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Project Implementation Schedule

Exhibit A – Project Implementation Schedule		
Major Milestone Description	Projected Start	Projected End
Notice to Proceed (NTP) of Implementation Phase	Sep 2026	--
Project Kickoff Meeting	Sep 2026	--
Project Planning Documentation (Project Schedule, Project Management Plan, Master Test Plan)	Sep 2026	60 Calendar Days after NTP
System Design		
Requirements Review and Business Rules Workshops	Nov 2026	Nov 2026
System Detailed Design Review	Nov 2026	Jan 2027
Bill of Materials	Dec 2026	Dec 2026
Third Party Hardware and Software Documentation Submitted	Jan 2027	Jan 2027
Draft System Detailed Design Document (SDDD) Approval	Jan 2027	Feb 2027
Final System Detailed Design Document (SDDD) Approval	Feb 2027	Mar 2027
Roadside Toll Collection System (RTCS) Installation Design and Documentation Package Approval	Jan 2027	Mar 2027
Final Installation Plan Approved	Apr 2027	May 2027
RTCS, Installation and Test		
Major Milestones: Factory Acceptance Test (FAT)	Jun 2027	Aug 2027
NCTA Operational Back Office (OBO) Interface Test	Sep 2027	Oct 2027
Maintenance Plan and Training Plan	Aug 2027	Oct 2027
Installation and System Acceptance	Mar 2028	
Installation and Commissioning Approved Ready for Go-Live - Tolling Location 1 Installation and OIT	--	40 Calendar Days after NTP2
Major Milestone: Toll Zone commissioning for revenue service during Site Installation Test - Installation and Site Installation Test of Complete 540 Phase 2 and RSS associated ITS Equipment. Installation and Commissioning Approved Ready for Go-Live - Tolling Locations 2 – 12.	--	120 Calendar Days after NTP2
Training Complete	--	30 Calendar Days prior to Go-Live
Complete 540 Phase 2 Go-Live	--	Jun 2028
Final Testing and Phase Closeout		
Start of Maintenance	--	Go-Live

Exhibit A – Project Implementation Schedule		
Major Milestone Description	Projected Start	Projected End
As-Built System Detailed Design Document (SDDD) Approved	--	Go-Live + 60 Calendar Days
As-Built Drawing Package Approved	--	Go-Live + 60 Calendar Days
System Acceptance Test	--	Go-Live + 60 Calendar Days

Note: Refer to the RFP Part V, Terms and Conditions for penalties associated with the deadlines for the **Major Milestones** which include the completion of **Factory Acceptance Testing** and **the commissioning of all Toll Zones and associated ITS equipment for revenue service**.

Exhibit B-1

Price Proposal Instructions

Table of Contents

1 GENERAL INSTRUCTIONS

Proposers shall complete their Price Proposals in accordance with the following instructions:

1. The Price Proposal Forms are provided in Excel format worksheets for ease of completion and checking.

2. Proposers shall submit their Price Proposals on the Price Proposal Forms included as Exhibit B-2. Price Proposals shall be sealed and submitted separate from the Technical Proposal.

3. The Price Proposal Forms shall constitute the full and complete Price Proposal for compensation for performance of the Contractor's obligations and Work under the Complete 540 Phase 2 Project.

4. Proposers must complete the Price Proposal Forms in their entirety. The Price Proposal Forms for the Project are as outlined in *Table 1* below.

5. Proposers should not fill in any grayed-out cells on the Price Proposal Forms, nor shall Proposers make any other entry on or alteration to the Price Proposal Forms other than in accordance with these Price Proposal Instructions.

6. NCTA may waive or correct any error appearing in a Proposer's completed Price Proposal Forms if the correct amount can be clearly ascertained from the information provided; however, NCTA is under no obligation to do so. In the event of an inconsistency between the amount stated in numbers and the amount stated in written words, <u>the amount stated in written words will be controlled</u>. In the event of a mathematical miscalculation, <u>the correct sum will be controlled</u>.

7. An officer of the Proposer or an individual otherwise authorized in writing by an officer of the Proposer must sign and date Sheet 1 in the appropriate place as identified.

8. All elements of the Price Proposal must be completed. <u>If zero quantities are included for a line item in the Proposal, a zero must be entered into the corresponding cell</u>. In addition, all items identified by NCTA in the Price Proposal Forms will be assumed to be included in the Price Proposal.

9. NCTA reserves the right to reject Price Proposals that are not completed in accordance with the instructions set forth herein.

10. Instructions for completion of each of the Price Proposal Forms are provided in Sections 2 through 12 below.

11. No price escalation will be allowed above the costs provided on the Price Proposal Sheets to complete this Work except as set forth in Section 12.

12. The Price Proposal shall be inclusive of all costs, fees and applicable taxes needed to meet the requirements of the RFP, included in **Part III, Scope of Work and Requirements**. Implementation pricing should be entered in 2027 dollar values. Maintenance costs should be entered for each year with maintenance activities starting in 2028. No price escalation will be allowed above the costs provided on the Price Proposal Forms to complete the Work.

2 INSTRUCTIONS ON COMPLETING THE PRICE PROPOSAL FORMS

1. The Price Proposal Forms, as detailed above, include pricing summary sheets (Sheets 1, 2, 3, 4, 5, 6, 7 and 8) and associated Backup information on Backup sheets for each pricing sheet. Backup sheets for each summary sheet are labeled to identify the corresponding summary pricing sheet; for example, Sheet 2-1 and Sheet 2-2 are Backup sheets to pricing Sheet 2. Backup sheets are located following summary sheets 1 through 8. The Additional Services Rates sheet 9-1 are standalone sheets and do not require a summary sheet.

2. Table 1 below summarizes the Price Proposal forms that shall be completed by all Proposers. Each form is located on a unique sheet in an Excel workbook. The table provides the following information for each form:

    a.   The sheet number (e.g. 2, 2-1, etc.)

    b.   The sheet title is listed at the top of each sheet

Table 1 – Price Proposal Form Summary

Sheet Number	Sheet Title
1	NCTA Triangle Expressway C540 P2 Project Summary
2	RSS Summary
2-1	Backup RSS
2-2	Backup ITS
3	TRH Summary
3-1	Backup TRH
4	Toll System Implementation
4-1	Backup Toll System Implementation
5	RSS Maintenance
5-1	Backup Base Contract and Optional Extensions: Triangle Expressway C540 P2 RSS Maintenance Cost Summary – Labor and Other Direct Cost Items by Month
6	TRH Maintenance
6-1	Backup Base Contract and Optional Extensions: Triangle Expressway C540 P2 TRH Maintenance Cost Summary – Labor and Other Direct Cost Items by Month
7	Facility Maintenance
7-1	Backup Base Contract and Optional Extensions: Triangle Expressway C540 P2 Facility Maintenance Cost Summary – Labor and Other Direct Cost Items by Month
8	ITS Maintenance
8-1	Backup Base Contract and Optional Extensions: Triangle Expressway C540 P2 ITS Maintenance Cost Summary – Labor and Other Direct Cost Items by Month
9-1	Labor Rates for Future Additional Services

3. The Price Proposal Forms are password protected and shall not be unlocked by Proposers. Only in the unlocked cells may the Proposers enter data.

4. Blue colored tabs represent summary sheets that do *not* require Proposer input. Green tabs represent worksheets that require Proposer input.

5. On most sheets there are formulas that are automatically calculated based on data entered from elsewhere in the sheet or workbook. Font and background colors are used to indicate different types of cells as follows:

- Black font – Indicates the cell cannot be altered by Proposer.

- Red font – Indicates the Proposer should enter data.

- Light yellow background – Indicates a cell where Proposer is expected to or may input data

- Light green background – Indicates that data has been entered into the cell. Light red and light-yellow background will change to light green when any non-zero data is entered. The background for any cells where the Proposer enters zero (0) will not change colors in this manner.

6. While NCTA has made every effort to ensure the Price Proposal Forms contain accurate formulas and calculation, Proposers are required to independently verify that formulas and calculations are being performed correctly.

3   TOTAL PROJECT COSTS

The Proposer's proposed total price shall be the aggregate of all costs included in Sheet 1. Sheet 1 will automatically roll-up and present the totals from Sheets 2 through Sheet 8. The total cost for the Implementation and Base Maintenance phases are aggregated in the row labelled "Total Implementation and Base Term Maintenance and Operations Cost", which will be the value used for the selection process. The Optional Extension costs are informational and will be referenced at the time of Contract Extension.

4   COMPLETION OF THE RSS and ITS COST SUMMARY - SHEETS 2, 2-1, 2-2

The Proposer's total price for the RSS and ITS Systems portion of the Implementation Phase shall be the aggregate of all costs included in Sheet 2 which covers all costs associated with the RSS and ITS System portion of the Work for the Triangle Expressway C540 P2.

The costs for Sheet 2 shall include (without limitation) all Equipment, supplies, Software, parts and materials, overhead, burden, profit, taxes, duties, fees, Contractor-acquired permits, licenses, warranties, and other items necessary to meet the Contractor contractual requirements associated with the RSS and ITS portion of the System.

The prices on Sheet 2 and related Backup sheets shall not include charges and costs associated with the Operations and Maintenance Phase. These costs shall be provided on separate Price Proposal Sheets as described below.

To complete Sheets 2, 2-1, and 2-2 Proposers should do the following:

1. **Sheet 2**. This sheet will be automatically populated from Sheet 2-1 and 2-2. No Proposer input is required.

2. **Sheet 2-1**. In the columns provided under each cost component, enter a description for each price element for each component in as much detail as space allows. Moving to the right in the 2nd column (B) enter the quantity for each item and in the 3rd column (C) enter the unit costs. If the item is provided as a lump sum, the quantity should be shown as 1. Total item costs will be calculated automatically. Moving to the right, in the 5th column (E), enter the labor costs associated with each of the price elements. The costs for each price element will then automatically be calculated, and the summary will be shown in the appropriate line item on Sheet 2. The costs entered into this first table are to be typical costs for a Toll Zone with two 12'

shoulders and three 12 foot travel lanes. The second table on this sheet, titled "Initial RSS Spares and Miscellaneous" is provided to capture the cost of initial spares, any additional costs to accommodate deviations from the typical zone geometry (such as a wider shoulder) and any other roadside installation costs which do not fall into a per zone structure (such as a local storage facility during installation).

3. **Sheet 2-2**. The ITS Device Integration table is expected to capture the per-device labor costs to integrate each ITS device into the RTCS ITSM and the NCDOT TMC. These per-device costs are then multiplied by the number of devices to calculate total cost in Sheet 1 Project Summary. ITS integration and maintenance are an optional scope of work, to be determined by NCTA. The inclusion or exclusion of this scope from the Project shall not influence any other costs on the project.

5   COMPLETION OF TOLL RECONCILIATION HOST COST – SHEETS 3 AND 3-1

The Proposer's proposed total price for the Toll Reconciliation Host (TRH) portion of the Implementation Phase shall be the aggregate of all costs included in Sheet 3 which covers all costs associated with the TRH System portion of the Work for the Triangle Expressway C540 P2.

The costs for Sheet 3 shall include (without limitation) all servers, supplies, software, communication equipment parts and materials, contractor-acquired lease, licenses, warranties, and other items necessary to meet the Contractor contractual requirements associated with the TRH portion of the System.

The prices on Sheet 3 and related Backup sheets shall not include charges and costs associated with the Operations and Maintenance Phase. These costs shall be provided on separate Price Proposal Sheets as described below.

1. **Sheet 3.** This sheet will be automatically populated from Sheet 3-1. No Proposer input is required.

2. **Sheet 3-1.** In the columns provided under each cost component, enter a description for each price element for each component in as much detail as space allows. Moving to the right in the 3rd column (C) enter the quantity for each item and in the 4th column (D) enter the unit costs. If the item is provided as a lump sum, the quantity should be shown as 1. Total item costs will be calculated automatically. Moving to the right, in the 6th column (F), enter the labor costs associated with each of the price elements. The costs for each price element will then automatically be calculated, and the summary will be shown in the appropriate line item on Sheet 3. There are 4 separate tables in this sheet, which cover the 3 components of the TRH and licenses and warranties to be included in the Implementation Phase. All tables must be completed. If Proposers find there is not adequate space or categories to detail the TRH pricing for their project, they may use the optional Price Proposal Backup document to detail prices and correlate the aggregate to the free form rows provided in the existing TRH pricing tables.

6   COMPLETION OF TOLL SYSTEM IMPLEMENTATION COST SHEETS 4 and 4-1

The Proposer's proposed total price for the RTCS (including RSS, TRH and ITS) portion of the Implementation Phase, excluding installation and materials costs, shall be the aggregate of all costs included in Sheet 4. This sheet covers all costs associated with the RTCS (RSS, ITS and TRH) for the Triangle Expressway C540 P2 to complete the implementation, such as project management, engineering and Design, and Testing.

The total price shall include (without limitation) all overhead, burden, profit, taxes, duties, fees, warranties, and other items necessary for the Contractor to complete the Work. The costs shall also include (without limitation) all Equipment, supplies, Software, parts and materials, Contractor-acquired permits, licenses, warranties, and other items necessary to meet the Contractor contractual requirements associated with the RTCS (including RSS, TRH and ITS) Cost applicable to these sheets.
The prices on Sheet 4 and related Backup shall not include charges and costs associated with the Operations and Maintenance Phase or costs otherwise covered on Sheets 2 and 3. These costs shall be set forth on separate Price Proposal Forms as described in Section 2 above.

Proposers shall complete Sheets 4 and 4-1 as follows:

1. **Sheet 4.** This sheet requires no input from the Proposer and will automatically be populated by values in Sheet 4-1 Backup Toll System Implementation.

2. **Sheet 4-1.** This Sheet contains 4 Tables, Toll System Project, Design, Testing and Implementation Documentation; Toll System Testing; Development and Testing Environment; and Potential Construction delay costs. Proposers shall provide a price for direct costs and labor for each item in these 4 Tables, in relation to the corresponding units provided. As shown in this sheet, NCTA will use an assumed 6-month construction delay to be included in the Proposer's price. The Proposer will not be eligible for any additional compensation due to project delay outside their control beyond the costs detailed in this Price Proposal under any circumstances. See section 2.5.2 Carrying Costs due to Project Delay Outside Contractor Control in Part V Terms and Conditions of the RFP for additional detail.

7 COMPLETION OF ROADSIDE HARDWARE MAINTENANCE AND SOFTWARE SUPPORT SERVICES COST (BASE AND OPTIONAL EXTENSIONS) SHEETS 5, and 5-1

The Proposer's proposed total price for the RSS Hardware Maintenance and Software Support Services Cost shall be the aggregate of all costs included in Sheet 5. This sheet covers all costs associated with the Maintenance of the RSS for the Triangle Expressway C540 P2.

The costs shall include (without limitation) all Contractor management, administrative and support labor costs, as well as all direct costs associated with maintaining the RSS Hardware Maintenance and Software Support Services Cost system. The total price shall include (without limitation) all overhead, burden, profit, taxes, duties, fees, warranties, Equipment, supplies, Software, parts and materials, Contractor-acquired permits, licenses, warranties, and all other items necessary to meet the Contractor contractual requirements associated with the RSS Hardware Maintenance and Software Support Services Cost Maintenance. All labor rates shall be final for each respective year. No Escalation will be allowed above the costs provided on these Price Proposal Forms.

Proposers shall complete Sheets 5, 5-1 as follows:

1. **Sheet 5.** This sheet is automatically populated from Sheet 5-1; it requires no input from the Proposer.

2. **Sheet 5-1**. For the Base Contract for Maintenance (Years 1–5), as well as for the Optional Extension 1 (Years 6-8) and the Optional Extension 2 (Years 9-11) for Triangle Expressway C540 P2, each year is identified with a corresponding set of Work elements. Starting in column (B), enter the monthly per-zone cost associated with each price element for each year of the Base Contract Term and Optional Maintenance Phase.

8   COMPLETION OF TRH HARDWARE MAINTENANCE AND SOFTWARE SUPPORT SERVICES COST (BASE AND OPTIONAL EXTENSIONS) SHEETS 6, and 6-1

The Proposer's proposed total price for the TRH Hardware Maintenance and Software Support Services Cost shall be the aggregate of all costs included in Sheet 6. This sheet covers all costs associated with the Maintenance of the TRH for the Triangle Expressway C540 P2.

The costs shall include (without limitation) all Contractor management, administrative and support labor costs, as well as all direct costs associated with maintaining the Software Support Services. The total price shall include (without limitation) all overhead, burden, profit, taxes, duties, fees, warranties, Equipment, supplies, Software, parts and materials, Contractor-acquired permits, licenses, warranties, and all other items necessary to meet the Contractor contractual requirements associated with the TRH Hardware Maintenance and Software Support Services Cost Maintenance. All labor rates shall be final for each respective year. No Escalation will be allowed above the costs provided on these Price Proposal Forms.

Proposers shall complete Sheets 6, 6-1 as follows:

1. **Sheet 6.** This sheet is automatically populated from Sheet 6-1; it requires no input from the Proposer.

2. **Sheet 6-1**. For the Base Contract for Maintenance (Years 1–5), as well as for the Optional Extension 1 (Years 6-8) and the Optional Extension 2 (Years 9-11) for Triangle Expressway C540 P2, each year is identified with a corresponding set of Work elements. Enter the monthly cost associated with each price element. The Total Monthly costs for each year will then automatically be calculated, and the summary will be shown in the appropriate line item on Sheet 6-1. Rates must be provided for each year of the Base Term and Optional Extension Maintenance Phases. *There are three expansion rows provided for each year of maintenance.

9   COMPLETION OF FACILITY MAINTENANCE (BASE AND EXTENSIONS) SHEETS 7 and 7-1

The Proposer's proposed total price for the Facility Maintenance Cost shall be the aggregate of all costs included in Sheet 7. This sheet covers all costs associated with the Facility Maintenance for the Triangle Expressway C540 P2.

The costs shall include (without limitation) all Contractor management, administrative and support labor costs, as well as all direct costs associated with fulfilling all Facility Maintenance requirements in the Contract. The total price shall include (without limitation) all overhead, burden, profit, taxes, duties, fees, warranties, Equipment, supplies, Software, parts and materials, Contractor-acquired permits, licenses, warranties, and all other items necessary to meet the Contractor contractual requirements associated with Facility Maintenance. All labor rates shall be final for each respective year. No Escalation will be allowed above the costs provided on these Price Proposal Forms.

Proposers shall complete Sheets 7, 7-1 as follows:

1. **Sheet 7.** This sheet is automatically populated from Sheet 7-1; it requires no input from the Proposer.

