existing System, as well as the connectivity and local carrier public network interaction between the various tiers. NET RMA's Toll 49 existing network diagram is included as APPENDIX F Typical Drawings and Straight-Line Diagrams. For any proposed changes to the existing NET RMA communications network, TSI shall prepare a revised communications network diagram that shows proposed network equipment, conduit and cable, including the following:

- 1) Switches
- 2) Firewalls
- 3) Fiber distribution panel/patch panel
- 4) Fiber optic laterals
- 5) Splice closures
- 6) Third Party Interfaces

TSI shall furnish diagrams and full technical specifications for each proposed change to NET RMA's existing ETCS network. In addition, TSI shall determine if the proposed modified network is capable of meeting and supporting the communication needs of other proposed subsystems to comply with the all performance requirements as described by APPENDIX E Service Level Agreement (SLA) Requirements.

TSI shall be responsible for specifying the bandwidth requirements to support communications between any external service provider(s) and hosting site(s) and all NET RMA internal (e.g., zone controllers, VES processing/storage devices) computers and other ETCS equipment.

TSI shall use network monitoring software to monitor the network status configuration and performance. TSI shall confirm proper integration exists for NET RMA to receive alarms/alerts and have access to reports from the network monitoring system.

### 3.2.5 EXISTING ELECTRICAL INFRASTRUCTURE

The existing electrical service shall be confirmed by the TSI's load analysis associated with each existing utility service drop location shown on the existing electrical drawings. The TSI shall revise existing documentation or otherwise prepare as-built electrical plans detailing connections, conduit, junction boxes, pull boxes, disconnects, and wire to proposed equipment and devices as required to reflect the final installation. The TSI shall furnish and install conduit, wires, cables and appurtenances to proposed equipment and devices pursuant to this RFP and as needed to implement the approved design. The TSI may use the existing electrical system to minimize new work where possible, constrained by retaining existing electrical service to the legacy roadside equipment and devices during the transition to the proposed System.

Any disruptions to the existing tolling system shall be coordinated with NET RMA.

### 3.2.6 EXISTING DEFICIENCIES

After the TSI's assessment of existing equipment and infrastructure, the TSI shall submit a list of all equipment that is intended to be reused, and shall certify to NET RMA that all of the reused equipment identified in the list will meet the Project SLAs as described in APPENDIX E. This list of existing equipment acceptance shall be delivered to NET RMA no later than 90 days after NTP, in accordance with Appendix K – Project Deliverables Schedule, and will communicate all existing equipment defects affecting functionality or performance. Defects identified after the 90-day period will be solely on the TSI to resolve. NET RMA will inspect each claimed defect within 10 business days and determine the appropriate action (e.g., repair, replace, retain as is) and the timing of the action. Any agreed upon repair or replacement work may be performed via a change order with the TSI.

## 3.3 GENERAL REQUIREMENTS

The requirements described in this RFP include the technical requirements for the design, development, fabrication, programming, integration, testing, installation, implementation, operations (such as image review support, system administration) and maintenance of the Express Lane Facilities. The





requirements are largely specified on a functional level to permit the TSI the flexibility in the design and development of the ETCS. The system shall utilize proven and reliable technology capable of meeting NET RMA's operational, maintenance, and performance requirements.

For all roadside equipment that is not re-used by the TSI, the TSI shall provide equipment/systems similar in function, performance and capacity, and shall certify that this equipment will meet the SLAs defined in APPENDIX E.

TSI shall furnish, mobilize, and secure all required facilities, equipment, and resources necessary for initiating, fulfilling and concluding the Contract and may include such portions of the following as are required at the beginning and end of the Project:

- 1) Setting up at the various worksites, storage areas, and other facilities in compliance with NET RMA standard specifications and any other state or local law, rules, regulations or ordinances and the subsequent demobilization and removal from the site of said equipment, appurtenances and the like upon completion of the work.
- 2) Maintenance of Traffic (MOT).
- 3) Obtaining necessary permits and licenses, and payment of fees as required by local, state and federal law.
- 4) Coordinating design, installation and testing activities with NET RMA or NET RMA-designated representatives during various stages of the Project.
- 5) Lighting for all work areas.
- 6) Sampling, testing and or certifying of materials.
- 7) Providing required insurance and bonds.

The TSI shall be responsible for purchasing and maintaining equipment required for development, testing and implementation of the ETCS and future upgrades and changes.

All equipment, supplies and materials furnished under the Contract shall either be new, off-the-shelf, field proven, or certified or accepted in conjunction with NET RMA.

The delivered System shall comply with the following standards:

- 1) All measures shall be US Customary.
- 2) All keyboards shall be QWERTY.
- 3) All currency shall be in US dollars with two decimals.
- 4) All numbers shall be English (United States).
- 5) The time zone used on all reports or screens that are displayed to users/customers shall be Tyler, TX local time.

Proposed hardware shall be designed with the following specifications:

- 1) All components that perform the same function shall be interchangeable.
- 2) Replacement parts and units shall be modular such that each can be changed out with no equipment modification required.

- 3) All field wires and cables shall be terminated on screw lugs or connectors; wherever possible, connectors shall be keyed or polarized to prevent incorrect connections.
- 4) All wire and cable terminations shall be labeled per industry standards.
- 5) Surge suppression shall be provided for all field wiring susceptible to lightning or other transient surges.
- 6) All lane equipment shall be fused or otherwise protected against over current, over voltage, and under voltage.
- 7) A ruggedized power supply shall be provided for all required internal DC voltages.
- 8) All equipment shall be properly bonded and connected to the grounding electrode system to ensure the safety of maintenance personnel.
- 9) All field cabinets shall have surge suppression on copper wires and/or cables entering the cabinet.

### 3.3.1 COMPLIANCE WITH INSTALLATION & DESIGN STANDARDS

The TSI shall adhere to all installation standards, applicable laws, ordinances, and codes as specified in IEEE and NEC standards, and TXDOT Standards and Details. The TSI shall be responsible for all costs associated with any permits, plan reviews and inspections, and shall procure any required documentation related to proper installation standards, laws, ordinances or codes. The TSI shall label all wiring and cabling at both ends in accordance with TIA/EIA-606-A. All enclosures/cabinets shall have nameplates installed to ensure unique identification.

### 3.3.2 COOPERATION WITH OTHERS

NET RMA shall be entitled to full and prompt cooperation of the TSI in all aspects of the Work. The TSI shall use best efforts to minimize any disruption to NET RMA's normal business operations (including a.m. and p.m. peak hours as applicable) when the TSI is performing services. The TSI shall work closely with other contractors who will be working for NET RMA in coordinating any activity which may affect both the contractors and NET RMA.

The TSI shall cooperate with other parties, including vendors, governmental agencies, and other maintenance providers, as required, to ensure that design, implementation, and maintenance functions are handled effectively, efficiently, and according to all laws, rules, regulations, and specifications of any applicable vendors, governmental agencies, and other maintenance providers.

## 3.4 ELECTRICAL WORK REQUIREMENTS

Any electrical work to be performed by electricians must be licensed in the State of Texas. All electrical work shall be performed in accordance with the applicable regulations. Appropriate NEC compliance shall be adhered to with all electrical articles for installation pertaining to wiring, enclosures, and other electrical equipment, including lightning protection. The TSI shall tie into the existing site grounding and lightning protection system.

### 3.5 COMMUNICATION WORK REQUIREMENTS

The existing communication system infrastructure shall be re-used to the maximum extent possible to minimize the need for new laterals from an existing fiber backbone pull box to a proposed or existing equipment location.

If new communications infrastructure is required, all work shall conform to NET RMA standards and specifications.

Any work that results in disruptions to the existing communications system shall be coordinated in advance to notify NET RMA and all parties affected and should be planned to be conducted when impacts are minimized.

### 3.6 ENVIRONMENTAL REQUIREMENTS

Proposed roadside System equipment and devices shall be installed per manufacturer requirements. The TSI shall thoroughly investigate all environmental factors that may affect the operation, reliability, and life of proposed equipment and devices and select items appropriate for operation in the installed site environment and available existing infrastructure.

### 3.7 INSTALLATION AND TRANSITION FROM EXISTING SYSTEM

The TSI shall be responsible for the installation of all proposed hardware, equipment, and devices required to operate and maintain an ETCS that meets all the requirements described herein. To perform installation of the roadside systems, the TSI shall supply all qualified installation personnel, tools, materials, equipment required, and traffic control devices. The TSI shall install all components manufactured/provided by any third parties in accordance with the manufacturer's installation instructions. In addition, the TSI shall arrange on-site and remote support services, as needed, from third-party vendor(s) for proper installation and operation of equipment at no additional cost to NET RMA.

The TSI shall be responsible for procuring and installing any additional infrastructure (excluding any existing infrastructure described herein) that may be required to operate and maintain the ETCS. This may include, but not limited to, additional electrical and communication conduit, duct, pull boxes, junction boxes, wires, cables, connectors, terminals, and termination labels.

The TSI shall be responsible for installing and configuring the proposed ETCS software and any supporting software (e.g., operating system, networking, database, monitoring) on all proposed computers, workstations, and servers. If this work impacts existing employees, then the work shall be coordinated with NET RMA operations and may need to occur after hours or on the weekends to minimize impacts to operations. All TSI provided systems need to be compatible to run on NET RMA-provided workstations and NET RMA designated representative-provided workstations.

Where existing infrastructure will not be re-used, the TSI shall submit installation drawings detailing new installation requirements for NET RMA's review and approval. All documentation regarding the

equipment installation shall be maintained by the TSI and made accessible to NET RMA or their representatives upon request.

The TSI shall develop an Equipment Installation Checklist for review and approval by NET RMA. This Transition Checklist will be used by the TSI as tolling points or the Toll Facility Host are transitioned into a revenue collection capacity. It shall include specific dates and times, shall describe all tasks that are required, and shall have space for NET RMA to sign off on each task.

### 3.7.1 INSTALLATION PLAN

The TSI shall submit an Installation Plan to NET RMA for review, comment, and approval prior to the start of any installation activities.

The Installation Plan shall provide a comprehensive description of all aspects of the installation activities associated with the project, including the following:

- 1) A detailed installation schedule including all task durations, dependencies, resources, key “Go/No-Go” checkpoints
- 2) A description of installation resources including personnel and equipment (Should changes occur to the personnel, an updated staffing list shall be submitted to NET RMA.)
- 3) A description of any special or unique installation requirements
- 4) A description of all MOT requirements
- 5) Monitoring and validation efforts planned to ensure all ETCS components are functioning as expected
- 6) A detailed component list and description of how each item, version number, and serial number is installed
- 7) Rollback requirements as applicable

The TSI shall provide a Bill of Materials (BOM) for all hardware, COTS software, and equipment both supplied and reused under this Agreement, including spare inventory. All COTS hardware shall be described by manufacturer, vendor contact information, model or part number, and feature set. The BOM shall be included with the SDDD submittal. The BOM will be reviewed and approved by NET RMA.

The TSI shall provide an installation verification/checklist document to NET RMA for use in verifying that all installed systems (Hardware) match appropriate design documentation. This checklist shall include (at least) columns for Manufacturer, Model No., Serial No., Release (for firmware if required), and Operating System for comparison with design documentation and product specific cut sheets.

### 3.7.2 HANDLING, STORAGE AND DELIVERY

The TSI shall protect the quality of products required by the Contract by using documented inspection, handling, storage, and preservation processes. The TSI shall follow Return Merchandise Authorization processing, packaging, and shipping procedures.

### 3.7.3 MAINTENANCE OF TRAFFIC

The TSI shall provide a Maintenance of Traffic (MOT) Plan for NET RMA approval. This MOT Plan shall be provided prior to performing any work within the limits of the Toll 49 facility. This MOT Plan shall conform to the latest edition of the Manual of Uniform Traffic Control Devices (MUTCD) and follow all local and state requirements. The TSI shall have the responsibility of the setup and removal of all MOT devices when required and directed by NET RMA.

During installation, the TSI shall communicate all lane closure requests at least two (2) weeks in advance of the anticipated closure to NET RMA for approval.

### 3.7.4 SPARE HARDWARE

The TSI shall develop and submit an Initial Spare Stock Listing (ISSL) to support the Implementation Phase of the Project delivery. Once Operations have begun, the TSI shall use the ISSL as the starting point in creating a specific approach to calculating optimum supply levels as the system continues to mature as part of its normal service life. Supply levels can be fully ascertained only if the performance and repair characteristics of the specific equipment are known, documented, and updated. It is therefore expected that the ISSL will become a living document that is subject to change and update throughout the system's service life.

The TSI shall maintain a spare parts/component inventory and adjust stock levels to the most cost effective, efficient levels. The maintenance force shall keep all parts and components in a fully serviceable condition ready for immediate installation. All spares shall be fully tested and stored in a serviceable condition to support rapid response time. The TSI shall use the MOMS application for inventory control and parts listing.

The proposed MOMS shall include an equipment inventory database to be used as a tool in the ordering, stocking, repair, and replenishment of all equipment in the system. The database shall include identification information such as nomenclature, part number, serial number, supplier, date of delivery, age or usage limitation, repair and replenishment lead times, cost, and shelf life.

In addition, re-order and repair instructions shall be prepared automatically when the available inventory falls below established thresholds. The thresholds can be established based on repair and replace rules embodied in the subsystem. The TSI shall make recommendations for anticipated replacement of equipment in the coming fiscal year at least three months before the new fiscal year, which begins October 1. NET RMA will review these recommendations and upon agreement with the TSI make the necessary budget adjustments.

The MOMS shall have the capability of accessing the inventory and spare parts database in an automated form. This function shall be integrated with the Work Order generation function, which will automatically update and maintain the system and spare parts inventory based on Work Orders and technician input during a work order closeout.

### 3.8 ROADSIDE SYSTEM REQUIREMENTS

The following requirements are provided should a Proposer elect to replace existing equipment in lieu of retaining the incumbent equipment. Any new components and/or subsystems shall meet and comply with the following sections.

#### 3.8.1 ZONE CONTROLLER SUBSYSTEM

The TSI may re-use existing Zone Controllers or Lane Controllers after certifying and accepting, in conjunction with NET RMA, the existing equipment. Zone Controllers, whether new or re-used, shall be required to meet all applicable SLAs, as described in APPENDIX E. Zone controllers are required to be implemented in a redundant configuration/capacity. The Zone Controller failover system shall ensure that there is no loss of transactions or revenue due to a single Zone Controller failing. Failover of a single Zone Controller shall not disrupt the operation of the rest of the system(s). Alarm messages shall be generated and transmitted to the MOMS whenever a Zone Controller failover or outage event occurs.

The Zone Controller hardware in all Zone Controllers shall be capable to process Transaction Record volumes of at least 3,000 vehicles per lane per hour.

##### 3.8.1.1 STAND ALONE OPERATION

Zone Controllers shall be capable of operating in a standalone mode if communication between the Zone Controller and TFH is down. While in standalone mode, the Zone Controllers shall be capable of storing all transaction records, events and maintenance messages for a minimum of thirty (30) days. When operating in this mode, the last TVL, LPL, configuration, security access, and application files downloaded from the TFH shall be used until communication is restored or files are uploaded locally. Upon restoring communication with the TFH, all back-logged messages shall be transmitted without affecting near real-time transmission of ongoing transactions.

##### 3.8.1.2 SOFTWARE

Zone Controllers shall process data obtained from AVI, AVD, AVC, VES and other roadside devices and equipment systems to generate transaction records for each passing vehicle.

The operating systems, databases, COTS software, and ETCS software provided by the TSI shall support near real time transaction creation. The proposed operating systems and databases shall be currently supported versions/releases (no Beta releases) with a future upgrade path.

Zone Controller software shall be parameter driven and configurable and shall be warranted against software defects and deficiencies until the Contract is terminated.

The TSI shall utilize appropriate protocols and data structures to accomplish communications between various components, sensors, peripherals, and subsystems. All messages between the Zone Controller and the VES (e.g., OCR data, triggers, transaction link data), AVI, AVD, and AVC subsystems, and the TFH

shall use a documented, non-proprietary protocol that is made available to and approved by NET RMA during the Design Phase of the Project.

Zone Controllers shall be required to detect and frame vehicles and associate all transactions (including those with valid transponders) with VES images. The detailed transaction processing rules, including processing rules for incomplete transactions, along with all Transaction Record details shall be defined and finalized during the Design Phase; however, the following basic requirements shall apply:

- 1) For each individual vehicle, transponders (issued by NET RMA or an interoperable agency) shall be read in accordance with the SLA requirement(s) and these transponders shall be processed and reported in that vehicle's Transaction Record(s) in the following order:
  - A. Valid home agency transponder (if multiple valid home agency transponders, order transponder entries by number of handshakes)
  - B. Valid interoperable transponder (if multiple valid interoperable transponders, order transponder by number of handshakes)
- 2) One and only one transaction record shall be created for each vehicle that travels through a toll zone, and Zone Controllers shall ensure all available input data has been written to the transaction record prior to transmitting it to the TFH.
- 3) Vehicle length shall be included in each vehicle transaction record.
- 4) The Zone Controllers shall be able to automatically synchronize with the various sensors and subsystems at the lane level to ensure the events in the lane are associated with the correct vehicle transaction record.

### 3.8.1.3 TIME SYNCHRONIZATION

Zone Controllers shall be time synchronized to the TFH at the time of Zone Controller startup and periodically thereafter. The Zone Controller shall synchronize or transmit time synchronization messages with every connected Toll Zone subsystem or equipment capable of maintaining time.

### 3.8.1.4 CONFIGURATION FILES

All parameters and settings required to operate the Zone Controller application shall be maintained in a configuration file or files. A copy of the current Zone Controller configuration files shall be maintained on the TFH and shall be available for downloading along with the Zone Controller application file, as needed. Authorized personnel shall be able to make changes to the configuration file resident in the Zone Controller while in the field. Changes made in the field shall be backed up to the TFH. Any configuration files changed in the field shall be logged and assessed for applicability to all Zone Controllers and downloaded to other Zone Controllers, accordingly. All Zone Controllers shall have default configuration files that allow the lane to startup automatically. All Zone Controllers shall operate with the same software version unless exceptions to this requirement are approved by NET RMA.

### 3.8.2 AVI (RFID) SUBSYSTEM

If the TSI elects to replace existing AVI equipment, then all required AVI hardware, software and related equipment including required mounting brackets and hardware shall be furnished by the TSI. If proposed new equipment results in an increase in non-dynamic/static forces or dynamic/live load on an existing support structures, TSI shall perform a structural analysis of the existing support structure using a licensed professional structural engineer registered in the State of Texas. The results of this analysis shall be made available to NET RMA. Any changes to existing structures or loading shall require approval by NET RMA.

TSI shall determine the need for conducting RF interference tests at all proposed Project sites that are currently equipped with RFID products to assure all related licensing and requirements are satisfied and to be aware of any RF sources that may interfere with the ETCS. NET RMA currently operates its AVI readers on the Toll 49 facility between 902.5 MHz and 921.5 MHz.

The TSI is responsible for compiling all Federal Communication Commission (FCC) licensing materials. The TSI shall provide AVI location and support structure information in compliance with FCC standards, and provide the completed form(s) to NET RMA for submission to the FCC. After initial installation, the TSI is also responsible for providing any FCC required maintenance forms, completed and submitted to NET RMA for submission to the FCC.

NET RMA is responsible for submitting the completed forms to the FCC and the payment of all related FCC licensing costs.

The TSI provided system shall be required to support at least three protocols. AVI systems on the Toll 49 facility currently read ATA and 6B protocol transponders and are required to support the ISO-18000 6C should it be chosen for national interoperability.

NET RMA does not write to any transponders via the roadside ETCS.

TSI shall be responsible for the AVI subsystem including any design, provision and installation involving enclosures (including heating/cooling if required), cabling, brackets and ancillary components required for the proper functioning/operation of this subsystem within the performance requirements identified in APPENDIX E.

The TSI shall provide certification that any new proposed reader's 6C capabilities have been certified by an approved independent third-party laboratory (e.g., Certification under the OmniAir Certification Services' ISO 18000-6C Certification Program will satisfy this requirement).

TSI shall ensure the RFID readers must each store all information related to at least 125,000 transponder reads in the event the RFID operates in a stand-alone mode (no Zone Controller connectivity).



### 3.8.3 VIOLATION ENFORCEMENT SUBSYSTEM (VES)

Should the TSI choose not to re-use any existing VES equipment located on the Toll 49 facility, the TSI shall provide all necessary hardware, software and related equipment required to support VES requirements as described herein. VES requirements include the following:

- 1) All transactions (including those with transponders) shall have images captured and associated.
- 2) Meet the VES performance and accuracy requirements in APPENDIX E Service Level Agreement (SLA) Requirements.
- 3) Capture images of the rear license plate (if present) of all vehicles that pass under a gantry.
- 4) Captured images must include legible license plate information and vehicle image data.
- 5) Buffer/store images locally (either in the Toll Zone or a Host system) until successful image transmission to the applicable storage location for image review.
- 6) Store all images (including those associated with valid AVI Transactions) for a configurable rolling time period in accordance with the Data Retention Guidelines (APPENDIX J NET RMA Data Retention Guidelines).
- 7) Images shall be made available to CTRMA's Host in accordance with the accepted Interface Control Document (ICD)
- 8) Images shall be stored in a format which best supports OCR and ALPR processing for a configurable rolling time frame, in accordance with the Data Retention Guidelines (APPENDIX J NET RMA Data Retention Guidelines).
- 9) Images shall be stored image-by-image as separate digital files, in open-standard file architecture linked to the transaction record.
- 10) To support rapid detection of poor performing cameras, the VES shall send alarm messages to MOMS that indicate if the image quality of a VES camera has degraded such that its OCR confidence falls below a configurable threshold based on the rolling average of a configurable number of images, or a camera is producing black (no picture) images.
- 11) Cameras and illumination devices shall support a capture rate of no fewer than two vehicles per second.

If the TSI elects to mount VES components on new or existing structures, the TSI shall be responsible for all structural engineering design materials, procurement, and installation. The TSI is required to submit shop drawings, for NET RMA approval, prior to installation of such equipment. Changes to new or existing infrastructure shall to be approved by NET RMA.

#### 3.8.3.1 VES CAMERAS AND ILLUMINATION

The TSI shall either provide new or shall retain the existing VES Cameras and illumination devices. All proposed VES cameras shall provide for the following at a minimum:

- 1) Color cameras shall be used for all images.
- 2) Capture images of the rear license plates and vehicle overview of all vehicles that pass under a gantry.

- 3) Properly capture images of all vehicle license plates with sufficient sharpness to automatically extract the plate number, type and state jurisdiction in compliance with the performance requirements in APPENDIX E Service Level Agreement (SLA) Requirements.
- 4) Provide camera illumination mounted/installed in such a way as to prevent distracting or affecting the vision of drivers.

### 3.8.4 VEHICLE DETECTION AND SEPARATION SUBSYSTEM

If the TSI chooses not to reuse the existing vehicle detection and classification system, the TSI's vehicle detection, separation and classification system shall be capable of:

- 1) Detecting vehicles at speeds in accordance with the SLA requirements
- 2) Separating vehicles at speeds in accordance with the SLA requirements
- 3) Classifying vehicles at speeds in accordance with the SLA requirements

The vehicle detection and separation subsystem system shall provide vehicle event messages and signals to the zone controller and may also directly trigger the VES cameras. The status of the vehicle detection, separation, and classification subsystem shall be reported to the MOMS and Zone Controller shall write health status codes to transaction records indicating a degraded state when the transaction is built.

### 3.8.5 AUTOMATIC VEHICLE CLASSIFICATION

An above ground, axle-based Automatic Vehicle Classification (AVC) solution that is not cost prohibitive and meets all technical requirements would be given strong consideration as a favored approach. Components that are invasive to the roadway surface such as treadles and inductive loop detectors can contribute to issues with roadway resurfacing. The TSI is encouraged to provide designs that will contribute to an infrastructure that takes into consideration all aspects of long term maintenance and support. It is however incumbent on respondents to provide a technically compliant, competitively priced solution and meets stated requirements. An above ground AVC solution is not a hard requirement, and NET RMA will rely on industry expertise in addressing this issue. Evidence of successful deployment and operation of a production configuration system of any proposed design to this RFP shall be provided in Appendix C. Technical Response Guide.

### 3.8.6 UNINTERRUPTIBLE POWER SUPPLY SUBSYSTEM

All toll equipment shall be UPS protected and supported with a minimum of two (2) hour runtime. The TSI shall monitor all UPS alerts in addition to a smart interface, which may include Simple Network Monitoring Protocol using a COTS smart interface routine. Should the TSI chose not to reuse the existing UPS System, the TSI shall furnish a UPS to be mounted in cabinets that include an exterior locking receptacle for plugging in a portable generator to allow connectivity with no tools required. If an online UPS fails, an auto-sync transfer shall bridge line power and utility power in less than 5ms resulting in no power loss, only backup power capability. A surge protection device shall be used to protect utility service that is not UPS filtered. UPS installation shall include a bypass switch to allow maintenance of

the UPS module while continuing to service the current electrical load. Whenever any of the following occur, an alert/alarm shall be generated and sent to maintenance personnel and NET RMA staff via the MOMS:

- 1) UPS detects loss of utility electrical service
- 2) UPS battery level reaches a configurable low point
- 3) Whenever UPS is bypassed or disconnected

All gantry equipment related to the roadside ETCS shall be protected by UPS. Further all standby generators currently installed will be integrated into the system to function in the event of power failure. Current locations with generators are:

- 1) Prairie Creek Mainline
- 2) SH 64 North Bound
- 3) SH 31 Mainline
- 4) Saline Creek Mainline
- 5) FM 2493 East Bound
- 6) FM 756 / Paluxy Drive East Bound
- 7) SH 110 Mainline

### 3.8.7 DIGITAL VIDEO AUDIT SYSTEM (DVAS)

The TSI shall provide a DVAS that enables NET RMA staff to verify/reconcile/audit toll transactions at up to three (3) gantries each quarter. The cameras in support of this DVAS must be able to be relocated each quarter to a different set of gantries. NET RMA will communicate to the TSI at the beginning of each quarter which gantries, and specific mounting locations for cameras. The TSI shall provide all necessary hardware, software and ancillary equipment required to support this DVAS deployment along the Toll 49 facility. TSI maintenance personnel shall be responsible to relocate DVAS cameras quarterly. NET RMA may choose not to implement this DVAS system. The TSI is required to submit pricing for a DVAS system that meets the following requirements in the Price Proposal such that NET RMA can make an informed decision on the purchase and implementation of the system. The DVAS shall include the following:

- 1) Interfacing with the zone controller(s) for vehicle transactional data to include elements such as individual loop state changes, AVI tag reads, location (lane, Gantry/Plaza), data/time, and violation indication.
- 2) Zone Controller transactional data (as above) shall be overlaid onto the video data displayed on screen.
- 3) Cameras shall meet the following minimum specification:
  - a) Artificial Light Frequency: 60 Hz.
  - b) TV Video Out: NTSC
  - c) Video Type: MOV or MP4
  - d) Video Data Rate: High (A camera setting that sets the maximum data rate)
  - e) Video Clip Length: 15 Mins.

- f) Wide Dynamic Range: On
- g) Field of View: Wide
- 4) Video Resolution: 848x480 Video review and playback application must be available to be used by NET RMA staff, or by NET RMA representatives at any location with no additional fees or conditions.
- 5) The user interface shall provide the capability to select and review video based on timeframe, location (lane/gantry), tag number, transaction number, and shall allow the selected video to be replayed in real-time, in slow motion, frame by frame, and shall allow the user to “scroll” through the selected video with a pointing device (mouse).
- 6) Whenever video data is being reviewed, the corresponding transactional data shall be displayed on screen. As video is “scrolled”, transactional data elements shall “scroll” with the video.
- 7) Provide the ability to print selected video images with associated transactional data.
- 8) All digitized video with corresponding synchronized transactional data shall be stored to allow historical viewing and analysis (see APPENDIX J NET RMA Data Retention Guidelines).
- 9) Video shall be stored in an unencrypted format and available for review without the use of special equipment or software in a standard format (e.g., AVI, MP4, MOV).
- 10) Video needs to be available for streaming to remote locations (off-site from NET RMA).
- 11) DVAS Cameras shall allow an authorized operator/user to individually configure them, and configuration settings shall be available on a per-camera basis.

### 3.9 TOLL FACILITY HOST SYSTEM

NET RMA requires a Toll Facility Host (TFH) system to perform ETCS functions that meet the requirements as described herein. The TSI is responsible for all aspects of the design, development, testing and implementation of the TFH, which shall meet the performance requirements as described in APPENDIX E Service Level Agreement (SLA) Requirements. The TSI shall provide a TFH that is fully redundant by way of active/active high availability clustering, or by way of a failover Disaster Recovery (DR) site, cloud-based DR or DR service.

The TFH subsystems shall be web-based and accessible by NET RMA staff and NET RMA-designated representatives through logins without the installation of software. TFH must be accessible without a VPN network if accessed through NET RMA’s network and by way of a VPN/remote desktop if user is not on the NET RMA network.

The TFH shall provide for the following subsystems and functionalities:

- 1) Reports
- 2) Transaction Auditing GUI and report(s)
- 3) VES Image Storage
- 4) Interfaces to internal and external systems
- 5) Maintenance On-Line Management System (MOMS)

### 3.9.1 REPORTS

The TSI shall develop and deliver a reporting system in support of the operational, financial, performance, and audit requirements of the NET RMA. Transaction, reconciliation, maintenance, performance (e.g., SLAs), configuration management, asset management, operational, audit and security reports shall all be available to NET RMA on a daily, weekly, and monthly basis. The reporting system shall support full transaction level reconciliation and auditability from the lane to posting at the Central U.S. IOP Hub (CUSIOP). Report generation execution times and data output limits shall be governed by the SLAs defined in APPENDIX E.