2. **Sheet 7-1**. For the Base Contract for Maintenance (Years 1–5), as well as for the Optional Extension 1 (Years 6-8) and the Optional Extension 2 (Years 9-11) for Triangle Expressway

C540 P2, each year is identified with a corresponding set of Work elements. Starting in column (C), enter the monthly per-zone cost associated with each price element. The Total Monthly costs for each year will then automatically be calculated, and the summary will be shown in the appropriate line item on Sheet 7-1. Enter the appropriate monthly rates for each year of the Base Contract Maintenance Term and the Optional Extension Maintenance Phases.

10 COMPLETION OF ITS HARDWARE MAINTENANCE AND SOFTWARE SUPPORT SERVICES COST (BASE AND OPTIONAL EXTENSIONS) SHEETS 8, and 8-1

The Proposer's proposed total price for the ITS Hardware Maintenance and Software Support Services Cost shall be the aggregate of all costs included in Sheet 8. This sheet covers all costs associated with the Maintenance of the TRH for the Triangle Expressway C540 P2. This portion of scope is optional at NCTA's determination. The inclusion or exclusion of this scope from the project shall not influence any other costs on the Project.

The costs shall include (without limitation) all Contractor management, administrative and support labor costs, as well as all direct costs associated with maintaining the ITS Hardware Maintenance and Software Support Services Cost system. The total price shall include (without limitation) all overhead, burden, profit, taxes, duties, fees, warranties, and labor. Contractor-acquired permits, licenses, warranties, and all other items necessary to meet the Contractor contractual requirements associated with the ITS Maintenance. All labor rates shall be final for each respective year. No escalation will be allowed above the costs provided on these Price Proposal Forms.

Proposers shall complete Sheets 8-1 as follows:

1. **Sheet 8-1**. For the Base Contract for Maintenance (Years 1–5), as well as for the Optional Extension 1 (Years 6-8) and the Optional Extension 2 (Years 9-11) for Triangle Expressway C540 P2, each year is identified with a corresponding set of Work elements. Enter the annual cost associated with each unit as defined in row 2 of each column. These unit annual costs will be multiplied by the total number of units on the project to determine the total annual cost. Proposers must enter rates for each year of the Base Maintenance Term.

11 COMPLETION OF ADDITIONAL SERVICES RATES SHEET 9-1

On Sheet 9-1, the Proposer shall provide a listing of staff positions and loaded hourly labor rates for the purpose of providing pricing for future Work not currently included in **Part III, Scope of Work and Requirements.** All changes to the Contract involving labor shall use the hourly labor rates in this table. All hourly labor rates shall be stated for the year 2028 and shall be inclusive of burden/overhead and profit. Hourly labor rates may be adjusted as detailed in Section 12 Cost Escalation.

12 COST ESCALATION

No escalation shall be permitted toward any costs provided in the Pricing Sheet for the Implementation and Base Maintenance Term. Optional Extension pricing will be finalized at the time of extension, and these values do not contribute toward the total contract value during initial procurement. The Additional Service Rates provided on sheet 9-1 may be adjusted though Change Orders, as needed.

Exhibit B-2

Pricing Sheets

(An Excel version of *Exhibit B-2: Pricing Sheets* is "paper clipped" to this Exhibits file for completion.)

Exhibit C-1
Proposal Cover Sheet

(A Word version of the Proposal Cover Sheet is "paper clipped" to this Exhibits file for ease of completion.)

NORTH CAROLINA TURNPIKE AUTHORITY
COMPLETE 540 PHASE 2 REQUEST FOR PROPOSALS
PROPOSAL COVER SHEET

EXECUTION: In compliance with this Request for Proposal, and subject to all the conditions herein, the undersigned offers and agrees to furnish any or all Services or goods upon which prices are offered, at the price(s) offered herein, within the time specified herein. By executing this offer, I certify that this offer is submitted competitively and without collusion.

Failure to execute/sign offer prior to submittal shall render Proposal invalid. Late offers are not acceptable.

Offer valid for one hundred and eighty (180) calendar days from Proposal Due Date.

Bidder Information

- Legal Name of Bidder:

- Street Address:

- P.O. Box (if applicable):

- City, State, and Zip Code:

- Primary Telephone Number:

- E-mail Address:

Authorization

- Print Name and Title of Signatory:

- Authorized Signature:

- Signature Date:

Exhibit C-2
List of Subcontractors and RS-2 Form

(PDFs of all forms are presented below. A fillable PDF of the RS-2 Form and a Word version of the List of Subcontractors Form are both "paper clipped" to this Exhibits file for ease of completion.)

Please duplicate this page as necessary to provide the requested information.

	SUBCONTRACTOR	SUBCONTRACTOR	SUBCONTRACTOR
Legal Name of Company			
Company's FEID Number			
Company Contact Name			
Company Address			
City, State, Zip Code			
Company Telephone No.			
Company Fax Number			
Company E-mail address			
Legal Name of Principal(s)			
Address of Principal(s)			
City, State, Zip Code			
Telephone No. of Principal(s)			
Fax Number of Principal(s)			
E-mail address of Principal(s)			
Corporate Number (if applicable)			
License Number (if applicable)			
Status of License (if applicable)			
Work to be Performed			
Expected Percentage of Total Work			

By: _____   Signature: (1) _____
            President or Vice President

Attest: _____   Signature: (2) _____
            Secretary (or Assistant Secretary)

(Affix Corporate Seal Below Dotted Line)
****

Exhibit C-2: RS-2 Form

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
SUBCONSULTANT
TO BE USED WITH PROFESSIONAL SERVICES CONTRACT ONLY
RACE AND GENDER NEUTRAL

TIP No. and/or Type of Work (Limited Services)	

(Consultant/Firm Name and Federal Tax Id)

(Subconsultant/Firm Name and Federal Tax Id)

SERVICE / ITEM DESCRIPTION	*Anticipated Utilization*
TOTAL UTILIZATION:	

SUBMITTED BY:	**RECOMMENDED BY:**
SUBCONSULTANT:	CONSULTANT:
*BY:	*BY:
TITLE:	TITLE:

SPSF Status:	Yes ☐ No ☐

"SUBCONCONSULTANT" (FORM RS-2)
RACE AND GENDER NEUTRAL

Instructions for completing the Form RS-2:

1. Complete a Subconsultant Form RS-2 for each Subconsultant firm to be utilized by your firm.

2. Insert TIP Number and /or Type of Work (Limited Services)

3. Complete the Consultant/Firm name and Federal Tax ID Number for the primary firm information.

4. Complete the Subconsultant/Sub Firm name and Federal Tax ID Number for the sub firm information.

5. Enter Service/Item Description – describe work to be performed by the Sub Firm

6. Enter Anticipated Utilization – Insert dollar value or percent of work to the Subconsultant/Sub Firm

7. *Signatures of both Subconsultant and Prime Consultant **are required** on each RS-2 Form to be submitted with the Letter of Interest (LOI) to be considered for selection

8. Complete "SPSF Status" section - Subconsultant shall check the appropriate box regarding SPSF Status, check Yes if SPSF or No if not SPSF

In the event the firm has **no** subconsultant, **it is required that this be indicated on this Subconsultant Form RS-2 form by entering the word "None" or the number "ZERO" and signing the form.**

Exhibit C-3

Recent Client List

(A Word version of the Recent Client List is "paper clipped" to this Exhibits file for ease of completion.)

#	Name of Client including Address and Telephone #	Project Name	Project Description	Start Date	End Date	Contract Amount
001						
002						

Exhibit C-4

Proposer Questions Form

(A Word version of the Proposer Questions Form is "paper clipped" to this Exhibits file for ease of completion.)

#	Page	Section	Section Description	Proposer Question	NCTA Response
1.					
2.					
3.					
4.					
5.					
6.					
7.					
8.					
9.					

Exhibit C-5

Non-Collusion Forms

(Please complete a single form that is applicable to your firm structure. Fillable PDFs of the form are "paper clipped" to this Exhibits file for ease of completion.)

Exhibit C-6
Acknowledgement of Receipt of Addenda

(A Word version is "paper clipped" to this Exhibits file for ease of completion.)

<u>ACKNOWLEDGEMENT OF RECEIPT OF ADDENDA</u>

The Proposer shall acknowledge receipt of each addendum to this Request for Proposal by completing this form and including same in the Technical Proposal.

<u>Addenda</u>	<u>Date</u>	<u>By</u>
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

Failure to confirm receipt of addenda may result in rejection of the Proposer's Proposal.

Dated _____, 2026

Legal Name of Firm

By _____

    Signature

_____

Title

NOTE: Attach additional pages as necessary

Exhibit C-7
HUB Supplemental Vendor Information Form

(A fillable PDF version is "paper clipped" to this Exhibits file for ease of completion.)

Exhibit C-7: HUB Supplemental Vendor Information

RFP Name : _____

Vendor Name: _____

Historically Underutilized Businesses (HUBs) consist of minority, women, and disabled business firms that are at least fifty-one percent owned and operated by an individual(s) from one of these categories. Also included in this category are disabled business enterprises and non-profit work centers for the blind and severely disabled.

Pursuant to G.S. 143B-1361(a), 143-48 and 143-128.4, the State invites and encourages participation in this procurement process by businesses owned by minorities, women, the disable, disabled business enterprises, and non-profit work centers for the blind and severely disabled. This includes utilizing individual(s) from these categories as subcontractors to perform the functions required in this Solicitation.

The Vendor <u>shall</u> respond to questions below, as applicable.

PART I: HUB CERTIFICATION

Is Vendor a NC-certified HUB entity? ☐ **Yes** ☐ **No**

      If **yes**, provide Vendor #: _____

      If **no**, does Vendor qualify for certification as HUB? ☐ **Yes** ☐ **No**

      Vendors that check "yes" will be referred to the HUB Office for assistance in acquiring certification.

PART II: PROCUREMENT OF GOODS - SUPPLIERS

For *Goods* procurements, are you using Tier 2 suppliers? ☐ **Yes** ☐ **No**

      If **yes**, then provide the following information:

Company Name	Company Address	Website Address	Contact Name	Contact Email	Contact Phone	NC HUB certified?	Percent of total bid price

PART III: PROCUREMENT OF SERVICES - SUBCONTRACTORS

For *Services* procurements**,** are you using Subcontractors to perform any of the services being procured under this solicitation? ☐ **Yes** ☐ **No**

   If *yes*, then provide the following information:

Company Name	Company Address	Website Address	Contact Name	Contact Email	Contact Phone	NC HUB certified?	Percent of total bid price

Need more information?

Questions concerning the completion of this form should be presented during the Q&A period through the process defined in the Solicitation document.

Questions concerning NC HUB certification, contact the **North Carolina Office of Historically Underutilized Businesses** at 984-236-0130 or huboffice.doa@doa.nc.gov

.

Exhibit C-8

Requirements Conformance Matrix

(An Excel version is "paper clipped" to this Exhibits file for ease of completion.)

Exhibit C-8: Instructions for Completing Requirements Conformance Matrix

1)   The Proposer must complete and submit the Requirements Conformance Matrix which is provided as Exhibit C-8.

2)   The Matrix covers each of the requirements set forth in Part III, Scope of Work and Requirements.

3)   Proposers shall not alter the requirements listed in the Requirements Conformance Matrix in any way and must use the provided Excel version of Exhibit C-8. The Proposer shall submit BOTH a PDF version AND Excel version of the completed Matrix in Technical Proposal Section 7. *See submittal instructions in **RFP Part IV**, *Section 1.1.I. I. Proposal Section 6: Adherence to the Scope of Work and Requirements, Terms and Conditions and Requirements Conformance Matrix*

4)   The following are instructions for completion of Part III of the Requirements Matrix worksheet:

    a)   There are four (4) columns in the Part III Requirements listed in the Requirements Conformance Matrix worksheet as follows:

        i.   No. (Column A): A sequential number that matches the requirement number in the Requirements.

        ii.   Requirements (Column B): A description of each requirement.

        iii.   Status (Column C): Proposer must select one of the four (4) response codes for each Requirement and enter it in this column as further detailed in item "b)" below.

        iii.   Source (Column D): Indicate who will be providing the functionality; Proposer (P), Subcontractor (S), Third Party (T) and Not Applicable (NA).

        iv.   Subcontractor Name and/or 3rd Party Product/Vendor, If Applicable (Column E): If the functionality is
          provided by a Subcontractor or third party then please enter the name of the party/product.

        v.   Comments (Column F): This field must be completed if the Status code is entered as "E = not provided" for the particular requirement in order to explain why the Proposer is not complying with this Requirement.

    b)   Proposers must complete the Status (Column C) in the following manner:

        i.   Base Product = B: Enter an "B" in this column if the requirement described is already incorporated into the Proposer's baseline system and is provided in the proposed Roadside Toll Collection System.

        ii.   Base Modified = M: Enter an "M" in this column if the functionality exists and is provided in the proposed Roadside Toll Collection System but needs to be modified to meet the requirement.

        iii.   New Development = D: Enter a "D" if the Proposer's baseline system does not currently have the required functionality but the functionality will be provided in the proposed Roadside Toll Collection System and will be developed to meet the requirement.

        iv.   Exception = E: Enter an "E" if the Proposer will not provide the functionality and will not meet the requirement as part of its Proposal. If any row in the Status column is completed as "E" then Proposer must provide an explanation in the Comments (column D) in the corresponding row. The comment field may reference information that is included elsewhere in the Proposal. **All Exceptions require an explanation.**

No.	Requirements	Required Inputs			
		Status	Source	If Applicable	Comments
		B-Base Product M-Base Modified D-New Development E-Exception	P-Proposer S-Sub T-Third Party NA-Not Applicable	Subcontractor Name and/or 3rd Party Product/Vendor	Comment required if "Exception", optional otherwise.
1	The Contractor shall use an NCTA-provided online, electronic document management system (such as SharePoint) that is accessible to both NCTA and the Contractor by username and password, to control all project-related documents, submissions, and drawings.				
2	The Contractor shall maintain a Deliverable tracking list that accurately tracks all Contractor submissions, NCTA's review comments, resubmissions, and final Approval.				
3	Each document shall be properly titled, date updated, numbered by revision and version, and shall incorporate signature blocks for authorship and Approvals. The Contractor shall provide a logical indexing system making use of documents metadata for ease of access for NCTA to locate documents in the electronic document management system.				
4	Updated submissions of the document shall also include the red-lined version showing all revisions to the document since the last submission.				
5	The Contractor shall submit a minimum of a preliminary draft, a final draft, and a 100% final to NCTA for review and Approval. NCTA will provide new comments in two iterations, provided that the Contractor provides the Deliverables in accordance with the Project Schedule. Additional iterations may be necessary to resolve comments. All final documents shall incorporate all NCTA's review comments to NCTA's satisfaction. Each subsequent submission of a Deliverable shall also include NCTA's comments review log with the resolution of each comment updated by the Contractor.				
6	NCTA will review and Approve all documents submitted under the Contract. For documents containing less than one hundred (100) pages, NCTA will review and provide comments on preliminary draft documents within ten (10) Business Days. For documents containing more than one hundred (100) pages, NCTA will review and provide comments on preliminary draft documents within fifteen (15) Business Days. NCTA will review and provide comments on all final drafts and final documents within ten (10) Business Days. When multiple documents are submitted to NCTA simultaneously, or within one week of each other, the number of Business Days required for review shall be adjusted to reflect the overlapping submissions.				
7	The Contractor shall submit an electronic version of all Contractor-developed documentation for NCTA review and Approval unless directed by NCTA to provide hard copies. Acceptable electronic formats are Microsoft Office 365 Suite (or other Approved format), unsecured PDF and professional CAD applications for Contractor-prepared documentation.				
8	The Contractor is required to update documentation as changes occur through the Implementation and Maintenance Phase and shall maintain a document submittals list on the electronic document management site identifying all versions of documents, the date submitted, the nature of changes and provide relevant updates to NCTA as they are published.				
9	The documentation package for all submittals as applicable shall include all required electronic media to install, operate, and maintain the RTCS/Deliverable/document being supplied.				
10	The Program Management Plan shall, at a minimum, include the following elements:				
	a) Project scope and key Deliverables;				
	b) a description of the management and organization of the program, an organization chart, identification of key team personnel and their responsibilities, percentage commitment to the Project, task leads for each functional area and location and identification of the resources and key personnel during the Contract to be used in fulfilling the Requirements of the Contract;				
	c) Project team (Contractor, Subcontractors, NCTA, NCTA representatives, NCDOT) contact information;				
	d) a succession plan for key personnel (All successors should be familiar with the Project and be able to engage in the Project, if necessary, should key personnel no longer be on the project);				
	e) a description of the Project planning, documentation and reporting methods to be utilized, both for use within the Contractor's staff and externally to NCTA and other entities;				
	f) a description of the process for communication, escalation, and resolution of project issues with NCTA;				
	g) meeting schedules with NCTA and other entities including the form of the meeting;				
	h) inclusion of the Approved Project Schedule;				
	i) a description of the process for reporting, updating and tracking the Project Schedule and Project performance;				
	j) a description of the coordination process with NCTA, and NCDOT during the tolling facility infrastructure Implementation Phase;				
	k) a description of the coordination process with NCTA, and NCDOT during the installation drawing review process;				
	l) approach to change management, consistent with Contract Requirements, including a description of the process for documenting and submitting change requests, the Approval process and how the change management approach shall be integrated into daily Project management;				
	m) approach to document control, including Software NCTA will use to access the documents;				
	n) detailed plan for software change management process to be followed throughout implementation and operations;				
	o) approach to risk management;				
	p) approach to QA and QC;				
	q) documenting the invoice submission, invoice backup information, verification, and Approval process;				
	r) a section with all Approved Project forms including but not limited to, meeting agenda, meeting notes, action items tracking log, monthly progress report, and invoices; and				
	s) an emergency contact list and succession plan.				
11	The Contractor shall identify the tools and products used to manage the Project, including the Software development lifecycle and the internal controls instituted by the Contractor to guarantee successful delivery of the Project.				
12	The Contractor shall develop and submit the communication procedures to NCTA for review and Approval that address the following, including but not limited to:				
	a) Correspondence - correspondence shall be identified as to originator and designated receiver and include the form of transmission;				
	b) Document Control - tracking of document versions and changes including naming conventions;				
	c) Invoices - all invoices shall be submitted with accompanying backup information as required by the Contract and consistent with NCTA processes and invoicing and auditing policies. The Contractor shall work with NCTA to develop the appropriate invoice and back-up materials as a part of the PMP development;				
	d) Submittals - all submittals shall be delivered as an enclosure to the Contractor's submittal letter. Each submittal letter shall be limited to a single subject or item. The Contractor's letter shall identify the contract number, contract name, and subject of the submittal;				
	e) Contract Number and Contract Name - all items of correspondence, invoices, submittals and documentation shall contain the contract number and the designated contract name; and;				

No.	Requirements	Required Inputs			
		Status B-Base Product M-Base Modified D-New Development E-Exception	**Source** P-Proposer S-Sub T-Third Party NA-Not Applicable	**If Applicable** Subcontractor Name and/or 3rd Party Product/Vendor	**Comments** Comment required if "Exception", optional otherwise.
	f) Comments Log - process for validating that all comments provided by NCTA on Contractor Deliverables are successfully addressed.				
13	The Contractor shall provide a Requirements Traceability Matrix (RTM) within thirty (30) Business Days after the issuance of the Contract unless otherwise agreed to by NCTA and the Contractor in writing. The RTM shall include, but not limited to:				
	a) listing and categorization of all functional and technical Requirements;				
	b) identification of the source of all Requirements;				
	c) additional derived requirements required to verify by inspection, test, demonstration or analysis Requirements for this Contract.				
	d) identification of the design section of the SDDD that addresses the Requirement; and				
	e) identification of the test procedure that addresses the Requirement.				
14	The Contractor shall maintain the RTM throughout the Project and submit an updated RTM along with any new document or document update that impacts content of the RTM.				
15	The Contractor is responsible for maintaining and assigning a competent and qualified professional who speaks fluent English to meet the requirements of the Contract.				
16	The Contractor shall ensure key personnel is readily accessible to NCTA or their authorized representatives during the Contractor's performance of this Contract.				
17	The Contractor is required to provide sufficient staff at all times to meet the Project Requirements and Contract. The following are designated as key personnel for this Project and are subject to the Approval, replacement, and removal requirements of NCTA for key personnel.				
	a) Project Principal – responsible for the overall conduct and performance of the Project; oversight of the Project; the performance of the Contractor Project Manager and a point of contact for any escalated project issues that cannot be resolved by the Contractor Project Manager. The Project Principal shall have experience in AET projects in the last five (5) calendar years.				
	b) Contractor Project Manager – responsible for all daily work, the overall execution and delivery of the Project and the Contractor contact person on the Project. The Contractor Project Manager shall have worked as a Project Manager in All-Electronic Roadside tolling. The Contractor Project Manager shall be one hundred percent (100%) dedicated to the Project during the Implementation Phase of the Project, and fifty percent (50%) dedicated during the Operations & Maintenance Phase of the Project.				
	c) Technical Manager - responsible for the management of all the design, development and implementation of the technology solution and resources related to the RTCS and interfaces to a NCTA provided OBO. The Technical Manager shall serve as the overall RTCS solution architect, including management of Software development, backlog, on-going Hardware/Software maintenance, Equipment and systems and information security as required to satisfy the requirements of the Contract. The Technical Manager shall be one hundred percent (100%) dedicated to the Project during the design, development, and commissioning of the Project. The Technical Manager shall have worked in an equivalent position for similar transaction processing projects that include cloud or virtual machine host deployments.				
	d) Installation Manager – responsible for the installation and commissioning of the RTCS and its external interfaces. The Installation Manager shall work primarily in the applicable project area but shall need to attend regular meetings at the NCTA Raleigh offices and be available in Raleigh or project vicinity, with adequate notice, Monday through Friday from 8 a.m. eastern to 5 p.m. eastern or additional days or times as required to complete the work. During the installation of the Project, the Installation Manager shall be one hundred percent (100%) dedicated to the Project. The Installation Manager shall have worked in an equivalent position on similar toll projects.				
	e) Maintenance Manager – responsible for the Maintenance Services of the RTCS and its external interfaces. The Maintenance Manager shall work primarily in the applicable project area but shall need to attend meetings at the NCTA Raleigh offices, with adequate notice, Monday through Friday from 8 a.m. eastern to 5 p.m. eastern or additional days or times as required to complete the work. During the Operations and Maintenance Phase, the Maintenance Manager shall be one hundred percent (100%) dedicated to the Project. The Maintenance Manager shall have worked in an equivalent position on similar toll projects.				
	f) Quality Assurance Manager – responsible for consistent quality throughout the design, development, testing, and implementation of the Project through good QA and QC practices. The Quality Assurance Manager shall have worked on projects of similar scope and size.				
	g) Test Manager – responsible for the overall planning and implementation of the Project's testing program. The Test Manager shall be one hundred percent (100%) dedicated to the Project during the development of testing plans and procedures and during the testing of the Project. The Test Manager shall have worked in an equivalent position similar all-electronic roadside toll collection, and transaction processing projects.				
18	The Contractor shall cooperate to the fullest extent with NCTA and NCDOT to ensure the Project Implementation and Maintenance Services do not conflict with or cause any interruption in capability, service or safety issues to the traveling public or customers.				
19	The Contractor shall cooperate with the Constructor, NCTA, NCDOT, existing contractors, and external parties, as directed by NCTA, to support any activity related to the RTCS Implementation, including but not limited to:				
	a) NCTA employees;				
	b) NCTA Designated Representatives;				
	c) other third parties, as directed by NCTA;				
	d) law enforcement;				
	e) inspectors;				
	f) auditors, and;				
	g) all contractors.				
20	The Contractor shall cooperate with and immediately notify NCTA of any customer complaints and RTCS defects identified in the toll lanes or facilities that come to the Contractor's attention during implementation, testing, or maintenance.				
21	The Contractor shall provide and maintain a current emergency contact list for NCTA's use at all times for handling emergencies and escalations. The emergency contact list shall name primary and secondary (multiple secondary contacts as applicable) points of contact for each anticipated emergency type. The emergency contact list shall name the Contractor's preferred points of contact in order of precedence and shall include, at a minimum, the Contractor's project manager, installation manager, technical manager, and other support staff. The purpose of the emergency contact list is to ensure the Contractor can be reached outside normal working hours to address urgent matters.				
22	The Contractor shall provide and maintain a schedule for monthly progress meetings at a location designated by NCTA. The meeting shall be scheduled no later than the 20th day of the following month and shall cover progress up to the 15th of the current month.				
23	No less than five (5) Business Days prior to the meeting, the Contractor shall submit a draft monthly progress report to NCTA for the period covering the previous reporting period. NCTA will review and comment on the progress report prior to or during the meeting.				

No.	Requirements	Status	Source	If Applicable	Comments
		B-Base Product M-Base Modified D-New Development E-Exception	P-Proposer S-Sub T-Third Party NA-Not Applicable	Subcontractor Name and/or 3rd Party Product/Vendor	Comment required if "Exception", optional otherwise.
24	The Contractor shall obtain Updated installation status prior to the monthly meeting and include such Updates in the Project Implementation Schedule which shall be submitted with the monthly progress report				
25	The format of the monthly progress report shall be agreed upon as one of the initial project tasks upon NTP and shall be incorporated by the Contractor into the Program Management Plan.				
26	The monthly progress report shall include but not be limited to the following items:				
	a) a summary outlining progress and status, and percentage of work performed for each task as compared to planned activities in the Project Schedule. Comments shall be included where appropriate. The summary shall also identify key milestones met and missed in the period.				
	b) an analysis of all critical path tasks, potential risks associated with the tasks, and proposed contingency/workaround plan to circumvent or mitigate delays to the Project.				
	c) identification of any Approved changes to Approved milestone dates and Approved Project Schedule, clearly noting the details and identifying the Contract Amendment.				
	d) a discussion of schedule compliance and an updated Project Schedule showing current status against the baseline Approved Project Schedule. Past due tasks shall be updated, and actual dates shall be recorded for completed tasks.				
	e) construction/installation coordination status;				
	f) an updated action items list that tracks the status of all outstanding action items, activities and issues that need decision/resolution;				
	g) an updated Deliverables list showing submission dates, current version, current review status, responsible party, and due date;				
	h) a payment request, if applicable. Payment requests shall identify the payment milestone, number, and dollar amount. Payment requests shall be made for completed and Approved milestone payments only;				
	i) a list of change requests (Contractor and NCTA initiated) and their status;				
	j) the previous monthly final meeting minutes; and				
	k) a six (6) week look-ahead schedule.				
27	No more than five (5) Business Days after the meeting, the Contractor shall submit the final monthly progress report and draft meeting minutes for NCTA's review and Approval.				
28	In addition to the monthly progress meeting, weekly or bi-weekly project status meetings, as applicable and Approved by NCTA, and other regularly scheduled installation and ad-hoc project meetings shall be required during the course of the Project to address specific Deliverables, work items, maintenance procedures, and issues as they arise.				
29	The Contractor shall perform the following tasks related to all meetings, including but not limited to:				
	a) develop and coordinate the Project meeting schedule;				
	b) distribute notices of project meetings in accordance with document control requirements;				
	c) prepare the agenda in coordination with NCTA;				
	d) attend the meeting with all required staff in attendance;				
	e) prepare minutes of the meeting and forward them to NCTA within five (5) Business Days after the meeting date; and				
	f) maintain an action item list for each type of meeting, identifying issues that need to be resolved at the project level.				
30	The Contractor shall provide and maintain a detailed Project Schedule for the Project in Microsoft Project format (Project 365 or above) that lists all project activities and tasks in the Contract, including but not limited to:				
	a) requirements;				
	b) design;				
	c) development;				
	d) testing;				
	e) installation;				
	f) transition; and				
	g) deployment and acceptance of the RTCS.				
31	The Project Schedule shall include coordination with Constructor, NCDOT, existing contractors, and NCTA and shall clearly document all interfacing tasks.				
32	The Project Schedule shall identify all milestones and tasks, starting with the NTP through the date of acceptance for the entire duration of the contract.				
33	The Project Schedule shall be resource loaded, shall include all draft submissions and review cycles, and shall include all tasks required of NCTA, NCDOT and other contractors with critical tasks.				
34	The Project Schedule shall identify all critical path tasks and shall be used to manage the Project.				
35	The baseline for the Project Schedule shall be submitted to NCTA for Approval ten (10) Business Days after NTP. Once Approved, the baseline Project Schedule shall only be modified by Contract Amendment.				
36	The Contractor shall maintain status and update the Project Schedule at least once a month, as identified in the requirements for the monthly progress report.				
37	The Contractor shall obtain Approval from NCTA for any and all changes to the Approved Baseline Project Schedule and associated milestones. In accordance with the Contract process for changes and amendments, schedule changes are not considered Approved unless an Amendment is executed.				
38	The Contractor shall establish and maintain an effective Software design and development program along with a documented Software development life cycle to ensure compliance with the Requirements of the Contract.				
39	Prior to conducting any workshops, requirements reviews, focus group meetings, and design reviews, the Contractor shall develop the necessary documentation for NCTA review and submit such documentation ten (10) Business Days prior to such meetings.				
40	The NCTA Business Policies for NC Quick Pass and Roadside and the RTM shall be used to develop the SDDD.				
41	The Contractor shall schedule design meetings with NCTA to understand the design requirements fully.				
42	The Contractor shall demonstrate pre-production working products (such as beta versions) during the design review process, and stakeholders shall be walked through the workflow, utilizing screens and data flow diagrams.				
43	The Contractor shall trace how the RTCS design meets the SDDD, the NCTA Business Policies, and the Contract Requirements using the RTM.				
44	The RTM shall map all requirements to Contractor documentation and/or testing as applicable.				

No.	Requirements	Required Inputs			
		Status	Source	If Applicable	Comments
		B-Base Product M-Base Modified D-New Development E-Exception	P-Proposer S-Sub T-Third Party NA-Not Applicable	Subcontractor Name and/or 3rd Party Product/Vendor	Comment required if "Exception", optional otherwise.
45	The Contractor shall develop and submit a System Detailed Design Document (SDDD) that describes the design specifications of all Hardware and Software provided as part of the RTCS to meet the Approved Contract Requirements. The SDDD shall demonstrate that the Contractor understands the functional, technical, and Performance Requirements of the RTCS and has the processes, Hardware and Software design in place to provide a high-quality and reliable product that meets the Requirements of the Contract.				
46	The Contractor shall provide detailed drawings of Equipment rack space layout for NCTA review/Approval (verification) for consistency with the toll Equipment pad design.				
47	The SDDD shall include the use of diagrams, figures, tables, and examples, and it shall apply to all environments, including production, Quality Assurance, training, and testing environments.				
48	The SDDD shall include but not be limited to: a) System architecture, including overall system design concept; b) lane layout electrical and logic diagrams; c) the requirements for all peripheral device Interfaces and control; d) roadside server design, including sizing and processing calculations; e) storage system design, including sizing and processing calculations; f) data backup systems design, including sizing and processing calculations; g) network sizing and design details including IP scheme; h) Uninterruptable Power Supply (UPS) sizing information detailing all Equipment on the UPS(s) and their total power requirements; i) high availability design, including servers, storage, network, database, and application; j) Disaster Recovery (DR) design, including servers, storage, network, database, data resiliency, and application. k) business continuity design, including cameras, AVI Equipment, and other associated Equipment near a tolling point in the case of catastrophic damage to the gantry at a damaged Toll Zone; l) Hardware dependencies and inter-dependencies; m) detailed infrastructure Software design, n) detailed operating systems design; o) detailed peripherals configurations, including requirements for all peripheral device Interfaces and control; p) all internal RTCS Interfaces; q) all custom-developed Software; r) all Software provided by the Contractor or a third party; s) Software dependencies and inter-dependencies; t) detailed database design, schema and data modeling, including sizing and processing calculations; u) Entity Relationship Diagram (ERD); v) data flow diagrams, state diagrams and data queues; w) module level descriptions and interaction among various modules; x) detailed description to the module and/or process level for all the functions according to the functional requirements of the RTCS; y) lane logic and vehicle framing design and rules with illustrations; z) degraded mode of operations and impacts of failures on system operations; aa) transaction audit and pre-processing; bb) transaction processing design, including sizing and processing calculations; cc) detailed interface specifications between all Software components; dd) design RTCS system interfaces including electronic interface to the NCTA provided OBO; ee) detailed data management design and processes, including summarization, archiving and purging; ff) all user interfaces (including reports and screen formats); gg) system data dictionaries; hh) application performance monitoring design; ii) access/identity security methodology; jj) environmental specifications; kk) specification sheets for all Equipment; ll) Details of all system alarms and assigned priorities; mm) a logical division and an index of all contents within the SDDD, and; nn) upon the completion of the Software development, and prior to the start of the RTCS formal testing, the Contractor shall submit the final updated SDDD that includes all changes/clarifications made during the Software development and validation activities.				
49	The Contractor shall submit an updated SDDD on an annual basis throughout the Contract Term that includes all changes/clarifications made during the just-completed year. The Contractor shall use the Approval of System Acceptance as the anniversary date to deliver an SDDD as described above.				
50	The Contractor shall provide the installation requirements including acceptable tolerances for the system Equipment, including all related plans and documents. The Contractor shall be fully responsible for the accuracy of its installation requirements.				
51	The Contractor shall prepare and submit the RTCS Installation Design Requirements package to NCTA for review in accordance with the Approved Project Schedule.				
52	The Contractor shall develop a half-size (11" by 17") set of drawings providing sufficient and accurate detail to install the system components.				

No.	Requirements	Required Inputs			
		Status	Source	If Applicable	Comments
		B-Base Product M-Base Modified D-New Development E-Exception	P-Proposer S-Sub T-Third Party NA-Not Applicable	Subcontractor Name and/or 3rd Party Product/Vendor	Comment required if "Exception", optional otherwise.
53	In addition, the drawing shall contain notes and other detail defining specific processes that cannot be graphically depicted. The notes shall also be used to delineate specifications, tolerances, special conditions, or any other factor required to install and integrate a fully functional system.				
54	The Contractor shall indemnify all related parties as more fully described in the Part V, Terms and Conditions for any damages that result from reliance on the installation requirements provided by the Contractor.				
55	The Contractor shall submit shop drawings detailing the installation design that shall be used onsite for installation work. Detailed drawings shall be provided for each site where Equipment procured and supplied under the Contract shall be installed.				
56	The drawings shall include but not be limited to the following:				
	a) lane Equipment layout for each tolling location type;				
	b) placement of the Equipment on the toll gantry;				
	c) lane geometry and dimensions of actual size and placement of all roadside Equipment;				
	d) Equipment brackets mounting detail to the mounting arm;				
	e) a detailed drawing showing the Equipment mounting brackets and details of their installation to the gantry;				
	f) specifications and tolerances;				
	g) detailed installation drawing for each piece of Equipment;				
	h) details related to the range of Equipment adjustments;				
	i) conduit and cable schedule showing all conduits, cables, and wires used for each RSS location;				
	j) detailed conduit layout for power and communications;				
	k) all junction boxes and panels;				
	l) any specific infrastructure limitations				
56	m) placement of overhead sensors;				
	n) details describing the termination process for each termination;				
	o) lightning and surge suppression system;				
	p) a graphical diagram of the network connectivity and data flow;				
	q) detailed interconnection diagrams for all systems;				
	r) detailed electrical schematics;				
	s) detailed communications layout;				
	t) Equipment rack layout, including power panels and connection to the UPS;				
	u) detailed cabinet and Equipment rack layout and interconnections;				
	v) detailed cabinet and Equipment rack space requirements;				
	w) a detailed diagram of the network connectivity, including IP scheme;				
	x) server set-up and configuration; and				
	y) other Hardware installation and connections.				
57	The Contractor shall use only the latest Approved drawing version for installation.				
58	The Contractor shall provide the installation requirements for the Equipment, including all related plans and documents. The Contractor shall certify the installation requirements provided as accurate and appropriate for its intended purpose, to the satisfaction and Approval of NCTA.				
59	During installation, the Contractor shall maintain a redline version of the drawing package that is submitted to NCTA upon the completion of the installation.				
60	Documentation shall include memos denoting changes or modifications to Requirements.				
61	The Contractor shall submit detailed component level network drawings showing all WAN, LAN and VLAN connections, including connection to the TRH, NC Quick Pass Operations Center, MRTMC, NCTA OBO and the STOC, as applicable.				
62	The Contractor shall submit detailed network drawings showing all WAN, LAN and VLAN connections, including all interface connections and IP addresses for all Equipment on the network.				
63	The Contractor shall secure the services of a fully qualified engineering design firm(s) for the purpose of performing any necessary infrastructure-related engineering design (civil, structural, electrical, mechanical, and architectural) and the preparation of related plans and documentation under the Contract for any design that impacts life safety. The Contractor shall submit the name of the engineering design firms in its proposal for NCTA Approval. Any changes to the engineering firm shall be submitted to NCTA for Approval.				
64	All design work shall be performed under the direct supervision of a licensed engineer of the appropriate discipline in the State of North Carolina. All design professionals shall be licensed and authorized to practice in the State of North Carolina.				
65	The Contractor's design submittals typically shall not be required to be signed / sealed by a licensed engineer. However, should the Contractor provide custom manufactured infrastructure that is structural in nature or other structure(s) or appurtenances (e.g., Equipment mounting brackets, Equipment arms, etc.) that have the potential to impact life safety, the Contractor shall secure the services of a fully-qualified engineering design firm(s) licensed in North Carolina for the purpose of performing engineering design and the preparation of related plans and documentation under the Contract.				
66	In addition, any electrical work performed in an occupied building shall require the seal of a licensed engineer of the appropriate discipline in the State of North Carolina.				
67	The Contractor shall include the Bill of Materials (BOM) for all Equipment and Hardware supplied for the RTCS. The second manufacturer source, if available, for all Equipment and Hardware shall be included with any exceptions noted and explained.				
68	The Contractor shall submit detailed bill of materials for the TRH including configuration instructions, including storage device mirroring, virtual private clouds or virtual machine hosts, back-up devices and configuration, and network configuration, security provisions, and testing.				
69	Prior to purchase of any Equipment and as part of its design, the Contractor shall submit the final BOM to NCTA for Approval. No Equipment shall be purchased by the Contractor prior to Approval of the BOM and the design, unless otherwise authorized in writing by NCTA authorized representative.				
70	The Contractor shall provide an initial BOM and Updates to the BOM whenever Equipment and Hardware changes occur and at a minimum on a semi-annual basis over the Contract Term. All Equipment and Hardware changes shall be subject to the Approval of NCTA.				