#### 3.9.1.1 GENERAL REQUIREMENTS

The TSI shall facilitate reports development workshops with NET RMA during the Design Phases using the following reports development methodology:

- 1) TSI shall gather fundamental reporting requirements by answering these questions:
  - A. What is the purpose of the report and how will it be used?
  - B. Who will use it and who are the secondary consumers of the report?
  - C. Report frequency?
  - D. Data sources?
  - E. To which other reports shall this report tie?
  - F. Summary, detailed level, or both?
  - G. Basic layout?
- 2) TSI shall provide a proof of concept/mock-up for NET RMA approval, including report data element dictionary which shows the source or calculations for each data element, and explanation of how the report should compare, or match with other report(s). TSI shall gather feedback and requirements refinements and update the mockups.
- 3) Final review with NET RMA for minor changes only.
- 4) Production release.

In addition to the TSI's standard suite of reports, the TSI shall be responsible for designing, developing, testing, and implementing up to ten (10) custom reports based on NET RMA's requirements during the Design and Operational Phases of the project. Additionally, six (6) months after system acceptance, the TSI shall support significant updates to up to ten (10) reports. These report changes (for custom or standard reports) shall be provided to NET RMA at no additional cost.

The TSI shall provide ad hoc reporting capability to NET RMA via a NET RMA Report Server.

With the System Detailed Design Document (SDDD) and the As-Built documentation, the TSI shall provide a Reports Manual that shall include all available reports. The Reports Manual shall include at least:

- 1) Name of the report
- 2) Report description

- 3) Version number
- 4) Identification of report field level reconciliation (i.e., which fields in one report can be reconciled to another)
- 5) Data element dictionary defining each data element in the report to be updated and maintained by the TSI as reports may be modified over time. With any new release of a report, the corresponding data dictionary must be updated and provided for approval to NET RMA along with the report
- 6) Latest date of any revision
- 7) Sample report
- 8) SQL queries (or similar construct)

The Reporting System shall generate, display, export, and store reports as per the following requirements:

- 1) Report generation screens shall be standardized such that layout, entry fields, buttons, search functionality, and similar features are the same across all reports.
- 2) Multiple tabs shall be avoided.
- 3) Date and time entry fields shall have a feature that allows for quick entry of values appropriate and common to the given report, such as a button or link that completes the From Date/Time entry fields from the beginning of the current day and the To Date/Time entry fields with the end of the current day.
- 4) Standard reports shall be scheduled to be generated automatically on a user defined frequency/time or on user demand.
- 5) User access to reports based on pre-defined, configurable user categories.
- 6) Summary and detail level reports shall allow the user to drill down from summarized data fields to obtain the underlying detailed data.
- 7) Standardized report format with headers and footers on all pages that contain the following:
  - a) NET RMA logo
  - b) Report title
  - c) Selection criteria used to generate the report
  - d) Date and time when the report was generated
  - e) Username
  - f) Indicator of whether the report contains adjustment data
  - g) Page number and total number of pages contained in the report
  - h) Subtotals
  - i) Print sizes may range from letter to tabloid size paper
- 8) Column and row titles labeled using terms that are clearly defined in user documentation and applied consistently throughout all reports.
- 9) An unlimited number of columns to display necessary data. Reports that are intended to be printed shall be approved by NET RMA for columns, look and feel.
- 10) Segregation of relevant data by Facility/Segment.
- 11) Selection of one or more specific Facilities/Segments.

- 12) Range of output options including PDF, CSV, Excel 2016 (or later), or screen display.
- 13) Full reconciliation whereas detail level reports support summary level reports and data points (numbers) reconcile between them.
- 14) Transaction, and revenue reports shall be available by Facility/Segment.
- 15) Hourly, daily, weekly, monthly and yearly transaction, and revenue shall be available by location and presented in row/column format as well as in graphical and/or chart format.

### 3.9.1.2 CATEGORIES OF REPORTS

Detailed report requirements shall be defined during the Requirements and Design Phases of the Project. Report categories shall include, but not be limited to the following:

#### Audit and Reconciliation Reports:

- A. Exception Reports
- B. Interface and File Transmission Reconciliation Reports
- C. Revenue Audit and Reconciliation
- D. Transaction Audit and Reconciliation
- E. User Access and Data Modification Reports

#### Maintenance Reports:

- a) Asset Value and Depreciation
- b) Availability and Performance Statistical Reports
- c) Emergency Maintenance
- d) Equipment Health
- e) Equipment Inventory and Tracking
- f) Equipment Use, Failure, Warranty and Repair History
- g) Incidents Log
- h) Scheduled Preventive Maintenance Tasks
- i) Preventive Maintenance Activity
- j) Response and Repair Times
- k) Alarms History
- l) Trend Analysis
- m) Comparative Analysis
- n) SLA Metrics
- o) Equipment, Interface, Subsystem, and Total System Availability
- p) Work Order Status and Tracking

#### Network Monitoring Reports:

- a) Uptime Chart
- b) Activity Report
- c) Managed Device Inventory
- d) All Alerts
- e) All Down Alerts
- f) Network Health

- g) Server Health
- h) Server Performance
- i) WAN Activity
- j) Backup Monitoring
- k) Preventative Maintenance

Transaction Reports:

- a) Detailed Transaction reports that shall report daily, weekly, monthly and yearly transactions and revenue by Facility/Segment/lane.
- b) Detailed transaction report(s) shall include at least the following fields:
  - i. Transaction ID
  - ii. Transponder number(s)
  - iii. Transponder status
  - iv. Transponder agency
  - v. Plate number, state, and type (as applicable)
  - vi. Image URLs
  - vii. Vehicle length/vehicle classification
  - viii. Toll rate
  - ix. Date/time
  - x. location
  - xi. Processing (workflow) status
- b) Detailed Disabled Veteran Discount Report

### 3.9.2 SYSTEM AUDIT REQUIREMENTS

The TFH shall provide audit trails and audit functionality for all transaction processing activity that is performed by the system either automatically or by users. A screen/report shall be provided that allows authorized users to understand all changes made to a transaction and the User ID associated with these changes. System changes shall be included with an appropriate User ID. This screen/report shall include selection criteria such as time-period, location, facility, and other criteria such that specific system audits can be performed.

The TSI will support all NET RMA third party system audits with Subject Matter Expert assistance, including the creation of audit required queries and reports.

#### 3.9.2.1 ROADSIDE TRANSACTIONS

The TFH shall include functionality to fully audit all roadside transactions. A GUI shall be provided that allows authorized users to select date, time, location, and other criteria to audit transactions from the roadside and received by the TFH. The results of all roadside transaction audits shall be reports that contain relevant roadside information and relevant TFH information available in Excel or comma delimited formats. The specific data elements that will be contained in these audit reports shall be agreed to during the design phase but shall include at least the following:



- 1) Roadside Transaction (sent)
  - A. Date and time
  - B. Location
  - C. Transaction ID
  - D. Transponder numbers
  - E. LPN
- 2) TFH (received)
  - A. Date and time
  - B. Location
  - C. Transaction ID
  - D. Transponder numbers
  - E. LPN

These audit reports shall include summary numbers as well that indicate numbers of transactions sent for the selection criteria and number of transactions received for the selection criteria.

### 3.9.3 INTERFACES

The TSI shall utilize non-proprietary industry standard protocols and data structures to accomplish the communications required between various components, peripherals, and subsystems. These protocols and data structures shall be fully detailed by the TSI in the Interface Control Documents developed or complied with during the Design Phase of the Project. At a minimum, all messages between the Zone Controller, VES, AVI system, vehicle separation sensors, and the TFH shall utilize a documented, open (available to NET RMA during the Design Phase) transmission protocol or protocol stack.

As part of the Requirements Phase for the Project, the TSI shall define a list of interfaces and related requirements for the Project. During the Design Phase, the TSI shall develop appropriate ICDs for NET RMA review, comment and approval. These ICDs shall fully describe the interfaces including file formats, message delivery guarantee structure and receipt acknowledgement, error checking and handling, retransmission procedures, archiving, and other related specifications.

These ICDs shall address the physical, functional and performance aspects of all interfaces. Data flow diagrams shall be used to illustrate the objectives of the interface. Proposed security protection consistent with the public exposure of the interface data shall be described.

The TFH shall be required to interface with the following systems:

- 1) CTRMA's Host System
- 2) Central IOP Hub (CUSIOP)

#### 3.9.3.1 CTRMA'S HOST SYSTEM

NET RMA requires that transactions formed by the roadside ETCS be transmitted to the CTRMA Host for final disposition. The TSI will design and develop an operational interface with the CTRMA Host system.

All transactions and associated images created by the NET RMA roadside system(s) will be submitted to CTRMA's Host for additional processing by way of this interface.

NET RMA is favorable to a batch processing interface within a configurable timeframe for all transactions in the same direction of travel combined into a single bundled batch mode before passing to CTRMA or a CUSIOP Hub. The TSI will work with NET RMA, CTRMA, and associated representatives to implement this interface.

### 3.9.3.2 CENTRAL US IOP HUB

NET RMA requires the TSI to deliver an interface with the CUSIOP Hub. While NET RMA will not put this interface into production when the new TFH goes live, TSIs are required to provide pricing for the design, development, testing, and deployment of this interface in the Cost Proposal, Appendix D – Cost Proposal.

## 3.9.4 HARDWARE

### 3.9.4.1 SERVERS AND RACKS

The TSI shall furnish a platform for the TFH. This platform shall include all proposed or existing cabinets, enclosures, servers, storage systems, workstations, cabling, power distribution units, and any ancillary equipment as may be necessary to provide a complete and acceptable transaction processing, data management and reporting system that meets the requirements of this RFP. The TFH shall support continuous Toll 49 ETCS operation during the transition from the existing system.

Any proposed TFH subsystem or component, including servers and all associated hardware elements, shall be of the latest commercially available design and shall incorporate standard commercially available products and components in production at the time of design/development and supported by manufacturers. The TSI shall use proven configurations that support future upgrades to system processors, memory components, and storage systems. The TFH shall be capable of load-balancing all requests and tasks across available processing platforms and share common Network Attached Storage or other storage technologies.

The TSI shall provide a scalable solution that shall support the transaction levels indicated in Appendix E SLAs. For the purposes of system sizing, the TSI should assume 50% of all transactions are image-based).

The System shall scale to support the estimated annual transaction growth (above) with no major hardware, software, building floor space, HVAC or infrastructure changes.

All hardware and equipment supplied for this Project, excluding consumable materials (i.e., material that needs continuous replenishment), shall meet all requirements contained herein including established SLAs, and shall adhere to specified warranty and service contracts requirements. All hardware, equipment, devices, supplies and materials furnished under the Contract shall be new, off-the-shelf and field proven, unless otherwise specified.

Alternatively, a cloud based TFH solution is acceptable as long as it meets the TFH availability and performance SLAs in APPENDIX E Service Level Agreement (SLA) Requirements.

#### 3.9.4.2 DATA STORAGE

The TSI shall propose an efficient solution for storing and accessing data and files for the on-site (or cloud based) TFH and the Disaster Recovery service. The TSI shall follow the Data Retention Guidelines (APPENDIX J NET RMA Data Retention Guidelines) for all data retained by the TFH.

TSI shall maintain and store files for the following:

- 1) Lane and TFH configuration and executable files including version numbers, date and time entered in the production subsystem
- 2) Toll 49 facility toll rates and toll schedules
- 3) TVL and other file versions including updates by date and time received
- 4) Vehicle and license plate image files including toll transaction ID link, location code, date and time
- 5) Security access authorization files by date and time built
- 6) System logs from the TFH servers

TSI shall store all toll transaction records, toll lane events, maintenance messages and work order records.

Authorized users shall have the ability to access the above data through a GUI for display and to generate reports. At least twelve (12) months of the above data shall be available online and for display and reporting in the TFH software.

#### 3.9.4.3 MILITARY VETERAN TOLL DISCOUNT PROGRAM

The TSI's system shall accommodate and incorporate the NETRMA Veterans Discount Program (<https://www.netrma.org/assets/netrma-tolling-road-policies-20160510.pdf>) The NET RMA will allow qualifying military veterans an exemption from the payment of tolls on Toll 49. Section 372.053 of the Texas Transportation Code allows toll agencies the opportunity to reduce or eliminate the payment of tolls for vehicles displaying certain disabled veteran license plates. The NET RMA will provide complete exemption of the toll for these license plates.

The NET RMA will provide complete exemption of the toll for the above described license plates. To support this effort, the proposed system shall provide a means of accurately filtering and reporting the usage of exempt plates and associated tolls for the purpose of system reconciliation.

#### 3.9.5 SOFTWARE

The proposed operating systems and databases shall be currently supported versions with a documented upgrade path from the vendor. All COTS software descriptions shall include manufacturer, version number, feature set, and number of user licenses provided. NET RMA anticipates ten (10) end-

users of the system. The TSI shall provide and maintain a plan for the versioning and maintenance of all COTS products. This shall include a methodology for keeping all products current and the planning and upgrade testing needed to accomplish this. The plan shall include an end of Project checklist verifying all products are the current version and include any executed service contracts. All non-COTS software source code shall only become the property of NET RMA pursuant to events described in the Software Escrow Agreement and shall be maintained at the current production version if use is continued after Project completion. Annual licensing and renewals shall be the responsibility of the TSI. If a NET RMA contract is required, TSI shall maintain a spreadsheet that is submitted annually to NET RMA (or as renewal requires) with the pertinent licensing information. If licensing requires renewal or action on NET RMA's part, the TSI shall make the request of NET RMA at least 45 days prior to expiration date of license or product.

#### 3.9.5.1 OPERATING SYSTEM

The operating system for the TFH server(s) shall be COTS multi-user, multi-tasking and shall be the previous version if latest version/release date is less than 12 months earlier than the Proposal submittal date. The TSI shall obtain all licenses as necessary to meet or support meeting the operations, maintenance and performance requirements. The TSI shall retain allowed copies (i.e., backups) for all software on non-volatile media for periodic system maintenance, upgrades, or restorations. The proposed operating system shall have COTS maintenance support services for the term of the Contract.

Proposed operating system shall have an installed base that ranks in the top three for the selected platform supporting an enterprise-class database. The TSI shall maintain the Operating System by loading all available updates and security patches throughout the term of the operations and maintenance agreement.

#### 3.9.5.2 DATABASE MANAGEMENT SYSTEM

TSI Database Management System (DBMS) version/release date shall be the previous version if latest version/release date is less than 12 months earlier than the Proposal submittal date. The selected DBMS shall have a published upgrade path and support upgrades to operating system, applications, memory, disk drives, and processors.

#### 3.9.5.3 SYSTEM FAILOVER AND RECOVERY

NET RMA requires the TFH hosting location(s) adhere to data center Tier 2 (or greater) power, cooling, redundancy, and security requirements. The Tier 2 (or greater) data center standard must comply with the requirements defined by the Telecommunications Infrastructure Standard for Data Centers (TIA-942). The location(s) where the TFH(s) are implemented shall be equipped with appropriate power and network connectivity to ensure that a seamless transition from one TFH location to another other active/redundant TFH location can be accomplished within the required timeframe to support TFH availability and performance SLAs (see APPENDIX E). Each TFH location shall contain two wide area network connections from separate local loops and shall be configured with active-active failover to

ensure communication resiliency and uninterrupted service. The TSI's design shall ensure that no data captured/created in the facilities is compromised when a TFH fails and/or is brought back to full operation. The TFH locations shall have the appropriate networking infrastructure to support NET RMA bandwidth and operational requirements.