| No. | Requirements | Required Inputs | | | |
| | | Status | Source | If Applicable | Comments |
		B-Base Product M-Base Modified D-New Development E-Exception	P-Proposer S-Sub T-Third Party NA-Not Applicable	Subcontractor Name and/or 3rd Party Product/Vendor	Comment required if "Exception", optional otherwise.
71	The Contractor shall provide a Master Test Plan (MTP) no later than sixty (60) Calendar Days after NTP. The Master Test Plan shall also describe how The Contractor shall execute each of the test activities as outlined in these requirements. The MTP shall describe testing planned by the Contractor in each test, including entry and exit test criteria, test tools, test roles and responsibilities. The Master Test Plan shall detail how issues will be identified, documented, categorized and tracked for resolution throughout the project. The Master Test Plan shall detail how the Contractor will perform version control and their approach to regression testing application. The Contractor shall provide test procedures for OIT, SIT, and SAT at least thirty (30) Calendar Days prior to the start of each respective test. The Contractor shall provide a test report following the completion of each test, detailing the results, any observed issues and issue resolutions, including both completed and planned changes. The Contractor is responsible for all costs associated with testing outside of NCTA oversight and OBO support.				
72	The Master Test Plan shall detail the Contractor's plan to perform each of these tests: a) Factory Acceptance Test (FAT); b) Onsite Installation Testing (OIT); c) Site Installation Test (SIT); d) System Acceptance Test (SAT).				
73	The Contractor shall demonstrate performance of the system with a combination of vehicles and test transactions and simulated data provided by the Contractor. The Contractor shall provide a list of all simulators planned to be used in its Master Test Plan (MTP). The Contractor shall provide access to all test simulators and schedule a workshop at least thirty (30) Calendar Days prior to the start of FAT to demonstrate how the simulator works and validate the inputs, processes and outputs of such simulator prior to its use on the system.				
74	The Contractor shall plan and execute a test known as Factory Acceptance Test (FAT). The FAT shall validate that the system meets all functional requirements defined in this RFP and associated Business Policies through the application of use cases. The Contractor shall develop a test plan that represents the functionality of the full system end to end under real world conditions. The FAT shall include record exchanges with the OBO. FAT shall be completed and Approved by NCTA before the Contractor can move forward with installation of the first toll location. The FAT shall be conducted at the Contractor's test facilities in the continental US.				
75	The Contractor shall plan and execute a test known as Onsite Installation Test. (OIT). The purpose of the OIT is intended to validate that the system meets all functional requirements defined in this RFP when installed at the first location on the C540 Phase 2 facility. The OIT shall also configure the system to verify that the RTCS can meet all NCTA Business Policies. The Contractor shall propose any exceptions or functions that shall be simulated in the MTP. OIT shall be completed and Approved by NCTA before the Contractor can move forward with the installation of the remaining toll locations.				
76	The Contractor shall develop and implement a Site Installation Test (SIT). The purpose of the SIT is intended to validate that the installed system performs to the standards demonstrated previously in the FAT and OIT phases. This test will focus on location specific functional parameters to ensure the location has been installed and configured according to the validated design. Once SIT is completed at all locations on the project, the Contract will enter the Operations and Maintenance Phase.				
77	The Contractor shall plan and execute a performance test known as System Acceptance Test (SAT) immediately following the completion of SIT or OIT at all locations and system Go-Live. The purpose of the SAT is intended to validate that the system meets all performance requirements defined in Section 6 of Part III, Scope of Work and Requirements and does not present any critical issues for a period of sixty (60) continuous Calendar Days. The Contractor shall utilize the Monthly Performance Reports as evidence for this test.				
78	The Contractor shall provide an Interface Test Plan (ITP) prior to FAT for the NCTA OBO and ServiceNow interfaces that shall connect to the NCTA systems. The Interface Test Plan shall describe all testing required to transfer data to NCTA to meet the Requirements set forth in this Contract.				
79	The Contractor shall demonstrate data exchanges between the RTCS and the NCTA OBO and ServiceNow interfaces during FAT. The results from FAT shall be provided in the form of test cases, test procedures and actual test data from its interfaces that NCTA can use for its internal testing. The test cases shall be provided in the ITP and Approved by NCTA and should cover, at a minimum: a) success testing for normal transaction posting that test NCTA Business Policies; b) failure testing when data fails to be sent or received from the Contractor system, and, c) exception scenarios that include system behaviors in the NCTA OBO ICD that demonstrate error or failure reporting.				
80	The Contractor shall develop and submit a Training Plan for NCTA Approval in accordance with the Approved Project Schedule that describes the approach to training both Contractor and NCTA personnel in the following roles supervisors, auditors, administrators, end-users, data analysts, and support personnel.				
81	The Training Plan shall describe the plan for training new personnel and shall outline the required operational/maintenance and system knowledge for each position to be gained from the training.				
82	For each position/user type, the plan shall include a training instructor guide, training manual, and other materials to be used in training. The Training Plan also shall include a schedule for follow-up training and continuing education for staff.				
83	The Training Plan shall provide a plan for cross-training staff from other areas of operations or management for the peak period, emergency, or temporary assignments to provide for staff redundancy. The Training Plan also shall include the training schedule for regular staff training and continuing education/training.				
84	The Training Plan shall address the following areas including but not limited to: a) overall description of the training program; b) training techniques; c) training delivery schedule; d) names and descriptions of each training class; e) purpose of each training class; f) who should attend the class; g) qualification requirements for the trainer; h) minimum qualifications for personnel attending the class; i) duration of the class; j) training materials, including syllabus, schedule, training goals, manuals, guides, other support materials and techniques to be used; k) data preparation, such as users and test transactions; l) trainee assessment and scoring methods;				

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	m) trainee surveys and feedback;				
	n) required Equipment; and				
	o) facility requirements.				
85	Courses shall be limited to a maximum of eight (8) hours per Business Day for NCTA staff trained.				
86	The Contractor shall be responsible for maintaining a training database baseline and supporting data files that can be restored at the beginning of each training session.				
87	The Contractor shall provide up to 5 separate training modules to address the training needs of NCTA program to support the project. Multiple sessions of some or all modules may be required, based on demand and class size limitations. The Contractor and NCTA will determine specific training modules during the system design. *Examples of training modules might be: Maintenance Technician Training, NCTA Auditor Training, System Overview Training, and TMC Operator Training.				
88	The Contractor shall be solely responsible for supplying all items necessary, including but not limited to training documentation, Software, Hardware, and any other Equipment required to complete the delivery of the training program.				
89	The Contractor's program shall include but not be limited to instruction, presentation material, models/devices, manual, diagrams and component manuals and catalogs as required.				
90	The Contractor's training shall be hands on and use actual Hardware and Software in the training environment.				
91	The Contractor shall agree that NCTA staff, or their representatives, may attend any training sessions and may make recordings and/or copies of all training program materials for their use in training new employees.				
92	The Contractor shall provide comprehensive training for the Contractor maintenance staff, including but not be limited to, the following: a) a thorough understanding and operating knowledge of the ITSM system is required of all maintenance personnel; b) an in-depth understanding of the RTCS, design, and operations, including all Equipment, Software, interfaces, file transfers, and interconnections; c) use of maintenance documentation such as maintenance manuals, drawings, Contractor manuals, and parts list; d) functions of the RTCS monitoring tools used to manage the system monitoring tasks; e) preventive maintenance of all systems and sub-systems; f) Troubleshooting, diagnostics, repair, testing, and maintenance follow up; g) system logs, errors logs, and processing of exceptions; h) system dataflow and workflow queues; i) review of the data and analysis; j) discussion on the areas of responsibility; k) special use maintenance and monitoring tools; and l) queries and reports.				
93	The Contractor shall submit the Project manuals to NCTA for review and Approval in accordance with the Approved Project Schedule.				
94	Each manual shall include but not be limited to a title sheet; revision history; table of contents; list of illustrations (if applicable); and list of reference drawings and exhibits (if applicable).				
95	All manuals shall have a consistent look and feel and shall be professionally written and presented in clear and organized fashion.				
96	All manuals prepared for NCTA under this Contract shall be produced, or editable, using Microsoft Office 365 formats, as applicable. In addition, electronic copies of manuals shall be provided in native file format and unsecured PDF, if requested by NCTA.				
97	Any special Software required to produce scalable typefaces or other graphs shall be provided by the Contractor as part of the documentation for the manuals.				
98	The Contractor shall submit electronic copies of all manuals listed in *Table III-1: List of Manuals* below.				
99	All manuals shall be maintained in electronic format in the NCTA-provided document management system.				
100	The Contractor shall submit the RTCS Maintenance Manual prepared for properly trained technical personnel assigned to the maintenance of the Hardware and Software installed as part of this Project.				
101	The RTCS Maintenance Manual shall document information required to support roadside maintenance and repair activities, including but not limited to: a) RSS Equipment layout for each tolling location; b) schematics and layouts of the Hardware in the cabinets, Equipment racks, and the interconnection diagrams; c) parts lists required to service each piece of Hardware installed under this Project; d) a general and detailed description and concepts of RSS, and TRH operations and functions; e) detailed RTCS monitoring activities, specialty tools, and schedule; f) detailed Software monitoring activities and troubleshooting procedures; g) maintenance instructions to repair and replace parts and modules; h) mechanical functions and installation of all Hardware; i) listing of all event and error logs; j) testing and basic troubleshooting procedures; and k) preventative, pervasive, and corrective maintenance procedures.				
102	The RTCS Maintenance Manual shall document information required to support including but not limited to: a) all monitoring screens, notifications and data that needs to be checked; b) listing of all jobs/process, their dependencies, and their schedule; c) listing of all folders and directories that need to be checked; d) details related to the activity that needs to be checked; e) frequency of the validations; f) actions to take when results are not as expected; g) notification and escalation process; h) basic troubleshooting procedures; and i) creation of work orders in ITSM system.				

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103	The RTCS Maintenance Manual shall provide a description of the tools and Software for personnel to record the monitoring activity and instructions to use the tools/Software.				
104	The RTCS Maintenance Manual shall document information required to maintain and repair activities including but not limited to: a) detailed Hardware maintenance activities and schedule; b) detailed database maintenance activities and schedule; c) detailed Software monitoring activities and schedule; d) detailed monitoring procedures for file transfers and exception handling; e) detailed procedures and processes for all maintenance activities; f) detailed procedures for backup, archiving and purging of data; g) detailed procedures for testing Disaster Recovery systems; h) detailed schedule for desktop and peripheral preventive maintenance activities; i) the detailed schedule for all preventative maintenance activities; j) technical contact lists for all external interfaces and NCTA system integrators; k) Large-size logic diagrams and mechanical assembly diagrams do not have to be reduced or incorporated into the manuals if these drawings are provided with the manuals and presented in a useable and durable form; l) technical contact lists for Hardware and Software providers; and m) details and copies of all third-party system support agreements.				
105	Standard service manuals for commercial products used for the Equipment shall be acceptable if they contain sufficient information to service and maintain the Equipment properly. This information shall be included in the RTCS Maintenance Manual.				
106	Photographic documentation of Equipment with appropriate labels and callouts are satisfactory if they contain sufficient information to identify components, parts, and features properly.				
107	The Reconciliation and Audit Manual shall detail all procedures used to reconcile the data within the RTCS and audit the toll operations.				
108	The reconciliation of transactions and revenue within the RTCS and reconciliation of transactions to the NCTA OBO shall be fully described.				
109	Investigation of variances, discrepancies, unusual occurrences, and system exceptions processing shall be described.				
110	A detailed description of the screens, reports, and functions shall be provided and shall allow a qualified auditor to access, understand, and work with all financial aspects of the RTCS.				
111	A complete description of all audit procedures and a non-technical description of the screens, reports, and functions shall be provided.				
112	The manual shall contain illustrations and pictorial diagrams to demonstrate the step-by-step operations required for performing the audit and reconciliation functions.				
113	The manual shall contain QC and audit procedures to ensure that the Performance Requirements are met.				
114	Samples of all reports and analytics shall be included in an attachment to the Reconciliation and Audit Manual with any specific instructions that may be applicable to a given report and analytics. Reports and analytics included in the submittal shall have correct and accurate data, and this manual shall be used to train the auditors to validate the RTCS.				
115	The Contractor shall provide an RTCS User Manual to be used by NCTA staff to operate the RTCS as well as for training purposes.				
116	The Contractor shall develop a separate manual for each job category that details all the processes, procedures, and policies developed by the Contractor and Approved by NCTA required to fulfill the requirements of each specific job description.				
117	The manual shall include screen images detailing the step-by-step activities that need to be completed in order to fulfill a specific functionality.				
118	The manual shall not include any information that could jeopardize the integrity of toll operations or the toll collection system.				
119	Each user manual shall include but not be limited to: a) step-by-step actions to take to complete an operation; b) screen images detailing the step-by-step activities needed to fulfill a specific functionality; c) flowcharts to provide NCTA staff with a clear understanding of the workflow; d) all screens, reports, and data fields, clearly explained using sample formats applicable to the RTCS; and e) samples of all reports and analytics, included in the manual or as an attachment to the RTCS User Manual, with any specific instructions that may apply to a given report or analytics.				
120	The Contractor shall catalog all third-party documentation and include the catalog with the third-party document submissions.				
121	The Contractor shall provide and maintain the standard, commercially available, Updated documentation for third-party provided Hardware, Software, services, and materials provided under this Contract. This set of third-party documentation shall be retained at the NCTA offices for the duration of this Contract and upon the termination of the Contract.				
122	All Updated documents shall show the revisions and include a version of the clean document.				
123	An electronic copy of all third-party COTS Hardware and Software installation and user manuals, with Updates, shall be provided to NCTA. Acceptable electronic formats are Microsoft Office 2019 Suite (or most current version), unsecured PDF and professional CAD applications.				
124	Documentation shall include sufficient detail to describe the configuration of the Software as it was installed by the Contractor for the RTCS. These should include any customization or modifications made to the Software or configurations specific to the NCTA environments.				
125	The Contractor shall develop and submit a Disaster Recovery Plan and subsequent Disaster Recovery (DR) procedures that describe the approach, as well as activities and procedures that take place in the event of a disaster for each element of the RTCS.				
	The Disaster Recovery Plan shall document the Contractor's approach to recovering from a disaster, including but not limited to: a) events that constitute a disaster and party responsible for the declaration of a disaster; b) assessment of disaster risks; c) mitigation of disaster risks; d) preparations in the event of a disaster; e) disaster declaration and DR process to invoke;				

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126	f) organization chart illustrating DR team members, roles and responsibilities;				
	g) notification contact list, including contact information;				
	h) notification protocol;				
	i) sites and Equipment for DR, presented in a diagram format;				
	j) DR process initiation and completion checklist;				
	k) Software and data replication processes;				
	l) detailed logistical processes for activation of DR site and systems;				
	m) detailed technical processes for activation of DR site and systems;				
	n) detailed procedures for failover and failback of the host including a checklist for ensuring that it failed over and failed back properly;				
	o) detailed operational functions for activation of DR site; and				
	p) detailed technical processes for reactivation of primary site (or moving to a new primary site if the original primary site is destroyed), operations and systems.				
127	The Disaster Recovery Plan shall be tested no less than annually with NCTA participation. The Contractor shall schedule the test no less than twenty (20) Calendar Days prior to the start of the Disaster Recovery Plan test.				
128	The Disaster Recovery Plan test shall be successfully executed and Approved by NCTA once before entering operations.				
129	The Disaster Recovery Plan shall include an emergency response management plan, and the Contractor shall follow the procedures set forth in this plan when an emergency situation is invoked.				
130	The Contractor shall respond to any emergency and repair the RTCS, as notified by NCTA or otherwise, that may arise that has already or could potentially damage the RTCS. The Contractor shall be prepared to put forth all necessary resources to divert or correct an emergency condition.				
131	Such emergency conditions shall be handled in accordance with the policies and procedures established by NCTA. The following are a few examples of emergency conditions:				
	a) weather-related;				
	b) vehicle accident;				
	c) conditions that invoke the Disaster Recovery Plan;				
	d) third-party (power outage or communication failure);				
	e) vandalism that causes parts of the RTCS to be inoperable; and				
	f) detection of security breaches, discovered vulnerabilities and activities that pose a security threat to the toll collection system.				
132	The Contractor shall be responsible for outlining and documenting Disaster Recovery Architecture for NCTA's review and Approval. The architecture shall describe the Contractor's approach to disaster recovery, including disaster recovery procedures, in a cloud-based or virtual machine host environment should an event occur that disables or disrupts the RTCS.				
133	The Contractor is responsible for the design, procurement, installation, cabling, configuration, check-off, and testing of all Hardware, Equipment, communications, and Software and fixtures provided by the Contractor as part of the RSS at each of the tolling locations.				
134	All RSS cabinets required for this Project shall be provided new by the Contractor and replace existing cabinets, where applicable and needed.				
135	The Contractor shall work with NCTA to test the WAN and the connections to the NCTA CBOS/OBO. Testing shall include expected traffic loads and all types of production operation data.				
136	The Contractor shall coordinate all installation activities with NCTA, NCDOT, and the Constructor where applicable.				
137	Prior to the start of any installation activities the Contractor, including any Subcontractors, shall complete the safety orientation provided by the Constructor.				
138	The Contractor shall participate in the design and installation of the infrastructure on the Roadway, including but not limited to: a) review and reach consensus on all toll and ITS Equipment submittals; b) review and reach a consensus of the ITS network design provided by the Constructor; c) support and supply all information requested by the Constructor and civil designer in the form of a Request for Information (RFI); d) review and reach consensus on all Constructor-provided drawings with respect to the RSS; and e) of such drawings related to the RSS.				
139	The Contractor shall develop an Installation Plan that documents all installation-related activities for the project. The Installation Plan shall be the master document from which the elements of the RTCS shall be installed.				
140	The Installation Plan shall include and define, at a minimum, the following items: a) The installation schedule detailing all activities, shifts, and resources for the installation of the RTCS including third-party and Constructor activities. Once the baseline schedule is Approved by NCTA, the Constructor shall provide Updates during the installation periods identifying all schedule changes and work progress in the form of percentage completions shall be submitted to NCTA for Approval. b) The minimum resource allocation requirement for any installation and segment including sequencing of Toll Zone installation, testing and Go-Live. c) How the Contractor manages delivery and staging of the RTCS Equipment to be installed, including any staging, installation, and testing performed by the Contractor or third-party facilities and their subsequent delivery and installation at the production sites. d) How the Contractor will integrate Constructor provided ITS devices into their ITSM for monitoring. *Only required if the optional scope item of ITS maintenance is included in this project* e) The coordination between other contractors, including the legacy Toll System Integrator, and service providers. f) Coordination of any travel lane or shoulder lane closures with NCTA and NCDOT Division 5 for the duration of the Project. g) Coordination activities as applicable to other third-party entities for the various interfaces. h) Testing of the Contractor-provided LAN and WAN communications for connection to the NCTA provided OBO. i) QC, QA inspection, and testing processes including validation of Contractor installation to the Requirements of the Contract installation drawings. j) The order in which Equipment items are to be installed with estimated durations. k) Special or unique installation requirements. l) A detailed component list and a description of how each item version number and serial number shall be recorded for each installation and configuration into the ITSM system. m) The Contractor shall submit detailed instructions on the installation and configuration of the operating system, database, third-party Software, and application Software on the servers as customized for NCTA operations.				