Alternatively, a cloud-based backup/system failover and recovery solution is acceptable as long as it meets the TFH availability and performance SLAs in APPENDIX E.

#### 3.9.5.4 DATA BACKUP AND RECOVERY

The TSI shall provide an automated capability to back up the TFH daily. This backup process shall include a scheduled process for both full and incremental backups. Archived data shall be available to NET RMA within 24 hours of a NET RMA request.

All transactional data (including violation images) shall be retained in accordance with NET RMA retention policy, and then may be archived to a permanent long-term storage only after the data retention time-period has expired (see APPENDIX J).

Summarized transaction, revenue, and image data shall be retained on the TFH and/or in a data warehouse system for at least ten (10) years so performance reports can be generated for trend analysis. System logs shall be retained on the system for three (3) months and then archived, except error and anomaly logs of the network or databases shall be retained until an incident or issue is corrected and closed.

When on-line disk space utilization reaches a configurable high percent of disk capacity, a message shall be transmitted to the MOMS. Deletion of data that has reached its configured expiration timeframe or has been successfully archived shall be automatic, without need for user intervention, and shall generate a message transmitted to the MOMS.

The TSI shall develop and submit a comprehensive Backup Recovery and Archive Plan during the Design Phase of the Project for NET RMA review and approval. This Plan shall address all aspects of the backup, recovery, and archive strategies and processes including but not limited to:

- 1) Backup and recovery plan for all application, database, and/or storage subsystems
- 2) Backup and recovery plan for all roadside subsystems (Zone Controllers and VES data processing units/controllers)
- 3) Integration with MOMS to include alerts and notifications of the success or failure of backup systems or jobs
- 4) Details on data archiving: disk to disk, disk to selected media, and rotational schedule of selected media and offsite storage as well as the frequency of full and incremental data backup for all servers/systems

### 3.9.5.5 SYSTEM SECURITY

Only authorized personnel shall have access to computers and system information on the ETCS computers and network. Using a system of unique User ID and password control, the system shall provide controlled user access that includes sign-on facilities, permission control, and various levels or roles for access to system control, files, directories, and application software. The system shall support changes by NET RMA to the access levels and personnel designated to those roles.

### 3.9.6 DISASTER RECOVERY PLAN

The TSI shall provide a Disaster Recovery Plan (DRP) for NET RMA review, comment, and approval. The DRP shall include at least the following:

- 1) Initial subsystems damage assessment procedure and checklist
- 2) Architecture and description of redundant subsystems and failover processes
- 3) Anticipated successful failover time to DR/redundant site as confirmed by annual failover testing and resource plan
- 4) Roadside equipment data latency assessment
- 5) Emergency contact list
- 6) Personnel roles and responsibilities
- 7) Details of the procedures/processes used in the event of complete destruction of a TFH site, including relocation plans
- 8) Business Continuity Plan

The disaster recovery plan shall be tested as part of Integration testing, and annually thereafter.

## 3.10 PROJECT MANAGEMENT

### 3.10.1 PROJECT MANAGEMENT PLAN (PMP)

TSI shall develop and submit to NET RMA for review and approval a Project Management Plan (PMP) describing the overall management, staffing, and measurable controls that will be used to meet the requirements contained herein. A Preliminary PMP shall be submitted as an Attachment to APPENDIX C NET RMA Technical Response Guide.

The TSI's Project Management Plan shall be submitted in accordance with Appendix K – Project Deliverables Schedule and shall address the approach to project management, including how their project management philosophy and principles are consistent with the latest edition of Project Management Institute's *Project Management Body of Knowledge*. In addition to the PMP requirements in the following sections, the PMP shall include all aspects of communications management, risk management, requirements/scope management, subcontractor management, and shall incorporate the Quality Management Plan, Master Project Schedule and Work Breakdown

Structure. TSI may propose the use of a comprehensive system that supports project management, team collaboration, configuration management, and document management and control.

This Project Management Plan shall be updated periodically to reflect any changes as approved in writing by NET RMA. The TSI shall maintain and keep current all incorporated individual plans, procedures, and processes which comprise the PMP for the duration of the Contract.

### 3.10.1.1 PROJECT STAFFING AND ORGANIZATIONAL CHART

The Preliminary Project Management Plan shall include an organization chart and resumes in accordance with APPENDIX C NET RMA Technical Response Guide listing the key project personnel along with their roles and responsibilities and the percentage of time they will dedicate to the Project. The TSI's key personnel for the Project shall include: Project Manager, Deputy Project Manager, QA/QC Manager, a Software Design/Technical Manager, Installation Manager, Maintenance Manager, Network Manager, and a Safety Manager. The Project Manager and the Deputy Project Manager shall be assigned to the Project full time and shall be the primary points of contact for the Project. The TSI shall not implement single point of contact communications unless directed by NET RMA.

Detailed resumes shall be provided for each key personnel resource and any changes to these key personnel shall be submitted to NET RMA in writing for approval for the duration of the Contract. Additionally, the TSI shall provide background checks of all key staff.

When deliverables are routinely late, or milestones are missed, NET RMA may issue a Notice to Cure to the TSI for Breach of Contract. The cure notice may include a requirement for the TSI to perform an analysis to ascertain adequate staffing levels are being maintained. The TSI shall provide the results of the analysis along with any other findings including a proposed cure within 10 business days of the cure notice. Further, The TSI shall implement the proposed cure within 10 business days of NET RMA acceptance and approval.

TSI shall clearly describe and distinguish categories of work that shall be performed by the TSI's own personnel and those categories that shall be performed by subcontractors, who shall be named in the Proposal and included in the Organizational Chart. The TSI PMP shall include a description of the procedures that will be used for managing all subcontractors, specifically how communications will be addressed, and how any issues that may arise can be escalated. Any TSI modifications from the proposal that includes key personnel or responsibilities to be shifted from TSI to a sub-contractor and vice versa shall be requested in writing from NET RMA.

#### 3.10.1.1.1 TSI PERSONNEL SECURITY

All TSI personnel shall be subject to security and background checks to the satisfaction of NET RMA. The TSI shall obtain written approval from NET RMA for all service personnel.

TSI's personnel shall be issued NET RMA identification badges and shall wear such identification badges at all times when performing duties on the Project. Use of such identification badges for purposes other

than work associated with the Project may result in termination of the employee from the Project, and possible other legal or disciplinary action.

The services and work performed under the Contract are considered confidential. Employees of the TSI shall not discuss their work with other unauthorized personnel, or any individuals not directly associated with the ETCS Project. The TSI shall restrict communication to only NET RMA staff and its designees.

### 3.10.1.2 PLANNING, COMMUNICATIONS AND RECORD KEEPING

The PMP shall include a description of the procedures, tools and techniques that will be used for communication with NET RMA related to planning, communicating project status, issues resolution, and record keeping. The PMP shall address correspondence, document control over submittals and submittal letters, change orders, and reporting of Project status.

#### 3.10.1.2.1 *ONLINE DOCUMENT SHARING & PROJECT MANAGEMENT TOOL*

TSI shall use online project management/collaboration software to manage, share and distribute Project documents and information (e.g., SharePoint, Dropbox™, Sync.com) to NET RMA and designated NET RMA representatives.

#### 3.10.1.2.2 *PROJECT MEETINGS*

Monthly Project Status meetings shall be held at a location in the metropolitan Tyler area designated by NET RMA or remotely and will follow a defined agenda. The TSI shall submit a progress report and a meeting agenda to NET RMA at least three (3) business days prior to the scheduled meeting. The progress report and agenda shall include but not be limited to the following:

- 1) Updated Project schedule showing progress since the previous meeting and including any proposed changes from the latest approved Project schedule
- 2) Completed work description and the percentage complete for each task in progress
- 3) Identification of all critical path tasks
- 4) Risk/Issue matrix changes including associated recommended mitigation/resolution strategies or contingency plans intended to avoid potential delays
- 5) Report on testing activities including status and overview of defect tracking results (when applicable)
- 6) Description of any pending and proposed change orders, or if any change order work is in progress, the status of the associated work
- 7) Accomplishments during the reporting period
- 8) Six (6) week look ahead work plan for activities to be accomplished on the Project
- 9) Updated action items list providing the status of the open action items, identifying and explaining action items that can be closed, and documenting new action items resulting from discussion of outstanding issues and concerns
- 10) Copy of the approved final minutes of the previous meeting



Other project meetings shall be required to address specific issues and tasks. The TSI shall perform the following:

- 1) Coordinate date and time with NET RMA Project Manager and distribute notices of the Project meeting by email and post them on the approved Project document management, sharing and distribution cloud application.
- 2) Prepare the agenda in coordination with NET RMA Project Manager.
- 3) Attend the meeting with all required staff in attendance or present by teleconference.
- 4) Prepare draft minutes of the meeting, with decisions and actions items noted, and forward them to NET RMA Project Manager immediately following (the day of) the meeting.

#### 3.10.1.2.3 RECORDS KEEPING

The TSI shall maintain quality records and data such as records of design reviews and code walk throughs, inspections and test results, records pertaining to nonconforming material, change order documentation, audit results and all other records related to the RFP and resulting Agreement for no less than five (5) years after the expiration of the Agreement. This information shall be made available to NET RMA upon request and at expiration of the Contract.

#### 3.10.1.3 DOCUMENT MANAGEMENT AND CONTROL

All documentation shall be submitted to NET RMA for review, comment and approval. Updated versions of draft documentation may be required by NET RMA before approval is granted. Draft and final versions of documentation shall be delivered electronically to NET RMA using on-line document sharing. Documents shall be delivered in a standard Microsoft Office application format which allows for red-lining and tracking changes. All documents are subject to version control; once submitted to NET RMA, all future revisions of a document shall be submitted in both red-lined and clean versions.

#### 3.10.1.4 PROJECT SCHEDULE

The TSI shall prepare and submit a detailed Project Schedule based on a work breakdown structure that includes all tasks, activities and milestones related to the requirements gathering, design, development, procurement, installation, testing, training, migration, and deployment of the proposed System. The Schedule shall contain all the detailed discrete work packages and planning packages (or lower level tasks/activities) networked with necessary dependencies to support project events. The Project Schedule shall be maintained in Microsoft Project format (Microsoft Office 2016 or newer) and shall identify all milestones and events starting with the NTP, to the end of implementation phase, culminating with Final System Acceptance. The TSI's Proposal shall include a preliminary event driven Project Schedule, which shall be updated, and resource loaded following NTP to baseline the schedule by including unknowns and any changes during negotiation. All subsequent schedule updates shall be made to the revised baseline for the duration of the Project. The TSI shall submit the Project Schedule in accordance with Appendix K – Project Deliverables Schedule and shall update and make available to NET

RMA the Project schedule on a monthly basis and submit the updated version as part of the monthly progress report.

The Project schedule shall include activity start dates and durations, milestones dates, predecessor and successor dependencies, resources by name, and a critical path representing activities without any slack. The Project schedule shall provide for NET RMA documentation/deliverable review cycles of no fewer than five (5) business days for most deliverables and no fewer than 15 business days for major documents, such as requirements documentation (e.g., System Requirements Document (SRD), design documents, Interface Control Documents (ICDs), test plans including test procedures, and any submittals over 100 pages).

A Project schedule of documentation deliverables shall include a spreadsheet updated weekly for submittals in a two week look ahead, and in real time for submittals sent to NET RMA or received from NET RMA. The project schedule shall reflect each document submittal in whole and in sections as agreed upon for NET RMA review.

At least monthly, the Project schedule shall be submitted to NET RMA in MS Project format with a PDF file and associated narrative with the following updates:

- 1) Completion status of all tasks, activities, and milestones (e.g., deliverable submittal, Project review meeting).
- 2) All task activities shall be resource loaded by name and resource reports generated to demonstrate staff is not over allocated across all tasks.
- 3) Identification of tasks, activities, or milestones that are behind schedule. For example, if preparation of a deliverable has expended 60% of the scheduled completion time while the completion percentage is only at 50%, then this deliverable is behind schedule. Delays for critical path tasks and activities for which a recovery schedule cannot prevent a Project completion delay shall be included in a risk matrix/register with a mitigation strategy. Near Critical Path analysis shall be accomplished as well.
- 4) Project schedule update files shall be version controlled.

All pre-deployment, deployment, and post-deployment tasks for the Implementation Plan schedule shall include at a minimum:

- 1) WBS number
- 2) WBS name
- 3) Resources performing the task activity
- 4) Subsystem affected
- 5) Task duration (includes start to finish of activities to complete task)
- 6) Planned vs. actual time at the start of the task

### 3.10.1.5 RISK MANAGEMENT

The Project Management Plan shall describe the risk management method the TSI shall implement to identify, track and mitigate areas of Project risk, including cost. Concerns that shall be tracked over the course of the Project include the occurrence of certain events with assigned and described risk probability, impact, and mitigation (e.g., elimination, contingency, reduction). A special risk planning session shall be initiated by the TSI at least five (5) months prior to go-live to include the following deliverables:

- 1) Identify all high-risk events which could occur as part of the deployment in terms of data migration, transitioning co-located equipment and devices, transaction processing and historical data retrieval and reporting.
- 2) Produce queries which seek to identify any occurrence of the high-risk items identified in item 1.
- 3) At pre-defined intervals, review reports and queries for validity and notify responsible TSI resources for immediate issue assessment if results are invalid. NET RMA assigned distribution list shall receive status reports of the results generated and sent daily, during a defined time period (e.g., four (4) weeks) immediately after going live.

### 3.10.2 QUALITY ASSURANCE/CONTROL PROGRAM

The TSI shall establish, maintain and follow an effective Quality Assurance/Quality Control Program (QA/QC Program) to ensure adequate conformance to requirements and quality delivery of all Project deliverables and tasks, including design, development, fabrication, processing, assembly, inspection, test, training, maintenance, packaging, shipping, storage, site preparation and installation.

The QA/QC Program shall be overseen by a QA/QC Manager who reports at an organizational level above the TSI's Project Manager, or outside of the Project Manager's direct staff.

The QA/QC Program shall be documented as part of a Quality Management Plan, which shall describe the processes and procedures instituted by the TSI to ensure the QA/QC Program is used as an integral part of the Project.

All supplies, equipment, devices, hardware, software and other services delivered as part of the Contract, whether manufactured or performed within the TSI's plant or at any other source, shall be controlled at all points necessary to ensure conformance to the Contract specifications. The QA/QC Program shall focus on the prevention and early detection and correction of discrepancies.

TSI's QA/QC Program shall provide control and tracking of purchased materials and subcontracted work. TSI shall ensure conformance of all supplies, components, developmental tools, assemblies, subassemblies and services procured from sub-contractors and vendors to the requirements contained herein. The TSI shall also establish procedures for the selection of qualified, reputable and financially secure suppliers and sub-contractors and take responsibility for controlling the quality of the supplies and services provided.