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	n) A record keeping method such as the daily work reports identifying, at a minimum, the date, location, weather conditions, staff on site and classification, tasks completed, visitors, MOT, issues and resolution, and communications to other parties. These daily reports shall be delivered at the end of each work week to NCTA for review during the upcoming week installation meeting.				
	o) Contractor Organization Chart defining key team personnel, roles and responsibilities, and contact information. All Subcontractors shall be identified.				
	p) Contingency Plan: A detailed contingency plan shall be prepared for reopening closures to public traffic. A general contingency plan shall be included in the Installation Plan; however, a site-specific contingency plan shall be submitted to NCTA before work at the job site begins.				
	The Contractor's installation responsibilities for the RSS shall include but not be limited to:				
	a) Furnish and install clean, uninterruptable power to all RSS Equipment on the overhead structures/toll gantries and in the toll Equipment cabinets.				
	b) Furnish and install separate ground wires for the RSS, Surge Protection Devices (SPD), junction boxes, pull boxes, conduits, and other such items as required by the installation standards and requirements.				
	c) Furnish and install all connecting conduit from wire ways and conduits provided and installed by others and/or stubbed out conduits to the Equipment on the toll gantries. There is preexisting conduit from the toll Equipment pads to the foundation of overhead structures/toll gantries that shall be used.				
	d) Furnish and install all wiring for all in-lane Equipment and connections to the Equipment racks in roadside cabinets. This includes the proper termination of all power, communication, and RF cables and/or wiring (copper or fiber-optic) required to connect the individual components into a fully operational system as specified by the manufacturer.				
	e) Furnish, and install the cables necessary for terminating and connecting the RSS Equipment on the toll gantry to the electronics in the Equipment cabinets. Cable lengths shall include sufficient service loops to facilitate maintenance.				
	f) Furnish and install all Equipment Cabinets and Equipment racks required for the in-lane electronics and toll network communications in the toll Equipment cabinets.				
	g) Furnish and install all electronics and other devices in their respective Equipment racks as required to provide a fully operational system.				
	h) Furnish and install all Zone Controller computers and other servers (Hardware and Software) into the Equipment racks and test the connection between the Zone Controller and the TRH.				
141	i) Furnish and install all Equipment mounting brackets to support structures for the installation of all RSS Equipment on the overhead structures/toll gantries.				
	j) Furnish and install the AVDC system Equipment, overhead mounted Equipment and controllers as specified by the manufacturer. Includes all NCTA Approved materials, Equipment and supplies required to complete the system.				
	k) Calibrate and test the AVDC system in full accordance with the manufacturer's guidelines.				
	l) Furnish and install the AVI system Equipment, overhead mounted Equipment and controllers as specified by the manufacturer. Includes all cabinets and other NCTA Approved materials, Equipment and supplies required to complete the system.				
	m) Calibrate and test the AVI system in full accordance with the manufacturer's guidelines.				
	n) Time synchronize the new RSS with the AVI system, including the provision of required cables as needed.				
	o) Validate all cable and wire terminations via a test process to ensure that the cable is connected to the correct location on each end and that the cable/wire is properly terminated.				
	p) Power up and provide a field check out/installation acceptance test of all systems, to be witnessed and Approved by NCTA or its Designated Representative. Provide the completed installation checklist as described in this SOW and Requirements.				
	q) Furnish and install the ICPS Equipment, including cameras, ICPS illumination, and any video controller Equipment, sensors, Software, controllers/servers, or specialty Equipment associated with the ICPS. Configure and tune the cameras to meet the Performance Requirements of the SOW and Requirements.				
	r) Calibrate and test the ICPS in full accordance with the manufacturer's guidelines and to meet the image processing requirements specified in the SOW and Requirements.				
	s) Furnish, install, calibrate, and test the DVAS cameras and Equipment.				
	t) All other items, materials, and Equipment to complete installation in accordance with the Contract.				
142	The Contractor shall develop an installation checklist that tracks the progress and completion of all RTCS installation activities for the RSS and TRH.				
143	The checklist shall be the document detailing those items required for the installation crew and technical team to complete the installation process for all Equipment and components, including terminations, connections, and configurations.				
144	A copy of the checklist signed and Approved by the Contractor, attesting to the completeness of the installation, shall be provided to NCTA after the completion of the installation activities for each lane at each Tolling Location.				
145	The Contractor shall conduct a final inspection of all installations and certify the installation work.				
146	NCTA reserves the right to obtain the services of a certified engineer to witness the Contractor inspection and conduct an independent inspection. The Contractor shall coordinate and support such inspections at each tolling location.				
147	The checklist shall identify all non-conformances, discrepancies, and exceptions, and the Contractor shall be responsible for all corrections.				
148	The checklist shall document all changes identified during the installation process, and all such changes shall be Approved by NCTA or its designated representative.				
149	Electrical work to be performed under this Contract shall include, but not be limited to the following general items of work:				
	a) Provide and install Surge Protection Devices (SPD) as required to protect all toll collection Equipment and electronics.				
	b) Install junction boxes and terminate new cable and conduit attachment devices, where applicable.				
	c) Bond all conduits, manhole frames, and other conductive items to the grounding system in conformance with the NEC.				
150	All electrical work shall be performed in accordance with the applicable regulations and Approved by NCTA and NCDOT. Appropriate NEC compliance shall be adhered to with all electrical articles for installation pertaining to wiring, enclosures, and other electrical Equipment in hazardous locations. UL labels shall be provided for all electrical panel boards, enclosures, and accessories.				
151	All electrical Equipment shall be inspected prior to installation for defects that could damage the Equipment or harm personnel. Any Equipment found to have defects shall not be installed but shall instead be replaced with a fully functioning replacement.				
152	All electrical Equipment shall be properly grounded for safety. Equipment shall be furnished with grounding pads or grounding lugs. All ground connections shall be cleaned immediately prior to connection.				
153	The Contractor shall provide all grounding material required for installation of the Contractor Equipment and all installations shall be in compliance with the applicable standards.				

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154	The Contractor shall cooperate with NCTA and NCDOT, as applicable, to minimize the required number of lane closures and to maximize the use of other scheduled lane closures. The Contractor shall transmit all lane closure requests to NCTA for Approval.				
155	The Contractor shall work with NCTA and agree to a reasonable plan for scheduling and approving lane closures, including a procedure for advance notice of cancellations of lane closures and allowable conditions for such cancellations as described in this SOW and Requirements.				
156	For all lane closures, the Contractor shall conform to the latest versions of the NCDOT Standard Specifications for Roads and Structures and the NCDOT Roadway Standard Drawings for regulations for MOT activities during the maintenance period. The NCDOT Standard Specifications for Roads and Structures and the NCDOT Roadway Standard Drawings are located at:https://connect.ncdot.gov/resources/Specifications/Pages/default.aspx				
157	By 12:00 p.m. Tuesday, the Contractor shall submit to NCTA and NCDOT a written closure schedule that details the schedule of planned closures for the following week period, defined as Sunday 12:00 p.m. through the following Sunday 12:00 p.m.				
158	The closure schedule request shall show the locations and times of the proposed closures. The closure schedule shall be submitted in the format requested by NCTA and NCDOT and shall be made in accordance with NCDOT lane closure requirements and in observation of the lane closure restriction for designated legal holidays. All lane closure restrictions and requirements are detailed in **Attachment 7: Lane Closure Restrictions** to this RFP.				
159	Closure schedules requests submitted to NCTA with incomplete or inaccurate information shall be rejected and returned for correction and resubmittal. The Contractor shall be notified by NCTA and/or NCDOT of disapproved closures or closures that require coordination with other parties as a condition of Approval.				
160	Closure schedule request amendments, including adding additional closures, shall be submitted by 12:00 p.m. to NCTA and NCDOT, in writing, at least three (3) Business Days in advance of a planned closure. Approval of closure schedule amendments shall be at the discretion of NCTA. NCTA will be notified of canceled closures two (2) Business Days before the date of the closure. Closures that are canceled due to unsuitable weather may be rescheduled at the discretion of NCTA.				
161	The Contractor shall schedule, manage, and attend weekly installation meetings during the active design and installation of the Project and report on the progress of the installation. The Contractor shall identify and communicate any issues regarding system installation and transition immediately upon discovery to NCTA.				
162	The Contractor shall ensure that the appropriate personnel is present at these meetings who can represent the Contractor's interest and provide the information necessary in a meaningful manner.				
163	Prior to the meeting, the Contractor shall Update the installation schedule based on the construction schedule, and all changes shall be identified.				
164	The Contractor shall prepare and distribute a meeting agenda at least forty-eight (48) hours prior to the scheduled meeting. The meeting agenda shall consist of those items pertaining to the installation and schedule for the previous and current week's installation efforts and for an agreed to "look ahead" period. The meeting agenda should include any potential risk items identified and corresponding mitigation efforts.				
165	It is the Contractor's responsibility to make sure all issues that arose during the installation activity for the week are addressed and resolved or are scheduled for resolution.				
166	At these meetings, the Contractor shall also be prepared to address any issues or questions raised by the Constructor, other contractors, and NCTA or its representatives.				
167	The Contractor shall document the meeting discussions and distribute the meeting minutes within one (1) Business Day to everyone from the team invited to the meeting. It shall be up to the recipients of the meeting minutes to distribute to other interested parties. The Contractor shall also record and maintain an action items list that tracks all installation-related issues.				
168	The Contractor shall meet all electrical codes, traffic control, seismic considerations, calibration, configuration, and environmental requirements of and including but not limited to: a) Equipment manufacturer's; b) National Electrical Code (NEC); c) UL standards; d) NCTA; e) NCDOT; f) FHWA; g) MUTCD; h) IEEE (Institute of Electrical and Electronics Engineers); i) OSHA requirements; and j) any local authorities having jurisdiction.				
169	The Contractor shall adhere to the latest NCDOT Roadway Standard Drawings and the latest NCDOT Standard Specifications. The NCDOT Standard Specifications for Roads and Structures and the NCDOT Roadway Standard Drawings are located at:https://connect.ncdot.gov/resources/Specifications/Pages/default.aspx				
170	The Contractor shall be responsible for all costs associated with any permits, plan reviews, and inspections related to RSS work.				
171	It shall also be the Contractor's responsibility to procure all documentation required to install and adhere to the proper installation standards, law, ordinance, or codes.				
172	The Contractor shall procure services of Subcontractors qualified to work in this industry. If a Contractor's component requires a Contractor-Approved installer, the Contractor shall use an Approved component installer, including qualified Contractor staff.				
173	The Contractor shall provide a Transition Plan for NCTA Approval that addresses the transition of the RTCS into revenue collection				
174	The Transition Plan shall address all critical transition elements and activities associated with the installation and implementation of the RTCS, including the RSS; TRH, and interfaces to the existing NCTA OBO.				
175	The Transition Plan shall address the integration and interface of the RTCS to existing interfaces/Equipment (if applicable).				
176	The Transition plan shall detail all communication protocols to be used throughout the transition process.				
177	Any temporary processes implemented to support the transition shall be documented in the Transition Plan including eventual replacement process if applicable.				
178	All points of coordination or reliance on third-party Deliverable, for example the WAN communications network, shall be clearly identified in the Transition Plan.				
	In order to ensure a seamless transition, the following activities shall take place prior to opening the Tolling Locations in revenue collection.				

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179	a) The TRH shall be installed and Commissioned at the primary and secondary locations and its interface to the existing NCTA OBO shall be validated;				
	b) NCTA shall confirm the existing NCTA OBO is ready for conversion and give Approval for Go-Live. At such time, the Roadway System shall be switched to production mode and ready to begin collecting revenue;				
	c) Upon Approval to proceed with an OIT or SIT, the Contractor shall conduct such test at each Tolling Location prior to opening each location to revenue collection.				
	d) The MOMS shall be configured for Go-Live; inventory recorded; technicians scheduled, and notifications set up;				
	e) The DVAS shall be installed and validated and Authorized NCTA personnel shall have access to the DVAS;				
	f) The OIT shall be conducted and System functionality and performance validated at the OIT Tolling Location.				
	g) An end-to-end test shall be conducted in the RTCS and existing NCTA OBO test environments to validate the flow of transactions and images from the Roadway System to the existing NCTA CSC Back Office.				
180	The Maintenance Plan defines the approach to services, staffing, and resources to fulfill the maintenance requirements. The Maintenance Plan shall include: a) organizational structure, organizational chart, and job descriptions and responsibilities; b) detailed matrix of responsibilities (NCTA and Contractor); c) staffing plan; d) approach to staffing and training; e) detailed system monitoring requirements; f) coverage and personnel locations; g) third-party system support agreements overview; h) schedule of all system maintenance activities; i) all system maintenance related communication methods; j) maintenance procedures, communication protocols, and Approval processes for system and Software Upgrades, scheduled maintenance activities, Software releases, change management and scheduled downtime; k) maintenance procedures and communications protocols for unscheduled downtime; l) communication protocol for coordination with NCTA operations and third-party entities; m) communication protocol for coordination with NCTA's existing system integrators; n) trouble reporting processes; o) escalation processes; p) spare parts levels and reorder thresholds, Equipment and Software warranty tracking and return material processes; q) monitoring the ITSM dashboards; r) monitoring maintenance performance for compliance to Performance Requirements; s) sample maintenance reports; t) Equipment obsolescence/replacement/refresh schedule; u) Upgrades to third-party Software and tools; v) process in place to meet maintenance Performance Requirements; and w) pervasive methodology and activities.				
181	The Maintenance Plan shall detail the Contractor's Software maintenance and warranty program including the approach to services, staffing, and resources to fulfill the Software maintenance requirements including but not limited to: a) all Software maintenance related communication methods; b) approach to receiving and prioritizing Software defects (bugs); c) reporting, categorization, prioritization, remediation and disposition of Software defects; d) maintenance procedures, communication protocols, and Approval processes for Software Upgrades, Software releases, testing, scheduled maintenance activities, change management and scheduled downtime; e) Software Updates and testing to comply with interoperability specification changes, and third-party interface changes; f) Software and security Updates, remediation and testing to be compliant to NCTA Audit Requirements; and				
182	The Maintenance Plan shall detail the Contractor preventative maintenance program in accordance with this SOW and Requirements.				
183	The Contractor shall provide a preventive maintenance schedule as part of the Maintenance Plan. The schedule shall detail the preventive maintenance to be performed on each Equipment item and system. The schedule shall provide a description of the work to be performed, expected duration, and the frequency.				
184	After the Approval of the System Acceptance Test (SAT) and prior to NCTA acceptance of the RTCS, the Contractor shall submit the As-Built SDDD that includes all Software and Hardware changes made during the RTCS development, implementation, and testing.				
185	The Contractor shall Update the latest drawings with red lines as changes are incorporated during the installation and check-out process. At the completion of the installation of the RTCS, the Contractor shall gather all red line drawings into a single package.				
186	The red-line drawings shall be verified and then incorporated into a final As-Built Drawing package. This final As-Built Drawing package shall include installation drawings, shop drawings and sketches, and other drawing types that may have been used to install the RTCS.				
187	All other documentation used regarding the installation shall also be finalized and submitted as part of the As-Built Drawing submittal.				
188	Upon NCTA's written notice, the Contractor shall furnish transition services prior to the end of the Contract Term. The Contractor shall develop with the successor contractor or NCTA staff, a Contract Transition Plan describing the nature and extent of transition services required.				
189	The Contract Transition Plan and dates for transferring responsibilities for each division of work shall be submitted within thirty (30) Calendar Days of such notice. Upon completion of NCTA review, both parties shall meet and resolve any additional requirements/differences.				
190	The Contractor shall provide sufficient experienced RTCS technical and Software support personnel in each division of work during the entire transition period to ensure that the quality of services is maintained at the levels required by this Contract.				
191	The Contractor shall provide sufficient staff to help the successor maintain the continuity and consistency of the Services required by the Contract. The Contractor shall allow the successor to conduct onsite interviews with the employees.				
192	The Contractor shall provide the necessary Software and systems support services to assist the successor contractor in setting up the systems, transfer of appropriate licenses and third-party Software, and transition of all data required to sustain uninterrupted service as directed by NCTA.				
193	The Contractor shall make all necessary provisions for transferring any leases or sub-leases held by the Contractor to NCTA, including without limitation, all keys, security codes, and other codes and other facility access information or devices.				