The QA/QC Program shall include a system of problem and issue logging and tracking, follow-up tracking, and final disposition tracking during the Design, Development, Testing and Implementation Phases of the Project. The QC process shall ensure accurate problem or issue description and recording, assignment of personnel, tracking of progress for corrections/revisions, and regression testing, as applicable. The TSI shall use a fully integrated problem or issue tracking tool that includes a reporting capability.

### 3.10.2.1 CHANGE CONTROL AND CONFIGURATION MANAGEMENT

TSI shall propose an internal change control process as part of their Quality Management Plan. Once approved by NET RMA, the change control process shall be instituted and utilized throughout the life of the Project.

TSI shall use proven configuration management tools and techniques throughout the Project to track and control versions of hardware, COTS software products, and customized software. The TSI's documentation shall be controlled through a configuration management system that tracks changes to documents and controls configuration release and version numbering.

On an annual basis, the TSI shall ensure that all COTS software remains supported by its original manufacturer. The TSI shall also update system software and hardware to support any changes in third-party interface communications (i.e., ICD) and industry standards. If the end of support is announced for any installed COTS software products, TSI shall make the necessary changes to support a replacement COTS product that shall be supported for at least the duration of the Contract. If there are modifications to industry standards that warrant addressing to maintain required security, communication, safety and performance, the TSI shall immediately notify NET RMA and shall propose an update or replacement equal or better to the current COTS product or custom software. This replacement plan shall include a schedule and testing prior to migration to the new product.

Once any portion of the proposed System is placed into operational service, the TSI shall not change or replace any production hardware or software without written approval from NET RMA. Any such approved changes shall be documented as part of the configuration management process. The TSI shall provide and maintain specific change and release management plans reflecting the methodologies for the approval and release of any subsystem changes including simple configuration changes or hard code changes.

## 3.11 PROJECT DOCUMENTATION

All Project documentation deliverables must conform to providing no more than three (3) documents to NET RMA for review and approval at any one time. TSI shall maintain a simple spreadsheet tracking tool that is posted in an accessible location to NET RMA. This spreadsheet shall be updated weekly for submittals in a two week look ahead, and in real time for submittals sent to NET RMA or received from NET RMA.

### 3.11.1 REQUIREMENTS TRACEABILITY MATRIX

The TSI shall prepare and submit a Requirements Traceability Matrix (RTM) during the System Requirements and Design Phase of the Project. The RTM shall document, at a minimum, all requirements as described herein with a unique ID and unchanging number, the intended primary and secondary (if any) means used to verify the requirement (i.e., inspection (I), analysis (A), demonstration (D) or test (T)), the uniquely identified test procedure or script number used to verify a requirement, and the date verified (to be used during testing and verification).

The RTM shall trace verification of all requirements contained in the RFP back to their source (e.g., RFP, or Business Rule, or via discovery) and forward to their design element and eventual test cases.

The RTM shall include at a minimum, the following elements:

- 1) RFP section numbers for each requirement (to lowest level section)
- 2) Derived requirements from NET RMA's Business Rules that cannot be linked to RFP System requirement
- 3) Engineering requirements derived from RFP requirements that results in a testable set of requirements
- 4) Design elements contained in the SDDD (to lowest level section)
- 5) Verification method
- 6) Test cases as applicable per verification method
- 7) Training modules as applicable
- 8) The RTM shall be maintained as part of change control for the duration of the Contract. In this way, a change order or defect/deficiency fix or repair could result in changes to other components or system elements and therefore require an update to the RTM. After system acceptance, any changes to the RTM shall be provided to NET RMA for approval.

TSI may include additional tracing elements information in the RTM to assure all requirements are accounted for as part of the Design and Development Phases prior to commencing system testing.

### 3.11.2 DETAILED DESIGN DOCUMENTS

As part of the Design Phase of the Project, the TSI shall submit an SDDD that provides the proposed system architecture, design specifications of all equipment, hardware, and communications/networks gear and a description of the software functionality, and associated data flow. The development of the SDDD shall begin with a thorough discovery process for capturing and updating all applicable NET RMA Business Rules and requirements. NET RMA Business Rules can be found in APPENDIX H. Proposed items and equipment shall meet electrical, communication and environmental requirements and shall be compatible with expected loads, exposure and peak usage. Software design shall describe the various modules intended to provide functionality and processing as is required by NET RMA.

The SDDD shall present the logical design of the ETCS including data flow diagrams for various processing queues, entity relationship diagrams and data dictionary. A Sample SDDD shall first be

submitted with the Proposal in draft form. During the Design Phase of the Project, the TSI's draft submission will be followed by an initial review and comment period, after which design reviews will take place. Upon completion of design reviews, the SDDD shall be revised and re-submitted to NET RMA for final review and approval.

The SDDD shall include at least the following:

- 1) The specification sheets for all equipment including full hardware manual set for all COTS hardware and compliance matrix relative to requirements
- 2) Full description for all COTS software including software manual sets
- 3) Computer/server sizing and design details
- 4) System, subsystem and module level descriptions and interaction between modules
- 5) Business Rules
- 6) The requirements for all peripheral device interfaces
- 7) Preliminary report samples and formats
- 8) Description of system diagnostics, status monitoring and error handling
- 9) Description of redundancy and failover processes
- 10) Interface Control Documents (ICDs)
- 11) File and transaction and maintenance message formats
- 12) User interface design including menus and screens
- 13) Database design including entity relationship modeling and data dictionary
- 14) Data communications/network diagram highlighting proposed changes and interconnection points
- 15) Estimated data communication load and existing bandwidth capacity

The TSI shall provide cut sheets for all equipment that is provided for the ETCS, and, where cut sheets are not available, links to web sites with product details, specifications and requirements shall be provided.

The TSI shall submit the as-built SDDD, including all changes made during the software development, installation and testing phases in accordance with Appendix K – Project Deliverables Schedule.

### 3.11.3 IMPLEMENTATION PLAN

The Project Implementation Plan shall include the following and shall be subject to NET RMA's review and approval including the go-live date and date/times of any service outages or degradation:

- 1) **Transition tasks and activities:** Includes all activities and deliverables for transitioning from the current legacy Zone controllers and TFH, including DR site, to the proposed roadside and TFH System. This includes general communications, coordination with NET RMA's communications office, coordination with the existing maintenance TSI and other NET RMA contractors, being aware of the current operating condition of all affected subsystems just before scheduled transition, and completion of subsystem training particularly related to handling maintenance

alert/alarms. This Plan should include tasks and deliverables which are many weeks or even months in advance of the cut over date.

- 2) **Pre-deployment tasks:** Includes tasks and deliverables that are required for a clean and successful cut-over and go-live, but that may precede the actual deployment by a few days or weeks. This is typically where checklists are reviewed, resources are re-confirmed, advance notices of outages are communicated, and where agreements on formal roles and responsibilities are documented.
- 3) **Deployment tasks:** These are the actual go-live tasks that are performed for the implementation, usually starting 24 to 48 hours prior to go-live. The Work Breakdown Structure (WBS) for the transition task shall include the activities of the involved parties.
- 4) **Post deployment tasks:** These are all the quality monitoring and production verification tasks post go-live to ensure all systems are operating efficiently and as expected and data is accurately mapped to the proposed TFH. The incident management procedures for go live shall be included in this section of the plan. These procedures shall include a daily report of all open incidents/tickets since go-live, their status and next steps to resolve, escalation procedures, and how NET RMA and its consultants will have access and monitoring capabilities during post deployment. The TSI shall propose a post implementation support period for up to a maximum of 4 weeks. This post deployment period shall include additional TSI resources to monitor the system 24/7, report and communicate degradation in addition to MOMS incidents, and resolve problems. If there are still critical system deficiencies after 4 weeks, NET RMA may extend this period until all critical items are resolved.

## 3.12 TRAINING PROGRAM

### 3.12.1 GENERAL TRAINING REQUIREMENTS

The TSI shall provide training designed to educate NET RMA-designated personnel in the operation, use and maintenance of the ETCS. A training course and materials shall be designed to support training during the implementation phase.

NET RMA will provide a facility for conducting the training session. The TSI shall make reservations for any use of NET RMA training rooms, two (2) weeks in advance. The training session can only be conducted between the hours of 9:00 a.m. to 3:00 p.m. Monday through Friday. The TSI shall plan the training course, content, and resources such that up to six (6) trainees could be trained at once. The TSI shall bring their own training equipment; such as, projectors and laptops.

The TSI shall be responsible for building, configuring, and maintaining for the life of the contract a training environment with the latest version of current production software and configuration. The training environment shall be configured with appropriate connectivity (database, third-party interfaces and otherwise), applications, files and data. Training environment application and database updates and refreshers shall be performed within 24 hours of any change to the ETCS.



### 3.12.1.1 TRAINING COURSE

The TSI shall provide and Systems Operations training course for NET RMA's staff.

This course is targeted for NET RMA staff and operations personnel and provides an in-depth knowledge of the operations aspects of the system including, but not limited to report generation, transaction flow, file downloads, operations, performance, alarms, and audits. A glossary of all relevant terms shall be provided in the training. The course shall be conducted (at a minimum):

- 1) Not less than fifteen (15) days after the TFH is installed
- 2) Not less than thirty (30) days prior to integration test
- 3) As necessary to meet the needs of attendees

The course shall provide information on:

- 1) TFH System, Interfaces, Reporting
- 2) Electronic Toll Collection (Roadside)
- 3) DVAS subsystem (if delivered)
- 4) Audit and Reconciliation
  - A. Include step-by-step process on how to audit transactions, from initial receipt of transaction to reconciliation of the transaction.
  - B. Include a list of all reports as well as a reports matrix that shall be used to reconcile transactions cradle to grave. This includes all system generated reports descriptions and purpose.

### 3.12.2 SYSTEM USER MANUAL

TSI's training shall include a system user manual designed to provide users with the information necessary to perform their work as it relates to the proposed ETCS. This user manual shall be clearly written, provide a logical system-oriented organization, and content that incorporates a full range of diagrams, illustrations, graphics, screenshots, tables, and instructions required to perform supported functions. This manual shall be provided in both hard copy and electronic format.

The TSI shall make appropriate updates to all manuals at the conclusion of the System Acceptance Test (SAT).

The system user manual shall include the following (at a minimum):

- 1) Roadside Systems description and operations
- 2) TFH functionality and operations
- 3) Transaction Audit functionality
- 4) Reports listing, reports criteria selection and reports generation



All training course content, training materials and documentation (user manual) shall be reviewed and updated as needed to stay current as part of any change orders and as part of maintenance of the RTM. Any changes or purging of training content shall be pre-approved by NET RMA.

### 3.13 TESTING

#### 3.13.1 GENERAL REQUIREMENTS

The TSI shall conduct testing of the ETCS to validate functionality, availability, reliability, accuracy and compliance to the requirements of this RFP or any changes to requirements due to change orders or break/fix activities. This includes all functionality delivered by the proposed ETCS and all third-party components. This section details the testing requirements, phases, facilities, and support services necessary to test the ETCS and all associated interfaces.

The TSI shall conduct internal tests of the ETCS and interfaces (dry runs) following approved test plans and procedures prior to NET RMA's observation of formal test phases. Dry run testing shall include the execution of all NET RMA approved test cases/procedures/scenarios and shall be executed in back to back fashion such that the TSI can understand how long NET RMA observed Factory Acceptance Testing (FAT) will take. The TSI shall provide the results of these FAT dry runs to NET RMA, prior to commencement of the formal and observed FAT. NET RMA may require the TSI to re-run the internal dry run tests prior to conducting a formal and observed FAT if the preliminary test results do not indicate the test would be passed per the test plan and procedures.

The TSI shall document by way of an issues list all defects and issues discovered during formal and observed test phases. All issues and defects shall be assigned a resolution date and severity level as is described by the TSI's Master Test Plan. This issues list shall be provided to NET RMA within two (2) days of completion of the formal test phase. The TSI shall be responsible for tracking all defects and issues found during all testing phases until complete resolution is reached with NET RMA's approval. NET RMA may require that updates to this issue list be submitted to NET RMA and software demos performed to verify that the updates have been completed. All defects must be fixed, tested, and resolved to NET RMA's satisfaction in each formal test phase before moving onto the next phase of testing or final system acceptance. At NET RMA's sole discretion, it may allow some minor defects to be scheduled for resolution after the completion of a formal test phase.

The TSI shall maintain and have readily available a test environment operating the current ETCS (primarily the TFH) production software version for the duration of the contract, including the following (minimum):

- 1) Change order deployment and demonstration
- 2) Defect triage and break-fix
- 3) Toll Interoperability changes
- 4) Third party interface testing

- 5) Pre-production or “stage” testing: any system testing which requires the current production configuration and software/firmware releases

### 3.13.2 MASTER TEST PLAN

The TSI shall submit a Master Test Plan to NET RMA for review, comment and approval. This Master Test Plan shall provide the standards for developing individual test plans and procedures for the different phases of formal testing. These standards shall describe how each formal test shall be conducted, address test procedure format, discrepancy/issue/defect severity level definitions, discrepancy/issue/defect tracking, and acceptance criteria for each test phase. In addition, the Master Test Plan shall describe the entry criteria that must be met before each formal test can be started and the exit criteria that must be met before each formal test can be considered complete. NET RMA must approve entry and exit criteria for all test phases. All functionality delivered by the ETCS shall be demonstrated/tested, and the Master Test Plan shall describe these demonstrations and guidelines for creating test procedures in the individual test plans. The Master Test Plan shall describe the overall testing strategy and test procedure standards, whereas each formal test shall have its own test plan comprised of detailed test cases and procedures.

It is anticipated that as design and development activities take place, testing strategies and plans may change and require revisions. As such, over the duration of the Implementation Phase, updated versions of the Master Test Plan and related test documents (individual test plans and final test reports) shall be revised or appended to the Master Test Plan and delivered to NET RMA for review and approval. In this way the Master Test Plan can stand as a record of all testing performed during the implementation phase. After System Acceptance, system testing shall be managed as part of the TSI’s Quality Management Plan (Change Control/Management) which shall address QA testing and regression testing to verify changes to the ETCS, including equipment, hardware, application, database, operating systems, COTS upgrades, and all types of patching.

Formal tests shall conform to the standards defined in the Master Test Plan. For formal tests that require test cases (FAT, Commission and Integration testing at a minimum), such test cases shall include the following elements:

- 1) Introduction:
  - A. Test Purpose
  - B. Test Platform (including required equipment, environmental resources, and connectivity)
  - C. Requirements to be demonstrated (cross reference to lowest level requirement)
  - D. Time Estimate
  - E. Pre-requisites
  - F. Set-up and test data preparation needed
- 2) Individual Test Conditions/Steps:
  - A. Test Condition Identifier (i.e., reference to requirement)
  - B. Description of steps to execute the test case
  - C. Expected Results

- D. Actual Results and party responsible for executing the test (entered after test execution)
- E. Notes

As test cases for specific formal tests are developed, they shall be submitted to NET RMA for review, comment and approval. Once approved, the test cases (and later the results) shall be added to the Master Test Plan as addendums.