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194	The Contractor shall make all other records, documents, data, and Software which are licensed to NCTA and pertaining to the Services rendered for this Agreement available within thirty (30) Calendar Days upon written notice or as otherwise provided in the executed license Agreement.				
195	The Contractor shall make all operational records, documents, data, systems, specialty tools and Equipment, and facilities required to support and maintain daily services being rendered under this Agreement available before the date of such termination, suspension, or expiration.				
196	The Contractor will be provided access to available strands on the fiber network as detailed in **Attachment 4: Infrastructure Design Drawings**.				
197	The Contractor shall provide cellular antennas and routers to integrate into their system. These devices may be used to aid the implementation and shall remain in place during Operations & Maintenance Phase for redundancy.				
198	The Contractor shall provide all equipment and materials necessary to complete a fully redundant network using the provided fiber, vendor provided cellular infrastructure, cabling, patch panels, switches, firewalls and ISP circuits.				
199	NCTA Business Policies for NC Quick Pass and Roadside includes operations concepts, business policies, business rules and concept of operations for this Project and the NCTA systems roadside and customer service center and can be found in Attachment 1: NCTA Business Policies. All specific requirements that differ or expand upon these documents are included in this Part III, Scope of Work and Requirements. NCTA may update the NCTA Business Policies from time to time throughout the Contract Term. The Contractor shall review and adhere to all Business Policies. The Contractor may request reimbursement from NCTA if new functionality not contemplated in the Requirements is added to meet new Business Policies in accordance with the dispute resolution provisions as outlined in this Agreement.				
200	All Hardware and Equipment supplied under this Contract shall be new, Commercial Off-the-Shelf (COTS). Materials and products that have been previously used for development work or the Contractor's internal Formal testing, or items that have been salvaged or rebuilt shall not be used in connection with this Contract.				
201	The RSS shall meet all functional requirements in all weather and lighting conditions.				
202	The RSS shall accurately capture and identify all vehicles that pass through the toll zone.				
203	The RSS shall be designed to ensure redundancy for critical functionality related to revenue collection.				
204	The RSS shall accurately identify the lane location of each transaction or buffered Transponder Read and identify if the vehicle straddled an adjacent lane or shoulder.				
205	The RSS shall assign a timestamp to all transactions or buffered Transponder records. The timestamp shall be associated with a defined event in the transaction formation process, to be determined during the design process.				
206	The transaction images produced by the RTCS shall support the OBO ICD and shall provide readable images of properly mounted and unobstructed license plates.				
207	The RSS shall accurately measure and report the travel speed for each vehicle associated with a Toll Transaction.				
208	The RSS shall use only gantry mounted equipment. No in-pavement sensors will be permitted.				
209	The RTCS shall support accurate assignment of fare to each transaction.				
210	All RTCS Software developed, furnished, and installed under this Contract shall be warranted, by the Contractor, against Software defects, security vulnerabilities, and deficiencies for the life of the Project.				
211	RTCS elements and subsystems shall be designed and installed in a manner that minimizes the need to close toll lanes for routine maintenance and minimizes the duration of any lane closures for maintenance.				
212	The Contractor shall provide, manage, and maintain all network Equipment within the RTCS and required to interface outward; including servers, switches, routers, and firewalls, and all network cabling.				
213	The RTCS shall include a minimum of two (2) network time servers each synchronized to a minimum of three (3) independent stratum 1-time servers.				
214	The RTCS shall synchronize all components of the RSS to within 1/1000 of a second.				
215	The RTCS shall support monitoring and collection of data on system and Equipment statuses continually 24 hours a day, 7 days a week.				
216	The RTCS shall generate a video record for all transactions generated using a frame rate and video quality that supports accurate identification of the vehicle and covers its complete traverse through the toll zone.				
217	The RTCS shall have a separate input for vehicle detection other than the AVDC system that will be used to identify variations and anomalies in the system's ability to detect vehicles.				
218	The DVAS shall provide continuous video recording of the lane(s) at all times and retain the video recordings as defined in Part III, Section 5.5 Data Retention.				
219	All Toll Zones shall be capable of processing and creating lane transactions for a minimum 2,000 vehicles per lane per hour with no loss of data and with all vehicles with front and rear license plates and an AVI Transponder. Simulation Software shall be accepted as a method of compliance with this requirement to ensure the system is properly sized, coded and configured to achieve the highest level of system efficiency for processing all types of transactions that shall be processed on the NCTA toll roads.				
220	The RSS shall provide supplemental illumination (if needed) for image based (Toll Invoice) tolling that does not interfere with vehicle travel or distract drivers and shall not cause light pollution to areas adjacent to the roadway.				
221	The RTCS shall not delete any information included in the lane transaction. Data in the lane transaction can only be created and amended.				
222	All transactions shall be uniquely identified within the RTCS.				
223	When multiple Transponders are detected within a vehicle the system shall include all detected transponders in the transaction sent to the OBO.				
224	The RTCS shall generate records for all buffered Transponder reads.				
225	The RTCS shall allow toll lanes operational modes to be changed by authorized users from the operations center.				
226	All in-lane Equipment controllers and RSS electronics, devices, servers, and associated communications Equipment shall be installed inside environmentally controlled Equipment cabinets at the roadside. The Contractor shall purchase and install the cabinets per the Requirements of this Contract.				
227	All cabinets and enclosures that shall be installed outdoors shall be designed to withstand typical North Carolina area environmental conditions and shall not suffer any visible or functional degradation over the term of the Contract.				
228	The cabinets shall have monitoring sensors (including humidity and temperature), and if environmental conditions inside the cabinets exceed the configurable threshold, alarms shall be generated and reported to the ITSM system. There shall be no loss of data in such conditions, and the integrity of the RSS shall be maintained.				
229	Access to all Equipment cabinets shall be recorded automatically and reported to the ITSM system. The data reported shall include, but not be limited to cabinet status, date, time of door open, time of door close, and any applicable alarm conditions.				

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230	The Contractor's services shall be designed, developed, implemented and maintained in a manner consistent with security requirements, defined as the requirements levied on Information Environments that are derived from laws, Executive Orders, directives, policies, standards, instructions, regulations, procedures, or organizational mission/business case needs to ensure that security and privacy protections are implemented in the collection, use, sharing, storage, transmittal, and disposal of information. Security requirements shall be supported in a manner that makes verification possible via analysis, observation, test, inspection, measurement, or other defined and achievable means. The Contractor shall meet the following requirements (where applicable): •18 U.S. Code § 2721 — Driver's Privacy Protection Act •N.C.G.S § 143B-1375 — Security •N.C.G.S § 143B-1376. Statewide security standards •N.C.G.S. §143B-1331 — Business Continuity Planning •Functional Schedule for North Carolina State Agencies •North Carolina Statewide Information Security Manual •NCDOT Policies, Standards, Guidelines and Procedures •NCDIT-T Policies, Standards, Guidelines and Procedures •NCTA Policies, Standards, Guidelines and Procedures NC Statewide Information Security Manual can be currently viewed at: https://it.nc.gov/statewide-information-security-policies The policy regarding data classification and handling can be currently viewed at: https://it.nc.gov/documents/statewide-policies/statewide-data-classification-handling-policy/open The Functional Schedule for North Carolina State Agencies can be currently viewed at: https://archives.ncdcr.gov/government/state-government-agencies/functional-schedule/functional-schedule-search-guide The definitions in the Statewide Glossary of Information Technology Terms apply to all statewide information technology policies and standards and can be currently viewed at: https://it.nc.gov/documents/statewide-glossary-information-technology-terms The NIST Glossary of Information Technology Terms can be used to supplement the Statewide Glossary of Information Technology Terms and can be currently viewed at: https://csrc.nist.gov/glossary. Any exceptions to the standards described in this Requirement above and in Attachment 2: State of North Carolina, Statewide Information Security Manual shall be described in its Proposal by adding Appendix 3 in the Proposer's Technical Proposal Section 7. The Contractor shall describe any exception to the security policy and why they are exempt. The Contractors shall identify only of those exceptions within the policy with an explanation. Categorical exception to the policy shall be considered non-compliance.				
231	The RSS shall capture at least one front and one rear unique color image of the vehicle and its license plate(s) for every vehicle that passes through a travel lane within a Toll Zone.				
232	The RSS shall capture at least one rear unique color image of the vehicle and its license plate(s) for every vehicle that passes through a shoulder within a Toll Zone.				
233	The RSS shall use a global shutter camera, equipped with a varifocal lens capable of framing a full 12-foot-wide lane plus allowances for mounting variations and a minimum plate width of 250 pixels.				
234	The histogram of the captured license plate region of interest (ROI) shall exhibit a bimodal distribution, with a minimum separation of 40 intensity levels (on an 8-bit scale) between the mode of the character pixels and the mode of the background pixels in the image transmitted to the OBO with no adjustments.				
235	The histogram of the captured license plate region of interest (ROI) shall not exhibit "Left-Walled" or "Right-Walled" data indicating lost detail due to over or under exposure in the image transmitted to the OBO with no adjustments.				
236	The RSS shall minimize image distortion by utilizing a maximum allowable pan or tilt angle for image capture of 30 degrees from the angle of incidence with the plate.				
237	The Contractor shall cooperate with NCTA's OBO provider on image characteristics such as contrast, sharpness and clarity to optimize OBO ALPR performance.				
238	The camera shall produce clear images that are without artifacts that impact the ability to read and process license plates.				
239	The camera shall not produce visual artifacts due to vehicle and infrastructure lights, the sun, and reflections of vehicles.				
240	The transaction images produced by the RTCS shall support the OBO ICD (found in **Attachment 6**) and shall provide readable images of properly mounted and unobstructed license plates.				
241	The RSS shall capture properly mounted transponders and accurately correlate them to their associated vehicle as they pass through the toll zone in a travel lane (shoulders excluded).				
242	The AVI system shall detect and read all toll transponders to determine the tag agency, tag protocol, and unique transponder ID in accordance with the NCTA interoperability and business rules. The AVI system shall accurately correlate all properly mounted transponders to the correct vehicle. These integration requirements shall include all the following anticipated protocols to be supported by the RSS in no specific order of precedence: a) IPS111 (TDM/IAG E-ZPass Group); b) ISOB_8oK (SeGo); and c) ISOC (ISO 18000-63/6C).				
243	The AVI system shall use only Approved Equipment from current contracts as listed on the E-ZPass website, linked here, that meet the Requirements of this Project.				
244	The Contractor shall furnish and install all Hardware, cabinets, cabling (including RF, communication, and power cables), connectors, and associated mounting fixtures to form a fully functioning AVI system that meets the Requirements of this SOW.				
245	The Contractor shall be responsible for the physical tuning AVI Equipment, and for integrating the AVI system into the Contractor in-lane design. All AVI installation, configuration, and tuning shall be in compliance with the AVI vendor requirements.				
246	The RSS integrated with the AVI system shall process Transponders mounted on vehicles traveling in stop and go and bumper-to-bumper traffic and vehicles traveling at speeds of up to 100 mph.				
247	The RSS shall perform 6C UII Validation and associated transponder read handling as defined in **Attachment 1: NCTA Business Policies**.				
248	The RSS for shall accurately detect the number of vehicle axles and include all data in the Toll Transaction.				
249	The RSS shall accurately measure and report the length, width and height of each vehicle associated with a Toll Transaction.				
250	The AVDC system shall determine the vehicle axle count as well as vehicle length, height and width to classify vehicles in accordance with the NCTA vehicle classification structure for all travel lanes and shall include the logic to handle the exceptions identified. Classification of vehicles traveling on the shoulder lanes is not required; however, the RSS shall detect vehicles that travel on the shoulder and trigger the Image Capture & Processing System (ICPS).				

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251	The AVDC system shall be of non-invasive type, not requiring direct installation via core cuts, saw cuts, or other installation method that impacts the road surface.				
252	The NCTA vehicle classification structure for AET Lanes is defined as: i. Class 1 defined as a vehicle with 2 axles ii. Class 2 defined as a vehicle with 3 axles iii. Class 3 defined as a vehicle with 4 or more axles				
253	The AVDC system shall be provided with a redundant design that allows the subsystem to continue to operate and meet all functional requirements while experiencing any single point of failure.				
254	In the event of a power interruption, the Zone Controller shall open in the operational mode it was in before it was powered down.				
255	Authorized users shall be able to configure the operational mode both locally and remotely. Each time a mode change is requested, an alert message shall be sent to the ITSM system.				
256	When a lane is operating in a mode other than normal open mode (to be finalized during design), an alert shall be generated and sent to ITSM system at regular (configurable) intervals.				
257	The RTCS shall support various modes of operation that are managed and initiated by authorized users through the host.				
258	Transactions shall be processed according to different NCTA Business Policies either at the RSS level or the host level based on the mode of operation and the facility type. The Contractor shall be responsible for ensuring that all transactions are processed according to **Attachment 1: NCTA Business Policies** for NC Quick Pass and Roadside and transmitted correctly to the existing NCTA OBO.				
259	The RTCS shall provide functionality to operate in the following modes of operations: a) Open mode: All transactions shall be processed normally in an open mode; b) Maintenance mode: Transactions created in maintenance mode are processed as normal transactions but are identified as maintenance mode transactions and transmitted to the host. Transactions that occur during maintenance mode are not reported as traffic or revenue transactions; and c) Emergency mode: Transactions created during emergency mode shall be identified as emergency mode transactions and processed in accordance with NCTA Business Policies for NC Quick Pass and Roadside to be determined during the design.				
260	The RTCS shall provide determination of the fare class at the tolling location or other supplemental systems prior to posting to the OBO based on the vehicle class.				
261	The fare class shall be determined in accordance with NCTA business rules and may vary by lane status including lane open, maintenance or closed statuses.				
262	The RTCS shall have a configurable default fare class to be used in the event classification data is not available.				
263	Tolls shall be assessed using the toll rates established for each tolling point. The RTCS shall support the toll rate and the NCTA vehicle classification structure based on the Toll Zone and facility. The initial toll rates shall be defined during RTCS design and shall be configurable to support periodic rate adjustments as Approved by NCTA.				
264	Images shall be captured and saved for all transactions, regardless of operating mode in accordance with the NCTA data retention policy as defined in Part III, Section 5.5 Data Retention.				
265	Images saved during ICPS loss of communication event shall be flagged and subsequently matched with the correct transaction data when communications resume with the Zone Controller. This matching can occur at the host but shall take place in a manner that does not interfere with or degrade real-time Zone Controller operations.				
266	In the event that the system captures vehicle images without any other supporting system data such as AVDC, these images shall be saved such that all non-valid Transponder transactions that occur during the AVDC malfunction can be subsequently pursued for collection. Sufficient data, such as image capture time stamps, shall be provided in the transactions to allow the TRH and OBO to process such transactions so that customers are not charged in error when lane operation is degraded.				
267	All parameters and settings required to run the Zone Controller application shall be maintained in configuration files. Access to configuration files required to support the Zone Controller operations shall be controlled, and access to these files shall be limited to authorized personnel.				
268	The configuration files shall be maintained at the host for configuration and version control. All Zone Controllers shall have default configuration files that shall allow the lane to start-up automatically.				
269	Authorized personnel shall be able to make changes to parameters and settings that are defined as configurable in this SOW and Requirements and in the Approved design documents. Authorized personnel shall be able to make changes to the configuration files in the field. Changes to configuration files shall be recorded in the ITSM. All changes made to the configuration files in the field shall be synchronized to the master configuration file that is maintained at the host.				
270	Each Zone Controller shall automatically back up its critical configuration files to a back-up server to be used to rebuild the master drive in the event of hard disk failures.				
271	The RTCS shall support exception handling in accordance with the NCTA business rules. Alarms shall be generated and reported to the ITSM system for all exceptions/errors.				
272	All messages generated at the Zone Controllers shall be transmitted to the host in real-time using a transport mechanism that performs error detection and correction to guarantee data transmission. All messages shall be uniquely identified and validated at the host to ensure there are no missing or duplicate messages. Failure of transmission of data to the host shall result in the generation and transmission of an alarm message to the ITSM system.				
273	All messages shall be confirmed as received by the OBO before they are flagged for write-over. In the event of communication failures, the messages shall be stored on the Zone Controller until the successful transmission is complete and verified.				
274	The Zone Controller shall transmit to the TRH or OBO all data, including but not limited to those identified below: a) all transaction messages generated in the lanes; b) all alarm and status messages generated in the lanes; c) all lane operational, communication status and self-health messages; d) all events generated in the lanes that are displayed on the roadway operations monitoring screen or are required at the host; and e) all events required by the DVAS for real-time review or playback.				
275	All RSS Software shall be downloaded to the Zone Controllers from the host, and versions on each Zone Controller shall be maintained, tracked, and recorded.				
276	The RSS shall institute checks whereby it detects issues with the data it receives from the host, including but not limited to: a) incorrect versions of the data received; b) corrupted data received; and c) missing files when a file was expected.				
277	The RSS shall support exception handling in accordance with the NCTA Business Rules Approved during the design. Alarms shall be generated and reported to the ITSM system for all exceptions/errors.				