### 3.13.2.1 TEST REPORTS

The following progress report format shall be submitted daily by the TSI to NET RMA for FAT and weekly for Integration testing:

- 1) Total test cases
- 2) Total test cases closed (% complete)
- 3) Total defects opened
- 4) Total defects closed
- 5) Remaining open defects by priority
- 6) Total test cases exercised this reporting period (by resource name)
- 7) Total test cases closed this reporting period
- 8) Total defects opened this reporting period
- 9) Total defects closed this reporting period

Within ten (10) days following the completion of each formal test, the TSI shall submit a Test Report to NET RMA for review and approval. The Test Report shall describe:

- 1) Results of the test
- 2) Listing of all defects identified along with the severity level of each defect
- 3) Plan for resolving open defects
- 4) Recommendation for retests (if appropriate).

The final approved test report for each formal test shall also be added to the Master Test Plan. NET RMA reserves the right to withhold approval and any associated payments pending completion of corrective action and any necessary retests.

### 3.13.3 FORMAL TEST PHASES

In addition to any internal testing (QA, unit level, or dry-run testing), the TSI shall demonstrate to NET RMA that the ETCS meets functional, technical, operational, performance, reliability, maintainability and availability requirements by executing the following formal tests, which are further described in the sections that follow:

- 1) Factory Acceptance Test
- 2) Installation/Commissioning Testing (at each gantry/location)
- 3) System Integration Test
- 4) System Acceptance Test

### 3.13.4 FACTORY ACCEPTANCE TEST

The TSI shall conduct a Factory Acceptance Test (FAT) to demonstrate that all requirements and functionality have been incorporated into the ETCS. FAT shall demonstrate to NET RMA the full functionality of the ETCS operating in a test environment with hardware and software representative of the final system including transaction volumes representative of twice the expected real-world load on the system. NET RMA will observe the formal FAT on-site. NET RMA and NET RMA-designated representatives shall have access to all FAT test sites and data generated during this testing.

All ETCS functionality including roadside, TFH, capacity/performance, interfaces, ease of use (GUIs), and reports shall be tested/demonstrated during FAT. Internal and external interfaces shall be observed and verified against requirements and for data accuracy.

The TSI shall work with NET RMA's existing vendors and integrators to establish appropriate test conditions such that complete fidelity in a test environment is achieved.

FAT shall also include test procedures for stress testing to verify the system can handle the estimated transactional volumes exchanged (bi-directional if required by ICD) via each interface. Normal and exception scenarios/transactions shall be demonstrated. Twice the daily production load for each internal or external interface shall be successfully demonstrated.

If any portion of FAT requires repeated restarts due to no fault of NET RMA, the TSI may be held accountable for any costs incurred by NET RMA to support any additional system acceptance testing period(s).

#### 3.13.4.1 FAT PLAN AND PROCEDURES

The TSI shall develop a FAT Plan including test cases and procedures designed to demonstrate all functionality and requirements of the fully operational ETCS operating in a factory/test environment. The TSI shall submit the FAT Plan and procedures to NET RMA for review, comment and approval. The FAT Plan shall include a schedule that includes a day-by-day breakdown of the different sub-systems, modules, and interfaces to be tested. The FAT Plan shall include the conditions to be tested along with the expected results, a description of test data sets used for both reports and functional testing, and a description of the priority levels used for classifying and recording any defects noted during FAT.

#### 3.13.4.2 FAT HARDWARE AND INFRASTRUCTURE INSTALLATION TEST (CHECKLIST)

The TSI shall provide an installation verification/checklist document to NET RMA for use in verifying that all installed system components (hardware) match appropriate design documentation for FAT. NET RMA shall be provided this checklist for review before the start of FAT, and FAT cannot begin without its verification against all equipment installed/configured for FAT. This installation checklist verification can be conducted/observed, if desired, as the first step in FAT.

### 3.13.4.3 FAT REPORT AND APPROVAL

Following the FAT, the TSI shall submit a FAT report to NET RMA that describes test results including all issues/defects found along with the severity level of each. If NET RMA deems the number or effect of the items that were unsuccessful to be too large or too severe, the TSI may be instructed to resolve the unsuccessful items, rerun the applicable portion of the FAT, or rerun the entire FAT at the sole discretion of NET RMA.

FAT approval is dependent on successful demonstration of the complete ETCS as functionally compliant with all requirements and as meeting the exit criteria identified in the Master Test Plan/FAT Plan.

### 3.13.5 SITE INSTALLATION/COMMISSION TESTING

Installation/Commission Testing is comprised of verifying, by means of a site verification checklist and infrastructure test report, that all roadside system components are correctly installed and ready for revenue collection. This includes communications infrastructure, networking, and connectivity back to the TFH. NET RMA or NET RMA designated resources may observe installation/commissioning testing.

All hardware, peripheral devices, network equipment, and other infrastructure for the project must be tested and verified as operating as designed by submission of an installation test report. This installation test report shall be submitted to NET RMA and shall contain the following (minimum):

- 1) Test date
- 2) Location
- 3) Test steps/procedures executed
- 4) Any special configuration instructions that had to be followed to complete installation
- 5) Tester's name and signature
- 6) Test results

The TSI shall describe in the Master Test Plan how they will utilize the combination of the required installation checklists, installation test reports, live traffic, and any controlled test cases to determine the exit criteria for each lane's commissioning.

### 3.13.6 SYSTEM INTEGRATION TEST

System Integration Testing is an end-to-end test to verify all ETCS components and interfaces meet functional and performance requirements. System integration testing is to be performed in a production ready hardware, equipment, network and connectivity configuration. This includes connectivity to the CTRMA Host system. For any controlled testing during this phase, previous test procedures from FAT can be reused if appropriate and approved by NET RMA. As this test may include participation with third parties, the planning for this test and needed support from NET RMA for coordination with the third parties shall commence just after NTP. This is the final end-to-end test of all ETCS functionality and shall indicate the ETCS's readiness for operations and revenue collection.

The TSI shall provide all effort needed for ETCS connectivity to the CTRMA Hub and any associated network configuration and testing.

The System Integration Test shall be conducted with all equipment, devices and hardware integrated as a System. Test entry conditions include the following:

- 1) All lane equipment shall be installed in its final production location
- 2) All software shall be configured for production
- 3) All interacting subsystems required for the test have been connected
- 4) All interfaces shall be complete and all coordination with other participants, shall be complete prior to beginning this test at scheduled test locations

### 3.13.6.1 SYSTEM INTEGRATION TEST PLAN AND PROCEDURES

The TSI shall provide an Integration Test Plan including all test cases and test procedures to NET RMA for approval. Significant detail regarding the preparation, structure, and reuse of test data for each of the interfaces shall be included in the Plan. Additionally, similar to FAT, the System Integration Test shall include performance testing with simulated transaction volumes representative of twice the expected real-world load on the system.

The Integration Test Plan shall include test cases and test procedures designed to demonstrate all user functionality of the fully operational ETCS operating in a production configuration. Significant detail shall be provided in the Plan for how test data will be prepared and utilized, how summary and detail level reports are intended to be reconciled, which reports are intended to be reconciled with others, and the process for proving revenue reconciliation reports are accurate. Testing of all reports and other GUI functionality for the ETCS shall be performed during Integration Testing. All reports shall be thoroughly vetted and internally tested by the TSI prior to the start of Integration Testing.

### 3.13.7 SYSTEM ACCEPTANCE TEST

System Acceptance Test (SAT) shall be conducted over a period of thirty (30) consecutive days with the fully implemented ETCS utilized by NET RMA for the Toll 49 facility. SAT shall demonstrate all required availability, accuracy, performance and system response requirements are met by the ETCS. An entry criterion to SAT is that the ETCS is meeting or exceeding all functionality requirements as demonstrated during FAT, Commissioning, and System Integration Testing, and all SLAs are being met. During SAT, the TSI shall demonstrate all SLAs are being met by way of the SLA reporting requirements described in APPENDIX E Service Level Agreement. NET RMA shall have access to all data sets and reports used by the TSI to demonstrate compliance with the SLAs during SAT.

The TSI is solely responsible for executing SAT and recording the results to include weekly status reports. However, at its discretion, NET RMA may observe and report defects during SAT.

If any portion of SAT requires repeated restarts due to no fault of NET RMA, the TSI may be held accountable for any costs incurred by NET RMA to support any additional system acceptance testing period(s).

The TSI will be given Project Acceptance for the ETCS upon the successful completion and NET RMA approval of SAT, closure of all punch-list items, completion and submission of all required documents including as-builts and updates to manuals, and meeting of other conditions as specified in the Contract Documents.

### 3.13.7.1 SYSTEM ACCEPTANCE TEST PLAN

The TSI shall provide a System Acceptance Test (SAT) Plan which includes the specific procedures that will be used to demonstrate that the implemented ETCS meets all SLAs. The SAT Plan shall:

- a) Describe all entry and exit criteria.
- b) Include sample reports that may be used to demonstrate system availability, accuracy and performance.
- c) Describe procedures for halting and re-starting SAT including the triage, testing and full resolution of any high severity defects.
- d) Describe the process for correcting all defects/issues found during SAT, and the regression testing required to implement the corrections.

### 3.13.7.2 SYSTEM ACCEPTANCE TEST REPORT

Following the System Acceptance testing, the TSI shall submit a System Acceptance Test report to NET RMA describing the test results including all issues/defects found along with the severity level of each.

System Acceptance test approval is dependent on successful demonstration of the complete ETCS as functionally compliant with all requirements and as meeting the exit criteria identified in the Master Test Plan/System Integration Test Plan.

### 3.13.7.3 AS-BUILT DRAWINGS

Upon final acceptance of the system, all project related drawings and documentation that have been used in the implementation effort will be updated to reflect the delivered system design and configuration. NET RMA will review the delivered as-builts which, upon approval, will reflect the final deliverable for implementation. It is assumed that the update process for the as-built package will run concurrent to project delivery and therefore result in final delivery in accordance with the deliverable schedule, Appendix K Project Deliverable Schedule.

### 3.14 MAINTENANCE

#### 3.14.1 GENERAL REQUIREMENTS

The TSI shall provide all necessary maintenance services to support all hardware, software and network on the Toll 49 facility ETCS. In addition, the TSI shall maintain all LAN and WAN network equipment provided by NET RMA and installed and configured by the TSI. The Toll 49 ETCS and associated systems and equipment shall include, at least, all hardware and software associated with the following:

- 1) Lane Controllers
- 2) AVI Systems (excluding transponders)
- 3) AVC Equipment and System
- 4) AVD Equipment and System
- 5) VES System
- 6) All electronics in the roadside equipment cabinets
- 7) All network equipment and cables, including the roadside Fiber Optic Network. AT&T will maintain the network; however, the TSI shall be responsible for monitoring and notifying AT&T if outages or issues occur.
- 8) Roadside equipment cabinets and associated electronics
- 9) Equipment mounting and brackets
- 10) UPS Systems
- 11) Lane equipment needed for ongoing development and test support
- 12) All TFH related servers and equipment

The TSI shall provide maintenance services in accordance with the Maintenance Response and Repair Times described in Table 3: Maintenance Response and Repair Times for the duration of the warranty and maintenance period. On-site and off-site services shall be provided. The TSI shall provide full time remote Help Desk support services to assist in troubleshooting, and incident/case management for identified software and system issues.

*Table 3: Maintenance Response and Repair Times*

NET RMA Priority Level	ROMS Ticket Severity Response	Response Time	Repair Time
Priority 1	Emergency	30 Min	1 Day
Priority 2	Critical, Error	30 Min	1 Week
Priority 3	Alert, Notice, Info, Warning	30 Min	1 Month
Non-Priority	Maintenance, Debug	N/A	N/A





*Table 4: Priority Level Definitions*

NETRMA Priority Level	Definition
Priority 1	A Priority 1 Maintenance Event is defined as any malfunction or fault that will result in the loss of revenue and/or hazard to personnel.
Priority 2	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.
Priority 3	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.
Non-Priority	A Non-Priority issue is indicative of preventative or predictive maintenance and is typically opened by maintenance staff.

TSI shall conduct a bi-weekly maintenance meeting with NET RMA to report operating performance, equipment/system problems and proposed solutions.

TSI shall conduct a monthly status meeting with NET RMA to review the monthly Maintenance Online Management System (MOMS) report, the previous month's work, anticipated work for the next month, and any operational problems that have arisen or are expected. During the monthly status meetings, the TSI shall identify and communicate to NET RMA all issues affecting the operations or performance of the ETCS. TSI shall complete root cause analysis and after-action reporting. TSI shall present how issues arose, were identified and resolved.

TSI shall establish and maintain a dedicated maintenance warehouse for this project. This shall serve as the primary location for warehouse/storage of any spare parts, consumables, tools, test equipment, repair parts, documentation and personnel needed to manage and support the ETCS.

TSI shall provide adequate safeguards against theft, damage, or loss of NET RMA spare parts in TSI possession. TSI shall be responsible for maintaining insurance against loss or damage to the spare parts due to mishandling, improper storage, theft, etc.

The warranty phase shall commence upon go-live (the beginning of revenue collection) and shall include all maintenance and production support for the ETCS. The Warranty Phase shall conclude either after twelve (12) months or upon successful completion of the System Acceptance Test as described in Section 3.13.7 of this RFP, whichever occurs later. The maintenance period shall begin at the completion of the warranty period. The TSI shall ensure that the costs for the warranty and subsequent years of maintenance and production support are separated into individual pricing components in the Pricing Forms in APPENDIX D Cost Proposal.

The one-year Warranty period shall include all maintenance and production support for the first year of operation.

### 3.14.2 MAINTENANCE PLAN

The Maintenance Plan shall include all processes and procedures used to successfully manage, staff and conduct ETCS maintenance in accordance with all the requirements set forth in this RFP. The Plan shall address the following, at a minimum:

- 1) A description of the maintenance methodology and approach
- 2) Organizational Chart and staffing schedules
- 3) Maintenance regions (if they exist) and staff assignments
- 4) Specialized tools (if required)
- 5) A description of the MOMS and any other methods that shall be used to monitor the Toll 49 ETCS, including priority levels for response to alarms, paging protocol and sample reports and screens
- 6) A schedule and description of Emergency/Corrective, predictive, and preventive maintenance activities for all system components
- 7) Contracted maintenance relationships (any TSI teaming agreements or arrangements must be reviewed and approved by NET RMA to ensure specific requirement and expectations are met)
- 8) Maintenance support groups
- 9) Personnel contact information
- 10) Staff locations
- 11) Staff qualifications
- 12) Description of the Staff training
- 13) Maintenance facilities/workshops
- 14) Procedures to be used for planning and implementing lane closures
- 15) Description of maintenance activities that may need to be executed during peak traffic periods, including how this will affect response time and how traffic management will be performed
- 16) Maintenance record keeping
- 17) Failure tracking and corrective action
- 18) Reliability and maintainability analysis and calculations
- 19) Maintenance activity reports

This Maintenance Plan shall describe routine, preventive and corrective maintenance along with maintenance repair procedures and checklists. The Maintenance Plan shall describe how the functionality of the MOMS is used to identify, dispatch, respond, restore and record an incident or service event. Maintenance response times shall be as specified by the SLAs, and the Plan shall communicate the TSI's processes to meet these response times. Spare parts inventory management shall be addressed.

TSI shall update the Maintenance Plan on a yearly basis to reflect any new operational practices and newly installed hardware/software that may affect TSI's maintenance activities.

### 3.14.3 MONTHLY MAINTENANCE REPORT

Beginning at the end of the first full month after Go-Live, TSI shall submit a Monthly Maintenance Report (MMR) for NET RMA's review. MMRs shall include, but not be limited to the following data:

- 1) Monthly Performance Measurements for all defined SLAs
- 2) Mean time to respond and repair (MTTRR) calculations, including exceptions and justifications
- 3) Access to all reports/data used by the TSI in support of the MMR
- 4) Preventive and predictive maintenance activities performed each month
- 5) Work Orders, including the assigned technicians and associated repair times
- 6) Work Plan for the following month
- 7) Date and results of weekly generator checks.

NET RMA must approve format and content prior to first submittal.

### 3.14.4 MAINTENANCE STAFFING AND LOCATION

As part of the Maintenance Plan, TSI shall identify the number of remote and local software, hardware and network maintenance personnel that will be assigned to each job category including:

- 1) Supervisors
- 2) Network and systems engineers
- 3) Database and systems administrators
- 4) Field staff
- 5) Desktop support

### 3.14.5 TRANSPORTATION

TSI shall provide all necessary and appropriate vehicles to fully support the ETCS. Vehicles shall be equipped with any necessary equipment, machinery, tools, test equipment, spare parts, repair parts, and consumables necessary to perform all tasks, including overhead work.

TSI shall ensure that all field staff assigned to any vehicle requiring a special operator's license are trained and appropriately certified to operate such vehicle.

TSI shall display their company logo and relevant information on maintenance vehicles such that they are easily identifiable.

### 3.14.6 MAINTENANCE METHODOLOGY AND PROCEDURES

#### 3.14.6.1 CORRECTIVE MAINTENANCE

TSI shall perform maintenance activities on a priority basis to detect, isolate and rectify a fault or substantial degradation in functionality of a system in order to restore it to its normal operable state.

Corrective maintenance support shall be provided on a 24-hour, seven (7) days a week, 365 days per year basis.

TSI shall prioritize all ETCS maintenance events based on the potential impact to ETCS performance, operations and the ability to collect revenue.

#### 3.14.6.2 PREVENTIVE MAINTENANCE

TSI's preventive maintenance efforts and activities shall be carried out proactively on a scheduled basis (daily, weekly, monthly, quarterly and annually) to ensure that the ETCS is being maintained to meet the ETCS performance and availability metrics by inspecting, adjusting, cleaning, tuning and maintaining the ETCS components (hardware and software) to aid in preventing future failures.

As part of the Maintenance Plan and on an on-going basis, the TSI shall develop a preventive maintenance schedule (to be approved by the NET RMA), which represents the levels of effort, activities, resources, schedules, etc. required to fulfill the TSI's preventive maintenance responsibilities.

The TSI shall continually evaluate the preventive maintenance schedule based on operational experience gained during the Contract, consult routinely with the NET RMA via reporting and regular meetings, and submit any recommended changes to the NET RMA for approval. In addition, NET RMA may request a revised Preventive Maintenance schedule to ensure that ETCS components continue to function properly. PMs shall be scheduled such that the work will not interfere with peak travel times.

TSI shall enter proposed routine and preventive maintenance work activities in the MOMS, which shall automatically generate alert/alarm messages and work orders tracked by the MOMS.

Preventive Maintenance that will impact ETCS functionality or NET RMA's customers shall be preapproved prior to work starting.

#### 3.14.6.3 WARRANTY MAINTENANCE

TSI shall utilize MOMS to maintain warranty information (e.g., start date, duration, expiration date, responsibilities and obligations of the parties). The MOMS shall generate automated messages when warranties are nearing expiration or when maintenance service is required as a condition of a warranty remaining in effect.

#### 3.14.7 HELP DESK

TSI shall provide help desk staffing during the hours of 7 a.m. to 7 p.m. Monday thru Friday in support of NET RMA's hours of operation (M - F 5:30 AM – 8:30 PM). In addition, the TSI shall provide after-hours on-call telephone number and email address support for resolution of issues noted by NET RMA staff. The help desk is intended to act as a central point of contact for all technical support, including hardware and software support, installation of updated versions of software, networking, network connection requests, and troubleshooting.

### 3.14.8 SPARES AND ASSET MANAGEMENT

The TSI shall purchase and maintain the spare parts and consumables inventory as agreed to and approved by NET RMA. The TSI shall recommend quantities for all spare parts supplied for the Project. The spare parts list shall also be included in the Maintenance Plan. The initial spare parts inventory for the Project(s) shall be provided by the TSI to be used during the maintenance phase. This spare inventory shall include spares for new equipment procured by TSI and spare inventory transferred from ETCS spare inventory. All items in the spare inventory shall have unit prices provided in the Cost Proposal even if the TSI does not need to procure items for the initial spare inventory. If the TSI elects to utilize the initial spares inventory during warranty, the TSI shall be responsible for funding the replenishment of the inventory levels to their original quantities until the completion of the warranty phase at no additional cost to NET RMA. All spare parts purchased for the Project during the Maintenance Phase (but not including Warranty Phase) shall be procured by the TSI and expensed on the monthly maintenance invoice. The TSI shall obtain NET RMA approval prior to purchasing needed spares. All spares procured shall become the property of NET RMA and shall be labeled as NET RMA property and identified with a bar code or other inventory management process approved by NET RMA. The TSI shall use NET RMA equipment nomenclature when entering spare part information into the spares tracking system(s).

TSI shall perform a full physical inventory audit annually to verify consistency between MOMS inventory management system and the actual count. TSI shall also perform a cycle count on each bin or location at least 3 times per year. MOMS shall have the capability to record the physical inventory, cyclic count details, and update the inventory accordingly with reason for the difference found in the physical inventory count.

TSI shall be responsible for the proper disposal of the any parts and equipment removed from service in accordance with NET RMA requirements. TSI shall obtain approval from NET RMA prior to the disposal of any parts or equipment owned by NET RMA. TSI shall coordinate and document any equipment disposals with NET RMA.

NET RMA reserves the right to independently purchase spare parts and transfer to TSI subject to TSI's inspection and acceptance of the spare parts.

### 3.14.9 AS-BUILT DRAWINGS

The TSI shall provide one (1) complete electronic set of as-built drawings for the ETCS in any "native" file format such as MicroStation, Visio, Excel, and one (1) complete electronic set in a PDF format on read only electronic media. The sets shall include ETCS architecture, all schematics, logic diagrams, layouts, wiring diagrams, assembly drawings, parts detail drawings, and installation. The set of as-built drawings shall consist of a title sheet, an index sheet and the various as-built drawings. The index sheets shall include a listing of all drawings with headings for Drawing Number, Drawing Title, and the type of drawing, such as assembly, schematic, material list, wiring diagram, wire list, or similar categories.

The TSI shall incorporate and re-submit the as-built drawings for any design modifications, change orders and field installation changes that occur during the project. NET RMA will review the as-built drawings for content and will accept the drawings only when the TSI has complied with the requirements set forth herein.

All as-built drawings shall be approved before the beginning of SAT. If at any time during the operations of the ETCS should physical construction or installation be modified for any reason, the TSI shall submit updated as-built drawings within two (2) months of completion of said modification. Completion of physical construction or installation shall be determined on a per facility basis and as-built drawings for the facility shall be deemed due two (2) months after completions of physical construction and installation at that facility.

### 3.14.10 SAFETY PLAN

The TSI shall develop a comprehensive Safety Plan for the Project, which shall be submitted to NET RMA for review, comment and approval in accordance with the deliverable schedule, Appendix K Project Deliverable Schedule. The Safety Plan shall describe the procedures that will be instituted both during system implementation/deployment and during system maintenance activities to ensure personal safety and compliance with all applicable state and federal laws, rules and regulations, and legislation including but not limited to OSHA, NECA, FHWA.

The TSI shall ensure that all personnel working within the Toll 49 facility work areas are trained on the safety program, prior to entrance to any work area and shall always be responsible for the safety of all TSI personnel.

Safety Plan shall be updated yearly as part of the Maintenance Plan.

### 3.14.11 TRAFFIC CONTROL PLAN

TSI shall develop a Traffic Control Plan(s) for the Project, which shall be submitted to NET RMA for review, comment and approval thirty (30) days before any field installation activity commences. The Traffic Control Plan(s) should describe any/all traffic control procedures that shall be instituted both during system implementation/deployment and during system maintenance activities to ensure traffic safety and continued efficient traffic flow. Lane closures will be conducted at night. Traffic Control Plan shall adhere to the Traffic Control Requirements by all local, state and federal agencies.

The TSI shall ensure:

- 1) All personnel working within the Toll 49 facility work areas are trained on the Traffic Control Plan(s)
- 2) Traffic Control Plan shall be updated yearly as part of the Maintenance Plan

### 3.14.12 SECURITY PLAN

The TSI shall provide a Security Plan for the Project, which shall be submitted to NET RMA for review, comment and approval. The Security Plan shall describe personnel, facilities, data and communications security provisions that shall be utilized for the Project(s), including, but not limited to the following:

- 1) Cabinet, hub, facility and housing access
- 2) Electronic Toll Collection System software control including User ID and password protections and system access control
- 3) Data privacy and encryption
- 4) Data communications security
- 5) Virus and spyware protection

### 3.15 MAINTENANCE ONLINE MANAGEMENT SYSTEM

The TSI shall provide an automated standalone MOMS application that allows for monitoring roadside and TFH equipment, tracking and reporting of work orders, alarm messages, equipment inventory and equipment health. The MOMS shall have the ability to support configurable alarm priorities, as well as maintenance personnel tracking, paging and assignments. The MOMS system shall record equipment and process failures such as:

- 1) Reporting and tracking alarm/alert messages
- 2) Notifications to TSI and NET RMA staff
- 3) Logging acknowledgements
- 4) Generate and track work orders
- 5) Maintain Preventive Maintenance schedules
- 6) Generate repair histories
- 7) Maintain parts inventory
- 8) ETCS Asset management
- 9) Track System Availability
- 10) Rapid detection of poor performing cameras

The MOMS shall be an integral part of all maintenance activities including routine preventive, warranty, and corrective maintenance.

At a minimum, MOMS shall be capable of providing the following key functionality:

- 1) Monitor and collect data on the ETCS and equipment status continually 24 hours a day, seven (7) days a week
- 2) Support the assignment of maintenance priority levels based on severity level, facility, day and time
- 3) Track Mean Time Between Failures (MTBF) for all ETCS elements
- 4) Current Toll Point operational status
- 5) Current Facility Host operational status

- 6) Failure, malfunction, and or degradation by location
- 7) General description of failure, malfunction and or degradation
- 8) Automated spare parts inventory entry, tracking (usage and reorder points) and control
- 9) Detailed part and equipment description (including part/model number, serial number, vendor contact information, date entered into system)
- 10) Part and equipment maintenance activity and repair histories
- 11) Automatically generate and track work orders for preventive maintenance, corrective maintenance and emergency maintenance
- 12) Historical subsystem, equipment and component performance information including availability, mean time between failure, average response time, average restore time, percent of actual inventory levels to recommended inventory levels (for items more than a selectable value)

MOMS shall be the repository for work orders and temporary logging of maintenance activities initiated without a work order. MOMS shall support access to stored data using a query by toll zone, hub or off-site location, Work Order status, component or unique Work Order number. Work Order entries shall contain the following types of information, which shall be recorded using standardized terminology and codes where possible:

- 1) Unique Work Order number
- 2) Response and restore time, date, location code
- 3) Model and serial/part number of equipment or software version
- 4) Status updates with time, date, location, component and activity records
- 5) Error and/or event codes associated with the incident or failure event
- 6) Description of work performed (e.g., corrective actions, reconfiguration) and services rendered (e.g., warranty service)
- 7) Name of the maintenance technician(s) who performed the work
- 8) Disposition of the hardware and equipment problem (repaired, replaced, returned to supplier/manufacturer)
- 9) Work Order closure pending specific follow-up actions (e.g., Root Cause Analysis)

Hardware, equipment components, software failures and malfunctions shall be tracked by equipment type and ID number. Component failure rates (i.e., failures/operating hour) or MTBF shall be tracked on a continuous basis and the MOMS shall generate monthly reports showing measured average failure rates and manufacturer advertised or claimed MTBF (as applicable). This information shall be used by the TSI to monitor whether specific items are experiencing unacceptable high failure rates. The TSI shall communicate steps taken to mitigate high failure rates for any equipment. Access to MOMS information shall require entry of the user's identification and password from which the subsystem shall retrieve the user's assigned role(s).

MOMS data shall not be deleted or modified without NET RMA approval.

MOMS shall not allow any user to append the timestamp of an event, including the initial acknowledgement time, response time, and repair times entered by a maintenance staff member



without express permission by NET RMA. If permission is given, an identification as to who did the appending and/or correcting, when it was done, what was done and why it was done must be included.

### 3.15.1 EQUIPMENT STATUS MONITORING AND DIAGNOSTICS

MOMS shall report the status and diagnostic result of all equipment in near real-time. A performance monitoring function shall allow the user to select and observe the status and or performance of several pre-defined portions of the system.

MOMS shall be capable of generating alerts, alarms, and notifications to be sent to a configurable group of recipients. A Single Network Management Protocol shall be used when supported by the equipment being monitored. TSI shall build routines to measure instances of an undesirable state and generate an alarm when an established and configurable threshold is reached. MOMS shall be capable of identifying state changes requiring the automatic generation of a work order and shall dispatch a technician on a schedule consistent with the severity of the state change and the assigned priority level.

### 3.15.2 WORK ORDER GENERATION

A primary purpose and function that the MOMS shall serve is to automate the process of expediting repair/service calls to field maintenance staff. MOMS shall be designed with the ability to generate work orders with little or no human intervention. TSI staff shall have the ability to create work orders manually, enter data regarding maintenance statuses, search work orders based on component or subsystem failures and close work orders. Work order generation shall include the following:

- 1) Generating a minimum of three (3) different work order priorities as defined by NET RMA
- 2) Capability to build ad-hoc work orders for unusual system occurrences
- 3) Formats and specifications as determined by NET RMA
- 4) Work order shall include the following information regardless of final format:
  - A. Date /time of Work Order generation
  - B. Date/time/location of repair or maintenance call
  - C. Work order number (sequential)
  - D. Failure or Malfunction description
- 5) Work order field for failure or malfunction description shall be implemented as a drop-down menu box for purpose of standardized descriptions (approved by NET RMA), which are searchable
- 6) MOMS shall allow the user to schedule one-time or recurring preventive maintenance tasks for a specified duration(s)

### 3.15.3 TECHNICIAN DISPATCH

MOMS shall be capable of automatically dispatching in real time the required support personnel to restore a failed, malfunctioning and or degraded equipment or component item being monitored.

Depending on the severity of the problem or issue, the MOMS shall assign a priority level. MOMS shall be capable of writing the corresponding priority level value to the work order record.