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278	Each Zone Controller shall self-monitor the system health of internal components and all associated in-lane Equipment devices for status. All RSS components, including AVI system, AVDC system, and ICPS, shall be continuously polled for status. The health of some digital devices shall be inferred from events.				
279	The RTCS shall generate a recovery message and restore its operational status if a device recovers after reporting a failure. Recovery messages shall be recorded against the original failure work order, shall be reported through the ITSM system, and shall be available to authorized staff. Recovery messages shall not close the associated failure/work order but shall serve as supporting evidence of an Equipment recovery.				
280	All alarm, health, and recovery messages shall be transmitted and reported to the ITSM system.				
281	If communications from the Zone Controller to any host is unavailable, an alarm message shall be generated and reported to the ITSM system.				
282	If the lane is operating in any mode other than the normal open mode, an alert message shall be generated at configurable intervals and reported to the ITSM system.				
283	The Zone Controller shall operate in a stand-alone mode for a minimum of ninety (90) Calendar Days if communications to the host is down. When operating in stand-alone mode, the last files downloaded from the host shall be used for processing vehicles.				
284	The Zone Controller shall have an available data port to permit onsite manual uploading of Software or other pertinent data required for continued operation until communications with the host is re-established.				
285	Upon re-establishing communications with the host, all back-logged messages, including manually transferred messages, shall be transmitted and synchronized to the host without affecting the real-time operations or degrading the lane operations.				
286	The Contractor shall provide an Access Control and Monitoring System (ACSMS) to monitor access to the cabinets and toll site area.				
287	The ACSMS shall provide a central management user interface for a user to remotely view security events and related videos. The interface shall provide convenient navigation of security events and related videos.				
288	The ACSMS shall provide an overhead camera that captures the cabinet pad area and parking area and is capable of flagging video associated with alerts for events such as a cabinet door opening or movement after hours.				
289	The ACSMS shall provide a camera (or multiple cameras) in each cabinet that captures individuals accessing the cabinet from each door. The cameras shall record video triggered by events such as the door opening or motion detection.				
290	All cabinets on the project shall share a single key that is unique to the project and not widely available (such as a number 2 key).				
291	The Contractor shall integrate Constructor provided Automatic Transfer Switch (ATS) that will detect a utility power outage and activate the Constructor provided generator to power the RSS.				
292	The RTCS shall monitor the ATS and monitor ATS status and power status.				
293	The RTCS shall monitor generator status (on/off).				
294	The RTCS shall monitor and report generator fuel levels and provide remote access to this information.				
295	The Contractor shall implement a power circuit design that routes all power from both utility service and the generator through the ATS and the UPS to be conditioned upstream of all RSS and RSS supporting equipment.				
296	All roadside Hardware and Equipment required to operate the RSS shall be on UPS. The UPS shall be supplied by the Contractor.				
297	The UPS shall be capable of receiving power from the utility power service and the backup generator provided by the Constructor.				
298	The Contractor shall interface with the transfer switch and the Contractor-provided smart Power Distribution Units (PDUs) in the toll cabinetry to manage the roadside power distribution. Maintenance technicians shall have remote access to manage power to critical devices.				
299	The UPS shall support the RSS at each tolling location for a minimum of 2 hours on battery.				
300	The UPS shall provide all critical status updates to the ITSM including on battery, low battery and critical low battery.				
301	When utility power is restored, and Hardware/Equipment is no longer on the UPS, a notification shall be reported to the ITSM system.				
302	The RTCS shall alert TMC personnel via email within 10 seconds of a vehicle passing through a toll zone travelling in the wrong direction. The email shall identify the location and time of the event and include a link to a video recording of the event.				
303	The RTCS shall alert TMC personnel through a Contractor provided user interface within 10 seconds of a vehicle passing through a toll zone travelling in the wrong direction. The user interface alert shall be prominently displayed on the operator's monitor and include the time and location of the event and a five (5) second looping video of the vehicle passing through the zone.				
304	The WWVD alerting system shall be capable of interfacing with third party systems provided by NCTA, such as a unified Advanced Traffic Management System.				
305	The TRH shall be hosted in the cloud or virtual machine host and accessible to NCTA via a virtual private network Approved by NCTA and operate on any commercially available web browser application.				
306	The TRH shall include redundancy in the TRH (including transaction processing, reporting, and system monitoring) expandable to other NCTA facilities in the future if NCTA decides to consolidate or move any of its facilities.				
307	The TRH shall be designed to allow for transaction processing, reporting processing, as well as system monitoring and auditing processing to occur simultaneously.				
308	The Contractor shall provide, manage, and maintain all RTCS network Equipment including servers, switches, routers, and firewalls, and all network cabling required to operate the RTCS.				
309	The Contractor shall provide an IT Service Management System (ITSM) that monitors the RTCS and addresses all related requirements in this Contract.				
310	The RTCS shall monitor and collect data on system and Equipment statuses continually 24 hours a day, 7 days a week.				
311	The TRH shall provide an interface to access recorded color video of every toll lane and Toll Zone that allows for the visual identification of vehicle size and number of axles and length at all times of the day and under all environmental conditions. The frame rate shall be sufficient to clearly identify vehicle characteristics to support an audit.				
312	The Contractor shall provide associated data for Toll Transactions captured from the RTCS and sent to the NCTA OBO. The Contractor shall provide a Toll Transaction that is compliant with OBO to RTCS ICD as outlined in **Attachment 6: OBO ICD**. Refer to the current Interface control document as a reference for number of Web services and minimum data exchange elements. The Contractor shall describe its existing interface in its Technical Proposal.				
313	The RTCS shall be capable of transmitting transaction records to the OBO in near real time from when the transaction is formed in the lane.				
314	The RTCS shall be capable of implementing a delay to the delivery of transaction records to the OBO through a simple configuration setting.				
315	The RTCS shall conform to **Attachment 6** for the transfer of Toll Transactions and all other necessary data from the TRH to the NCTA OBO.				
316	All transactions shall be uniquely identified and validated within the RTCS to ensure there are no missing or duplicate transactions prior to sending to the NCTA OBO.				
317	When multiple Transponders are detected within a vehicle the TRH shall include all detected transponders within the transaction record sent to the OBO.				
318	The RTCS shall account for every lane transaction that is the result of a buffered Transponder read for tracking and disposition which shall be reported to and auditable by NCTA.				

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319	Transponder reads buffered during lane degradation where no other information or images are captured shall be sent to the NCTA OBO for processing as a transaction at the lowest toll class.				
320	The RTCS shall provide function to review the transaction accuracy, including the Toll Transactions sent to the OBO as well as transactions that were retained in the TRH for the purpose of: a) Audits conducted by the Contractor or NCTA and its agents. b) Provide an application or filtering capabilities that allows the Contractor or NCTA and its agents to select problem plates to be added to queue that requires manual image verification. The plates shall be added by the image verification Software or manually by an authorized user in the system. c) Support existing NCTA review and auditing processes to measure the system against the Performance Requirements. d) The Contractor shall be able to filter transactions including, but not limited to: 1. ALPR confidence levels 2. ALPR results based on location and Jurisdiction 3. Filtered criteria based random sampling for QA/QC (every XX transactions) 4. System exceptions as defined in this SOW and Requirements 5. Unusual occurrences as defined in this SOW and Requirements 6. Location 7. Date and Time				
321	The RTCS shall map transactions that are not subjected to audit for accuracy, defined as System Exceptions, including but not limited to: a) Auto flushes (tags read at the lane that did not correlate to a vehicle or lacks AVC data); b) Images that were not correlated to a transaction (video auto flush); c) Lane unavailable (transactions captured during a period of time when the system (lane or host) is deemed "unavailable"); and d) Transactions captured when in lane mode: maintenance.				
322	The RTCS shall map transactions to be used as indicators for potential lane issues, defined as Unusual Occurrences, including but not limited to: a) AVI failed 6C UII Validation b) Class mismatch of Transponder versus lane AVC (only applicable to transaction with programmed Transponders [6C and TDM]); c) Transaction without images; d) Transaction with unusual number of axles (7+); e) Wrong Way Vehicle (WWV); f) Speed over 100 mph; and g) Speed of 0 mph (not including auto flush transactions).				
323	The RTCS shall support manual audit and amendments to lane transactions.				
324	Interfaces shall allow authorized users to quickly search by various query criteria, including: a) Lane transaction number; b) Specific time and time range; c) Location (facility); d) Lane/Toll Zone; e) Class mismatch; and f) any combination of these parameters.				
325	The RTCS shall automatically generate and track work orders for preventative maintenance, corrective maintenance, and emergency maintenance.				
326	The RTCS shall automatically alert maintenance staff once a work order has been generated.				
327	The RTCS shall support the assignment of maintenance priority levels based on the system configurable combination of severity level, facility, day and time.				
328	Data from the alerts, logs, Hardware and Software status, work orders, tickets and any items in the IT Service Management (ITSM) system shall not be deleted or modified for the duration of the Contract.				
329	The RTCS shall support the generation of ad-hoc work orders by authorized users.				
330	The RTCS shall track spares and inventory levels including serial numbers and associated warranty information for installed Equipment and inventoried Equipment.				
331	Error logs shall be transmitted to the ITSM system and available to authorized user in viewable form. Search and filter capability shall be provided to display and review up to one-hundred eighty (180) Calendar Days of data since the event.				
332	All work and diagnostics performed by Contractor staff on the RTCS shall be recorded and automatically reported to the ITSM system, including the technician identification, the time the maintenance was performed, and all status and recovery messages.				
333	Applicable industry standards and best practices for network and data communications shall be met.				
334	The Contractor shall supply all diagnostic Software and specialty tools required for support of maintenance activities, and NCTA will have full rights and access as further defined in the Contract to such diagnostic Software and specialty tools.				

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335	The Contractor's services shall be designed, developed, implemented and maintained in a manner consistent with security requirements, defined as the requirements levied on Information Environments that are derived from laws, Executive Orders, directives, policies, standards, instructions, regulations, procedures, or organizational mission/business case needs to ensure that security and privacy protections are implemented in the collection, use, sharing, storage, transmittal, and disposal of information. Security requirements shall be supported in a manner that makes verification possible via analysis, observation, test, inspection, measurement, or other defined and achievable means. The Contractor shall meet the following requirements (where applicable): •18 U.S. Code § 2721 — Driver's Privacy Protection Act •N.C.G.S § 143B-1375 — Security •N.C.G.S § 143B-1376. Statewide security standards •N.C.G.S. §143B-1331 — Business Continuity Planning •Functional Schedule for North Carolina State Agencies •North Carolina Statewide Information Security Manual •NCDOT Policies, Standards, Guidelines and Procedures •NCDIT-T Policies, Standards, Guidelines and Procedures •NCTA Policies, Standards, Guidelines and Procedures NC Statewide Information Security Manual can be currently viewed at: https://it.nc.gov/statewide-information-security-policies The policy regarding data classification and handling can be currently viewed at: https://it.nc.gov/documents/statewide-policies/statewide-data-classification-handling-policy/open The Functional Schedule for North Carolina State Agencies can be currently viewed at: https://archives.ncdcr.gov/government/state-government-agencies/functional-schedule/functional-schedule-search-guide The definitions in the Statewide Glossary of Information Technology Terms apply to all statewide information technology policies and standards and can be currently viewed at: https://it.nc.gov/documents/statewide-glossary-information-technology-terms The NIST Glossary of Information Technology Terms can be used to supplement the Statewide Glossary of Information Technology Terms and can be currently viewed at: https://csrc.nist.gov/glossary. Any exceptions to the standards described in this Requirement above and in Attachment 2: State of North Carolina, Statewide Information Security Manual shall be described in its Proposal by adding Appendix 3 in the Proposer's Technical Proposal Section 7. The Contractor shall describe any exception to the security policy and why they are exempt. The Contractors shall identify only of those exceptions within the policy with an explanation. Categorical exception to the policy shall be considered non-compliance.				
336	Remote access to all RTCS shall be VPN based and controlled through a central repository, with each user having a unique log-in.				
337	All remote access to the RTCS shall require two-factor authentication.				
338	User sign-on, access, and access failures, both local and remote, to any element of the RTCS shall be recorded and tracked for security audit proposes and reported to the ITSM system. The RTCS shall continuously and automatically monitor for unauthorized access; access violations shall be reported to the ITSM system as Priority 1 alert. These reports shall be provided to NCTA within one (1) hour of discovery.				
339	The RTCS shall support access levels, user roles, and privileges to be defined in a matrix during RTCS design with NCTA input and Approval. The RTCS shall allow for additional changes to the access levels, user roles, and the addition of personnel in a secure manner.				
340	A system-level account shall be provided for NCTA security systems to perform "credentialed" scans. Additionally, NCDOT IT security can request the Contractor to perform vulnerability, anti-malware and intrusion detection scans and provide reports through the term of the Contract.				
341	The Contractor shall not circumvent NCTA Approved RTCS security. All access to the RTCS and Approved changes made shall be recorded, monitored, and available for review and audit. Specific requirements for this shall be developed by the Contractor during RTCS design.				
342	The Contractor is responsible for all Updates, patches and hotfixes for all Software developed, furnished and/or installed under this Contract which are needed to maintain functionality and system security. Critical Updates shall be tested and installed within thirty (30) Calendar Days of release. All applicable Updates shall be reviewed to determine if they are necessary and, if so, shall be tested and installed within ninety (90) Calendar Days of release.				
343	The Contractor shall perform monthly vulnerability tests that are scheduled in the ITSM system, as well as every time a new Software release is deployed or new network Equipment, is added or replaced to evaluate the security risk to the RTCS and identify potential vulnerabilities. NCDOT IT security shall be a party to these security tests and shall be notified in advance of any scheduled tests.				
344	The Contractor is responsible for correcting all RTCS security deficiencies at the Contractor's cost and ensuring that all security risks are mitigated to a level that is acceptable to NCTA and meets state guidelines.				
345	The Contractor shall provide at their cost an annual information security risk assessment to be performed by a third-party Approved by NCTA and in consultation with NCDOT IT security. The Contractor shall provide the assessment results to NCTA. The Contractor, and third parties supporting the RTCS Information Environment, shall provide at their own cost applicable third-party risk assessment reports to NCTA that demonstrate the Contractor's compliance to industry accepted guidelines (e.g., SOC 2 Type II, ISO 27001, FedRAMP, PCI DSS, etc.) before the Contractor is permitted to handle Restricted and Highly Restricted NCTA data, and annually thereafter. The Contractor shall adhere to the Statewide Information Security Manual Risk Assessment Policy, Section RA-2: https://it.nc.gov/documents/statewide-policies/scio-risk-assessment https://it.nc.gov/documents/statewide-policies/statewide-data-classification-handling-policy/open				
346	The TRH shall provide access to: a) DVAS and ACSMS live and historical recordings; b) Live and historical transaction records, including but not limited to video and images captured; c) Audit application for transaction reconciliation and transaction accuracy verification; d) User Interface screens and Operations reports; e) ITSM; f) ACSMS; and g) All required local wide area (LAN), and wide area networks (WAN).				
347	All Hardware and Equipment required to operate the TRH shall be on UPS, as applicable. The UPS shall be supplied by the Contractor.				
348	The Contractor shall interface with the transfer switch and the Contractor-provided smart Power Distribution Units (PDUs) to manage the TRH power distribution. Maintenance technicians shall have remote access to manage power to critical devices.				
349	The UPS shall support the RTCS at each tolling location for a minimum of 2 hours on battery.				

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350	The UPS shall provide all critical status updates to the ITSM including on battery, low battery and critical low battery.				
351	When utility power is restored, and Hardware/Equipment is no longer on the UPS, a notification shall be reported to the ITSM system.				
352	ACSMS shall consist of a standardized solution designed to manage physical access to facilities while continuously monitoring security-related events. The system shall: 1. Detect all cabinet access events. 1. Record video of all toll equipment areas (24/7) and video of cabinet access from within the cabinet upon motion or activation of cabinet door. 2. Notify users upon user-definable activity via email, interface alert, or SMS.				
353	The Contractor shall integrate to a NCTA provided OBO with Toll Transaction data, DVAS, and all images.				
354	The Contractor shall transmit all data directly from the RTCS to the NCTA OBO. The Contractor shall describe its architecture in its Technical Proposal.				
355	The Contractor shall conform to the OBO ICD provided as **Attachment 6** to this RFP. This ICD is an initial draft, and it is expected that the Contractor will support the finalization of this ICD as part of the design, implementation and testing of this Project.				
356	The Contractor shall provide a summary report of all events captured at the roadside. This report at a minimum will include: •Date •Events transmitted to the OBO This report will look back ninety (90) days and will be delivered daily.				
357	The Contractor shall provide an Interface Test Plan (ITP) as described in Part III, Section 3.6.1.				
358	The Contractor shall provide data through its interfaces in open commercially available toolsets.				
359	The Contractor shall provide read only user access to all databases, data integration services for its provided RTCS required data dictionary for structured and unstructured data. For structured data that is typically in a RDMS or data lake, the Contractor shall include roadside lane transaction data, image processing, service management ticket data and other toll rate data. For unstructured data, NCTA will also have access to real time log files for its independent audit and review of such data using data integration services native to the selected cloud or virtual machine host platform.				
360	The Contractor shall provide read-only access to its pertinent databases above 30 days prior to the start of FAT and work with NCTA to establish access to its system via temporary access using a cloud or on-premises storage, with VPN or other access point.				
361	The cloud-based or virtual machine host infrastructure utilized to provide the collective system Host functionality shall be geographically and functionally redundant, and within the contiguous United States, such that service provision cannot be interrupted by the loss of a single cloud or virtual machine host site.				
362	The Disaster Recovery System shall provide all necessary functions to support the Disaster Recovery Plan requirements included in Part III, Section 3.9.				
363	The Disaster Recovery System shall support the RTCS to meet all functional and performance requirements in Part III, Section 5 RTCS Functional Requirements and Section 7 Performance Requirements – Maintenance and Operations.				
364	The Disaster Recovery System shall be accessible to NCTA and their supporting staff at all times.				
365	The Contractor is responsible to provide all network connectivity required between the Disaster Recovery System and all internal and external interfaces needed to support its operation.				
366	The Contractor shall be responsible for developing and submitting a comprehensive Disaster Recovery Architecture Plan, including Disaster Recovery Procedures, in accordance with current the versions of NIST CSF and the Statewide Security Manual for review and Approval by NCTA.				
367	If a cloud solution is provided, the cloud service provider shall configure the collective cloud-based environment in such a manner that disruption of service at a single location shall not interrupt cloud-based service provision in any way. If the Contractor implements the TRH as a virtual machine on physical servers, the Disaster Recovery system shall be in a replicated and fully available environment, outside a 50-mile radius from the primary TRH.				
368	The Recovery Time Objective (RTO) shall be five (5) hours.				
369	The Recovery Point Objective (RPO) shall be one (1) minute.				
370	The Contractor shall integrate all ITS devices provided by the Constructor into their ITSM to monitor for maintenance purposes.				
371	The ITSM shall support the scheduling of preventive maintenance activities for ITS devices.				
372	Transactions and system logs shall be retained online in the TRH for ninety (90) Calendar Days and then archived and purged.				
373	DVAS video shall be retained online for ninety (90) Calendar Days and purged.				
374	Images shall be retained online in the TRH for ninety (90) Calendar Days and purged.				
375	Zone Controller storage shall be sized to hold a minimum of ninety (90) days of one hundred percent (100%) of transactions, images and event data for each lane at the tolling location supported by the Zone Controller.				
376	The Contractor shall provide all maintenance activities associated with the RTCS maintenance and Software support services throughout the term of the Contract as further set forth in this SOW and Requirements.				
377	Hardware, Software, and RTCS Maintenance Services shall be provided from the time the system is installed through the end of Contract Term (including extensions) as further set forth in Part V, Terms and Conditions with full warranties as further set forth therein.				
378	The Contractor shall provide a Software license and associated escrow as further set forth in Part V, Terms and Conditions.				
379	In the Operations and Maintenance Phase, maintenance shall include all services required to maintain the RTCS, including Hardware, Equipment, Software, and components at the required performance levels. NCTA will not be charged any additional amounts beyond those included in the Approved price proposal for all services related to maintenance; notwithstanding the foregoing, force majeure events shall be as set forth in the Contract as further set forth in Part V, Terms and Conditions.				
380	All Equipment mounting Hardware and brackets provided as a part of this SOW and Requirements shall be included under Maintenance Services and, as such, shall be warrantied for the life of the Contract.				
381	If required by the Contractor, NCTA Approved repair or other services that fall outside the Maintenance Services described herein shall be invoiced at the service rates as defined in **Exhibit B-2**.				
382	The Contractor shall be responsible for the development, implementation, and administration of a warranty program for all Hardware, Contractor developed, and third-party Software as further set forth in Part V, Terms and Conditions.				
383	The Contractor shall maintain warranty records and service agreements for all Hardware and third-party Software and shall review and implement Software Upgrades and available patch reports to keep the RTCS current per the Approved Management Plan and as further set forth in Part V, Terms and Conditions.				
384	Detailed assignments of levels to incident types shall be in accordance with the requirements and shall be defined and Approved during the design of the project.				
385	The Contractor shall monitor ITSM system work orders and initiate corrective actions to meet requirements for the response to maintenance events and incidents that are under the Contractor's responsibility.				
386	NCTA uses Service Now IT Service Management System. The Contract shall integrate into the Service Now IT service management system for the creation, updates, and closure of all incidents, change orders, and configuration in the RTCS.				