### 3.15.4 WORK ORDER TRACKING

MOMS shall provide the capability for tracking the status of the work orders being generated, processed and closed. This functionality shall be part of the MOMS Dashboard or separate work order management functionality.

TSI staff shall be equipped with portable devices allowing them access to MOMS, enter data remotely and completely manage work orders.

MOMS shall have the ability to determine and calculate initial acknowledgement times, response times (both remote and on-site), repair times and lane and system down time. MOMS shall have the ability to search by and sort on corrective actions taken by the TSI staff to resolve the failure or malfunction. TSI shall not place any MOMS pages into a hold queue unless NET RMA approves, or lane closures are required to service the failed device. Travel times to service a MOMS alert shall be included in the down time calculations.

### 3.15.5 DISPATCH ESCALATION

MOMS shall be capable of escalating a work order that has not been acknowledged by the appropriate technician within a configurable time period of the initial notification. The MOMS shall support building and reading from a table containing IDs of support staff and supervisors for defining the escalation order when a notification response is not received for any event.

### 3.15.6 INFORMATION ENTRY AND CLOSEOUT

A technician's actual arrival time to the site of the maintenance issue or remote log in shall be entered into the work order record along with the time the work is completed. After work is performed, the MOMS shall update the status of the work order along with information entered by the technician describing the event, work performed, and materials used. The work order generation function shall be integrated with the spare parts inventory control subsystem to automatically update the spare parts inventory based on the technician's entry of coded parts used to restore defective items. MOMS shall allow the assigned and responding technician to close out the work order when a status change indicating the item was restored is received by the subsystem.

### 3.15.7 SCHEDULED SERVICES (MANUFACTURER'S WARRANTIES)

MOMS shall utilize manufacturers required maintenance activities and intervals to comply with warranty maintenance requirements such that manufacturer warranties remain valid. The MOMS shall issue an alert at a configurable number of days before expiration of any warranty period entered into the system.

### 3.15.8 SPARE PARTS INVENTORY CONTROL SYSTEM

MOMS shall include an automated spare parts inventory control system for entering, tracking and controlling the movement of spare parts used to maintain the ETCS. The MOMS GUI shall support entry of each equipment item, device, part or component. Entered information shall include part/model number, serial number, primary vendor contact information, alternative vendor contact information, last invoice price for item, last order lead time (order to delivery), and date entered into the system. Spare parts Inventory control system shall be integrated with the work order process to track usage of spare parts, which works in conjunction with the GUI entries to remove spare parts from inventory. MOMS shall be capable of calculating and tracking the current value of the spare parts inventory.

The TSI shall maintain accurate records of all equipment and parts by location as they enter and leave inventory. The TSI shall apply a unique bar code on all equipment. The bar code shall be placed in a readily accessible and uniform area for all similar equipment. The TSI shall provide a sufficient quantity of barcode scanners (three (3) at a minimum) for use by maintenance personnel for direct entry into MOMS of all assets (operational units, spare inventory, test equipment, etc.). Records shall include part numbers, part descriptions, serial numbers, times and dates of changes to location, warranty information, NET RMA nomenclature, and a brief description of the part itself. The following procedures shall be followed during maintenance activities:

- 1) When a part is replaced and determined to be in warranty, the part shall be returned to the manufacturer.
- 2) When a part is replaced and determined to be out of warranty, the part shall be repaired or replaced (whichever is most cost effective) and returned to inventory.
- 3) When a part is not repairable or not serviceable, it shall be recorded in the MOMS inventory as retired. Disposition of retired parts shall be coordinated with NET RMA.

For all repair activities, the details of the repair and the parts disposition, including parts retired, shall be recorded and tracked in the MOMS. The TSI shall provide a safe and secure storage location for all spares and shall bear all risk for loss or damage. The TSI shall provide adequate inventory of miscellaneous maintenance and repair items and consumables.

MOMS shall have the option to move or transfer asset items between NET RMA locations and TSI maintenance staff. MOMS shall track the complete chain of custody for each inventory item from: initial purchase to storage at TSI facility, to dispensing inventory to staff, to installation in field, operation, removal and final disposal.

MOMS automated inventory management system shall automatically generate alerts when asset(s) inventory reaches a configurable threshold and automatically generates purchase order requests based on the low inventory threshold. MOMS shall be capable of collecting and analyzing ETCS component usage data in order to generate forecasted parts and replacement cycles, as well as forecasted purchases for the succeeding eighteen (18) months. The MOMS system shall be capable of maintaining vendor lists for any ETCS assets.

### 3.15.9 MOMS REPORTING

MOMS reporting system shall support the generation of reports in PDF, CSV, and other formats specified. TSI shall provide a MOMS reports matrix.

MOMS shall provide NET RMA read-only access to this subsystem to perform such functions as generating reports, and reviewing details of open work orders, investigating current hardware, equipment and device locations, and reviewing spare parts inventory levels for certain items.

TSI shall coordinate with NET RMA Operations regarding any asset management requests or third-party needs. Unplanned walkthroughs for audits verifications shall be accommodated upon request.

### 3.16 SUCCESSION PLAN

The TSI shall provide a Succession and Transition Plan that shall be executed at the end of the contract, or should the contract end prematurely. This Plan shall define the activities and deliverables for the TSI to turn over all subsystems data, Project assets, and artifacts to NET RMA or a designated third party. The Plan should also include the specifics of how the contract documentation, invoicing, negotiated payment credits, liquidated damages, incomplete work orders and all contractual requirements shall be transitioned to a new vendor should the TSI's company be sold. This Plan would be executed with the objective of a seamless transition with minimal service interruption. A description of a handoff of all operational and maintenance processes and procedures shall be included in the Plan. There shall be minimal interruption in the processing of tolls, financial reporting, and auditing during the cutover period. Neither NET RMA nor the public shall be adversely affected by the ETCS cutover, meaning no lost transactions and no lost access to the ETCS data and reports. The Succession Plan shall be presented to NET RMA by the TSI on an annual basis to include all subsystem operations and maintenance updates from the previous year. The Plan shall address the following tasks, activities, and submittals:

- 1) Proposed TSI and Successor Responsibilities
- 2) Transition Strategy
- 3) Initiate Conversion at Lane Level
- 4) Potential Infrastructure Services Issues
- 5) Potential Equipment Support Structure Issues
- 6) Proposed Data Migration Plan
- 7) Proposed Successor Host Access Security
- 8) Assurance Strategy for Continuous Disaster Recovery
- 9) Risk Matrix with Assessed Probabilities and Mitigation Strategies

The Plan shall include an end of Project checklist verifying all products are the current version and include any executed service contracts. The TSI shall conduct the TSI's assigned activities defined in the Succession Plan at no additional cost to NET RMA.

Source code management shall be a component of the Succession Plan.



## APPENDIX A Glossary

Acceptance	The written approval by NET RMA or NET RMA-Designated Representative of a stage of the Project or the full Project as defined in the Agreement.
Acceptance Testing	Includes each level of testing defined in the Agreement to verify that all requirements of the Agreement as defined in the Project Scope of Work have been met.
Agreement	The Agreement attached as APPENDIX B Contract represents the Agreement between the Contractor (TSI) and NET RMA.
As-Built Drawings	The documents and drawings associated with the Scope of Work.
AVI Transaction	Synonymous with “Tag 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 an Interoperable Home Agency, and (c) has a sufficient account balance at the time of posting or re-posting to pay in full the applicable toll rate.
Business Rules	A set of rules approved by NET RMA that define how NET RMA systems shall respond to various situations that occur during the toll collection process based on business case and policy decisions made by NET RMA.
Contract	The binding Agreement between NET RMA and the Contractor for NET RMA Roadside System Implementation and Maintenance Scope of Work.
Contract Documents	The RFP and any addenda thereto (and any other documents and Exhibits referenced therein), the Contractor’s Proposal (and any documents and Exhibits referenced therein) and any Change Orders and the Agreement.
Customized Hardware	The Toll Collection System hardware provided by the Contractor under the Agreement.
Design Phase	The period in the Project which follows the Requirements Phase, and in which the SDD is developed and submitted to NET RMA for review and approval.
Disaster Recovery Plan	Document detailing the processes and procedures to protect and recover the Information Technology infrastructure in the event of a disaster.



Electronic Toll Tag or Toll Tag or Tag or Transponder	A device that records the usage of a vehicle using a toll road, usually adhered to the windshield of the vehicle, allowing motorists to drive non-stop through designated AET lanes.
Facility	A toll or transit facility.
Final System Acceptance	The written acceptance by NET RMA that the Contractor has provided a System that complies with all requirements and operates to the satisfaction of NET RMA.
Go-Live	The process, phase, or date at which time the new system begins operation.
Guaranteed Completion Date	The dates that the Contractor must meet as defined in the signed Contract, upon approval.
Implementation Phase	The phase of the project involving construction, both physical and software, when the components of the project become visible to others outside the development and construction staff.
Lane	A portion of a roadway within a Toll Zone serving as a permanent single line of vehicular traffic (note this also includes fully instrumented shoulders).
Maintenance Management System	A software application or suite of applications that automates the tracking and reporting of work orders, alarm messages, equipment inventory, equipment health, and interface status.
NET RMA-Designated Representative(s)	Person or persons authorized by NET RMA to represent NET RMA in all dealings with the Contractor.
Plans, Specifications, and Cost	The contract drawings, the compilation of provisions and requirements, and the predicted cost for a project.
Prime Contractor	The single legal entity that enters a contract with a client for delivering Services under a defined scope of work. For purposes of this Toll Systems Integrator RFP, the Prime Contractor will be the pre-qualified Prospective Toll Systems Integrator that executes the contract with NET RMA and is the primary point of contact with NET RMA with respect to the Services being delivered.
Project	The total Work defined in the Scope of Work and the Contract Documents.
Project Acceptance	NET RMA's acceptance of the System after the completion of the Project as defined in the Agreement.



Project Implementation Schedule	The detailed schedule developed and maintained by the Contractor that lists all tasks related to the design, development, testing, installation and deployment of ETCS as defined in the Scope of Work.
Project Management Body of Knowledge	A reference to the contents of the Project Management Institute guide titled <i>A Guide to the Project Management Body of Knowledge</i> , which provides standards, guidelines, rules, and characteristics for project management.
Project Management Plan	The plan developed by the Contractor in response to the RFP in accordance with the Scope of Work and approved by NET RMA, as the same may be amended from time to time by written agreement between NET RMA and the Contractor.
Project Management System	A system or software application, used with a methodology to organize and execute the components of a project.
Project Manager	A professional in the field of project management tasked with the responsibility of the planning, execution and closing the project.
Proposer	A person, firm, or entity submitting a response to this RFP document.
Request for Proposal Process	A phased process to be utilized by NET RMA to select a Contractor to design, develop, deploy and maintain NET RMA ETCS.
Requirements Phase	The period in the Project where the Contractor, in collaboration with NET RMA, defines the hardware, software, reporting and communications requirements for the Project, which are then documented in the SRD and submitted to NET RMA for review and approval.
Revenue	The sum of the toll rates associated with trips.
Routine Maintenance Activities	Regularly scheduled inspections, repairs, adjustments tuning, and replacement of parts and components as required to keep the System in top operating condition.
System	Any and all reference to NET RMA's ETCS as specified in this RFP.
System Acceptance Test	The System Acceptance Test (SAT) is a consecutive thirty (30) day operational test period to evaluate and ensure that the Toll Collection System software and hardware performance meets the functionality, availability, accuracy and performance requirements.



System Detailed Design Document	Milestone deliverable describing the Project and ETCS hardware, software and communications design that shall be developed by the Contractor and delivered to NET RMA during the Design Phase of the Project for NET RMA review and approval.
System Requirements Document	The document developed by the Contractor in cooperation with NET RMA and submitted to NET RMA for review and approval as part of the system requirements review process that describes the full set of requirements for the Project.
System Requirements Phase	The phase of the project where business/system requirements are collected and documented.
Tag	See Transponder.
Tag Transaction	Synonymous with “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 in full the applicable toll rate.
Technical Evaluation Team	All NET RMA stakeholders who will jointly determine the technical suitability of the equipment, material, product, process or systems to best meet or exceed the intended objectives.
Technology Project Management	A methodology for organizing a project using industry standard project management principles.
Test Report	A document which details the results of a test or testing process, including and discovered defects, the severity of the defect, and the plan to resolve/correct the defect.
Testing Phase	The phase of the project where the hardware and software are tested to verify each complies with the requirements.
Toll Facility	A roadway or HOT Lane within a roadway for which travelers who are not toll-exempt pay a specified fee for usage.
Toll Point	A location on a roadway in which a toll is collected and can be either a single direction or bidirectional.
Toll Systems Integrator	The Prime Contractor (and their selected subcontractors) responsible for implementation of the Scope of Work for the Project.
Tolling Point	The location along an open-road ETC lane at which roadside or overhead detection and receiving equipment are placed and vehicles are electronically assessed a toll.





Transaction Record	The record created in NET RMA Toll Lanes containing data captured by the Lane Controller for vehicle passage. These Transaction Records are processed into trips and then transmitted to the CTRMA where they are posted to customer accounts.
Transponder (or Tag)	A radio transmitter-receiver mounted in a customer's vehicle that is used to communicate with a roadside reader for communicating a unique serial number and other information.
TSI, Contractor, or TSI Contractor	The person, firm or entity undertaking the Work identified in this Scope of Work under the terms of the Agreement and with whom NET RMA has entered the Agreement.
Violation	A transaction that is not matched to a Customer Account and is escalated through the collection process.
Web Services Description Language	Web Services Description Language is an Extensible Markup Language-based interface definition language that is used for describing the functionality offered by a web service. The acronym is also used for any specific Web Services Description Language of a web service (also referred to as a WSDL file), which provides a machine-readable description of how the service can be called, what parameters it expects, and what data structures it returns.
Work	Work shall mean without limitation all plant, labor, materials, Equipment, systems, services, including administrative, software, firmware and other facilities, design, installation, construction, testing, operational and maintenance and other things necessary and proper for or incidental to the carrying out and completion of the terms of the Contract Documents.



## APPENDIX B    Contract

Will be provided via an RFP Addendum



## APPENDIX C    NET RMA Technical Response Guide

Provided as a separate Microsoft Word Document.



## APPENDIX D Cost Proposal

Provided as a separate Microsoft Excel Document.



## APPENDIX E Service Level Agreement (SLA) Requirements

Provided as a separate PDF Document.



## APPENDIX F Typical Drawings and Straight-Line Diagrams

Provided as a separate PDF Portfolio Document.



## APPENDIX G    Equipment List

Provided as a separate Microsoft Excel Document.



## APPENDIX H    NET RMA Business Rules

Provided as a separate PDF Document.





## APPENDIX I      Proposal Forms

- 1) Acknowledgement of Addenda
- 2) Questions & Answer Form
- 3) Conflict of Interest Form

Provided as separate documents.



## APPENDIX J    NET RMA Data Retention Guidelines

Provided as a separate PDF Document.



## APPENDIX K Project Deliverable Schedule

Provided as a separate PDF Document.



## APPENDIX L National Interoperability (NIOP) ICD

Provided as a separate PDF Document.