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387	The Contractor shall allow NCTA to add agent-based monitoring to the Contractor provided RTCS to monitor its applications, infrastructure, database and network systems including all external interfaces for the RTCS.				
388	As part of the Software support services, Contractor shall develop and test Software as required to accommodate corrective actions, changes to business rules, or configurations. The scope shall include the provision of evidence packages detailing the planned changes for NCTA's review and Approval, including installation of new Software and confirmation of successful installation per the Approved Management Plan.				
389	All Maintenance incidents, activities and monitoring include, but are not limited to: a) monitoring the RTCS for failures and alarms and confirm an ITSM system work order has been created for each failure as defined in the system design; b) acknowledging and responding to work orders assigned to the Contractor; c) creation and assignment of a work order in ITSM system if a work order has not been created; d) performing the necessary maintenance and closing the ITSM system work order upon confirmation that the failure has been successfully corrected; e) monitoring and maintenance of the production and test environments; f) Updates to operating system and Software infrastructure in the production and test environments; g) performing preventive maintenance in accordance with an Approved Maintenance Plan; h) general Equipment and Hardware maintenance, replacement and spare parts inventory in ITSM system; i) general inspection and maintenance of roadside infrastructure; j) ongoing monitoring, Updates, maintenance tasks related to roadside subsystems, operations, controllers, servers and storage systems; k) address and resolve third-party Software issues (OS, third-party, peripheral and infrastructure Software); l) backup system monitoring (verification of successful backups), maintaining (applying Updates when needed) and managing (backup media rotation, offsite storage, etc.); m) monitoring, updating and general maintenance and troubleshooting of LAN communications and associated devices; n) monitoring, updating, and general maintenance and troubleshooting of both active and redundant LAN/WAN communications and associated devices; o) deployment of RTCS Software to the production and test environments; p) maintaining the ongoing relationship (support and maintenance agreements) with third-party vendors; and q) performing Software licensing renewals.				
390	Performance of all system administrative functions at regular intervals if not automated and recording and tracking such activities as preventive maintenance work orders through ITSM system.				
391	Continuous monitoring of system operations to verify RTCS is functional; security posture is adequate; processes are being executed as scheduled; files are transmitted as specified, and RTCS is operating to Contract Performance Requirements.				
392	Manual retrieval of data from the Zone Controllers in the event of extended communications failure.				
393	Re-establishing or re-installing system files, programs and parameters, as required, following a failure or damage to the RTCS and returning lanes to fully operational condition.				
394	Performing Disaster Recovery procedures as needed and return lanes and TRH to fully operational condition when disaster recovery situation is initiated.				
395	Analyzing anomalies and periodic, daily, and weekly trends to identify problems and initiating an investigation and subsequent correction.				
396	Maintenance shall include but not be limited to the following: a) Work orders and alerts assigned to the Contractor, as defined during the design; b) development of defect fixes, security fixes, performance fixes and corrections to the Software and applications as identified during audits; c) Updates to all Software drivers to meet any new standard operating system Upgrades as they become available; d) Software changes that are necessary or required to meet the system requirements, parameter changes, or lane configuration changes; e) source code maintenance; f) perform internal testing prior to releasing fixes to production; g) ongoing Software warranty maintenance as set-forth in the Contract; and h) change management and configuration management tasks prior to Software and Hardware changes.				
397	The Contractor shall provide in electronic format all patches and Updates made to the RTCS Software.				
398	Upgrades and enhancements shall be proposed by the Contractor or requested of the Contractor in accordance with the change order/extra work order process as set forth in Part V, Terms and Conditions. *Examples of Upgrades and enhancements include but are not limited to: accommodating major changes to standards, statutes, or interoperability Equipment or the addition of new Equipment or functionality providing demonstrable benefits in performance, costs or productivity.				
399	Software modifications required to maintain and support the RTCS as a part of the normal course of business shall not be considered Upgrades or enhancements paid for by NCTA. These modifications include but are not limited to: patches and security Updates, version changes; configuration or parameter changes; minor changes to Software or code, such as changes to the existing ICDs; Software modifications required to ensure RTCS is compliant to existing standards and changes for the Contractor's benefit that improve the Contractor's ability and efficiency to maintain and support the RTCS.				
400	The Contractor shall maintain compatibility with all applicable AVI standards, including but not limited to the IAG Inter-CSC file versions, 6C TOC versions, and PROTOCOL SPECIFICATION SeGo versions. These upgrades are solely the responsibility of the contractor and shall be implemented with 90 days of the standards being released.				
401	The Contractor shall, upon request, support NCTA in any audit activity relating to NCTA's RTCS or operations. In addition, the Contractor shall conduct audits in accordance with the Contractor's QA and QC program. All deficiencies identified through the audit process shall be successfully corrected by the Contractor. These audits may include, but are not limited to, the following: a) Internal control procedures; b) Revenue/transaction reporting; c) Financial audit; and d) System processing and performance.				
402	Monitoring and troubleshooting of the RSS including, but not limited to: a) Zone Controllers; b) AVI system; c) AVDC system; d) ICPS components and controllers; e) OCR/ALPR Software; f) Image-based transaction alarms;				

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	g) DVAS cameras and system;				
	h) ACSMS cameras and system;				
	i) inspection, test, and repair of cables, wiring and terminations;				
	j) Contractor supplied network Equipment; and				
	k) all Roadside Contractor and third-party Software.				
403	The Contractor shall perform automated routine diagnostics on all in-lane peripherals and in-lane subsystems.				
404	The Contractor shall monitor and maintain RTCS Software processes, operations, and interfaces to the host, TRH and to NCTA CBOS/OBO.				
405	The Contractor shall monitor real-time roadway operations screens and dashboards and responding to issues.				
406	The Contractor shall analyze periodic, daily, and weekly trends to identify problems, including but not limited to: a) a high number of transactions without Transponder; b) a high number of class mismatch transactions; c) abnormal changes in traffic counts and class; d) a high number of exceptions or unusual occurrences as described in this SOW; e) transaction exceptions; f) a high number of rejected images. (based on feedback from OBO)				
407	All RTCS administrative functions, if not automated, shall be performed by the Contractor at regular intervals as part of the RTCS preventive Maintenance Services according to the Approved Maintenance Plan to ensure system performance is optimized. All such system administrative functions shall be scheduled as preventive maintenance work orders through ITSM system and tracked.				
408	Continuous monitoring of system operations shall be performed by the Contractor in conjunction with NCTA to verify that the system is functional, security posture is adequate, processes are being executed as scheduled, files are transmitted as specified, and system is operating to Contract Performance Requirements.				
409	Continuous monitoring of operations, including but not be limited to: a) confirming and verifying receipt of all the ITSM system messages and alerts; b) verifying the ITSM system is receiving and processing system events and reporting the correct status; c) evaluating sample transactions data for exception; d) confirming data and image transmission to the host; e) verifying processes, programs and scheduled jobs are successful; f) reviewing comparative reports to identify system degradation; g) reviewing OCR/ALPR or manual image processing results and poor-quality images; h) monitoring the DVAS video and event data; i) reviewing sample images from each tolling location; j) correcting performance issues identified; k) evaluating storage requirements; l) verify time synchronization is occurring as configured and system clocks are not drifting beyond acceptable threshold; and m) reviewing error logs and alerts.				
410	Provide continuous 24x7 system administration services coverage on the RTCS to ensure that it is performing and shall continue to perform at a satisfactory level.				
411	System administration services shall include monitoring and corrective action to ensure system performance is in accordance with Requirements of this SOW. This shall include but is not limited to: a) monitoring host Hardware at the TRH servers, storage devices and backup systems; b) verifying processes, programs, and scheduled jobs are successful; c) all transactions and images are successfully transmitted to the receiving systems; d) all messages described in the ICD are being successfully exchanged between the RTCS, and NCTA OBO; e) confirm applications are functional and available to authorized users; f) all scheduled reports are successfully generated and available to authorized users; g) all processes are functioning, and data and images are moving successfully through the queues; h) all third-party interfaces are functioning and successfully exchanging files; i) scheduling of preventive, corrective and predictive maintenance activities; j) any daily, weekly, or periodic maintenance required to maintain the RTCS at required performance levels (for example: indexing and tuning databases; archiving and purging in accordance with NCTA's retention policy); k) maintaining and updating records of all maintenance events and activities in the ITSM system; l) third-party Software or firmware Upgrades in conjunction with NCTA, as required and to be compliant to security requirements including but not limited to performing security Software Upgrades, database Upgrades, and operating system Upgrades; m) contact with NCTA, operations and contractors regarding system issues, performance, security posture, Software release, and maintenance scheduling; n) Approved manual actions, adjustments and Updates to the system data based on predefined criteria to correct issues and as authorized by NCTA; o) re-establishment or re-installation of system files, programs, and parameters, as required, following a failure or damage to the system; p) monitoring of error logs and system logs; q) maintenance of up-to-date Software backups (all system Software and data); r) installation of new Software and confirmation of successful installation; s) assisting NCTA operations staff as requested by NCTA; t) troubleshooting RTCS issues; u) creation of ad-hoc data queries requested by NCTA; v) Monitoring ITS devices (if included in scope); w) generation of queries as requested by NCTA; and x) analysis of data as requested by NCTA.				
	Software support services shall include monitoring and corrective action to ensure system performance is in accordance with Requirements of this SOW, to include database management and operation. This shall include but is not limited to investigation and analysis of errors and exceptions and taking corrective action, including correcting the problem and reprocessing the data, monitoring of notifications, and initiating corrective actions on application programs to meet the requirements listed below:				

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		Required Inputs			
412	a) Updates to the RTCS and application to support Upgrades to Hardware or third-party Software;				
	b) Updates to the RTCS and application to support all changes to business rules and RTCS configurable parameters, and deploy changes in production;				
	c) attend interoperability meetings as requested by NCTA;				
	d) Updates to the RTCS and application to support minor changes to NCTA interoperable partner and national interoperability ICD;				
	e) Updates to the RTCS and application to support the addition of new interoperable agencies;				
	f) Updates to the RTCS and application to support changes to continue its compliance to Updated security requirements; and				
	g) Updates to the RTCS and application to support legislative and statutory changes.				
	h) As part of the Software support services, the Contractor shall develop, and test Software as required in accordance with NCTA change order process to accommodate corrective action and changes to Business Rules. The Contractor shall include the provision of evidence packages detailing changes for NCTA's review and Approval, installation of new Software and confirmation of successful installation.				
	i) As part of the network administration, the Contractor shall monitor all network alerts and alarms, as well as to detect intrusion attempts and prevent intrusions.				
413	The Contractor shall Upgrade and Update the network security and provide the required Software and monitoring tools to ensure the RTCS is always in compliance with the most recent penetration and vulnerability test requirements.				
414	The Contractor shall be capable of providing and performing onsite preventive maintenance on the Roadside System Hardware, host Hardware, Contractor LAN/WAN communications Equipment, and Software in accordance with the Approved Maintenance Plan.				
415	The Contractor shall inspect all ITS devices, both major components and support components (fans, cables, connectors, cabinets, Equipment racks) that constitute the ITS and shall make such repairs, cleaning, adjustments, and replacements of components as necessary to maintain the Equipment in normal operating condition in accordance with the Approved Maintenance Plan. *Optional scope item to be determined by NCTA*				
416	The Contractor shall inspect all Contractor installed Equipment, both major components and support components (fans, cables, connectors, cabinets, Equipment racks, storage units) that constitute the RTCS and shall make such repairs, cleaning, adjustments, and replacements of components as necessary to maintain the Equipment in normal operating condition in accordance with the Approved Maintenance Plan.				
417	The Contractor shall include in the Maintenance Plan their preventative maintenance program, which includes a schedule of all preventative maintenance activities requiring lane closures for the upcoming month at least five (5) Business Days before the beginning of the month.				
418	Preventive maintenance shall be performed by the Contractor during the normal working hours when maintenance technicians are scheduled to be onsite. NCTA Approved diagnostic aids, tools, and Equipment to perform preventive maintenance Equipment analysis shall be provided by the Contractor, as necessary.				
419	Preventive maintenance requiring lane closure shall be scheduled by the Contractor for off-peak travel periods, evenings, Saturdays, and Sundays and coordinated with NCTA, so that the work shall not interfere with normal traffic flow unless otherwise Approved by NCTA.				
420	The Contractor shall provide changes to the Approved Maintenance Plan schedule as soon as changes become known due to weather, contractor availability, or any other reason.				
421	In addition to required ongoing Contractor monitoring, the servers, data processing units and/or cloud hosted or virtual machine host environments shall be periodically checked by the Contractor to verify that storage space is not reaching limits, disks are not fragmented or damaged, Software being used is of latest version per the configuration management and data is being processed and transferred in an appropriate manner.				
422	Transaction and image processing volumes and times shall be monitored by the Contractor and Systems optimized for performance with NCTA Approval to meet all Contractual Requirements.				
423	Report generation times, system access times, and system response time shall be monitored by the Contractor to ensure performance meets the Contractual Requirements.				
424	The Contractor shall include all Equipment and systems as part of the preventive maintenance in accordance with the original Equipment manufacturer's guidelines. Any variations or exceptions shall be noted by the Contractor and Approved in advance by NCTA.				
425	The Contractor shall provide a preventive maintenance schedule, to be Approved by NCTA, as detailed in the Maintenance Plan.				
426	The preventive maintenance schedule shall be entered by the Contractor into the ITSM system, and work orders shall be automatically created to alert Contractor staff of required preventive maintenance.				
427	All work performed by the Contractor to correct Software defects or problems to meet the requirements of the Contract shall be considered as corrective maintenance. Such problems include but are not limited to:				
	a) failure of subsystem functions and devices;				
	b) problems identified by the users, including the TMC, and customers;				
	c) interface issues and devices;				
	d) failure of processes and programs;				
	e) data reconciliation issues;				
	f) report issues;				
	g) application failures;				
	h) RTCS network issues;				
	i) inadequate security posture;				
	j) ITS device issues (if included in scope);				
	k) degraded RTCS or component performance; and				
	l) non-conforming availability or MTBF.				
428	Contractor shall notify NCTA before any corrective maintenance is performed.				
429	Notwithstanding the foregoing, for the repeated failure of Equipment, components, or systems, the Contractor shall undertake an investigation. If the problem is determined by NCTA to be a pervasive defect, the Contractor shall be responsible for resolution as set forth in Part V, Terms and Conditions.				
430	The Contractor shall immediately notify NCTA of any incident or event whereby the potential or actual loss of revenue occurred. The Contractor shall take immediate action to rectify the condition and return the RTCS to normal functioning.				
431	A monthly incident report shall be provided by the Contractor that includes a breakdown of lost transaction data and revenue by roadway for each incident. If the condition is determined to be due to the fault of the Contractor, damages shall be assessed in accordance with the Part V, Terms of the Contract.				
432	Contractor shall be responsible for the inventory of all spare parts at the storage facility and shall be insured in this regard as set forth in the Contract. The Contractor shall account for all spare parts and shall provide safeguards against theft, damage, or loss of the spare parts.				
433	The spares facility and storage area shall be secured and connected to an up-to-date security network System with alarm notification monitored by the Contractor. Further, it is required that NCTA shall have full and unrestricted access to the Maintenance and or storage facility.				

No.	Requirements	Status B-Base Product M-Base Modified D-New Development E-Exception	Source P-Proposer S-Sub T-Third Party NA-Not Applicable	If Applicable Subcontractor Name and/or 3rd Party Product/Vendor	Comments Comment required if "Exception", optional otherwise.
434	The Contractor shall be responsible for procuring, maintaining and storing spares for the ITS Equipment maintained under this Contract. *Optional scope item to be determined by NCTA*				
435	Thirty (30) Calendar Days prior to placing the RTCS in revenue collection, the Contractor shall have purchased and have on hand, an adequate inventory of spare parts to maintain the system in accordance with all system availability KPIs.				
436	The spare parts shall be purchased on behalf of NCTA and shall be owned by NCTA.				
437	Any spare parts that are lost or damaged due to the negligence, intentional act, or omission of the Contractor or its employees, Subcontractors, agents, or invitees shall be replaced by the Contractor at its sole cost.				
438	Contractor shall be responsible for the inventory of all spare parts at the storage facility and shall be insured in this regard as set forth in the Contract. The Contractor shall account for all spare parts and shall provide safeguards against theft, damage, or loss of the spare parts.				
439	The spares facility and storage area shall be secured and connected to an up-to-date security network System with alarm notification monitored by the Contractor. Further, it is required that NCTA shall have full and unrestricted access to the Maintenance and or storage facility.				
440	The Contractor shall ensure that only spare parts and Equipment required to service the Roadway System and WAN/MAN/LAN communications spare Equipment are stored at this facility and shall only be used for NCTA Roadway Systems.				
441	The Contractor shall be responsible for the Maintenance of an adequate spare parts inventory during the Contract Period. The Contractor is responsible for monitoring and identifying the existing spare parts inventory, ordering spare parts as required, and proposing the quantity needed to maintain the required performance and maintaining all applicable data in the ITSM.				
442	The Contractor shall also be responsible for tracking of all warranty replacement for Contractor provided Equipment through returned material authorization process. If the replaced part is under warranty, the part shall be immediately replaced with a new part. If the replaced part is out of warranty, Contractor shall make every effort to repair the replaced item to a usable status and place the part back into spares inventory.				
443	If the Contractor is unable to repair the part, a new part shall be purchased and placed into spares inventory. The details of the repair efforts, including problem, status, inventory, and repair disposition, shall be included in the ITSM inventory and repair database.				
444	The entry of a problem (either by the RTCS or an authorized user) into the ITSM system or the presence of a failure notification shall constitute the start of the acknowledgment time for purposes of measuring the Contractor's acknowledgment time and response/repair time.				
445	For purposes of measurement of performance and for the development of maintenance policy and procedures, notification of RTCS malfunctions, problems and discrepancies may be provided to the Contractor in four (4) different methods, summarized below. a) Verbal Notification: Defined as an in-person notification or telephone call to the Contractor's designated maintenance personnel. In all cases, the first conversation with, or notification of the Contractor shall signify the start of the response time for purposes of measuring the Contractor's response time. All verbal notifications shall be recorded in ITSM system by the Contractor. b) Written Notification: Defined as a written description of a problem or condition, typically provided by NCTA or its representatives by email. The time of receipt email shall signify the start of the response time for purposes of measuring the Contractor's response time. All written notifications shall be recorded in ITSM system by the Contractor. c) ITSM System Notification: Defined as an automatic notification through the ITSM system identifying a problem within the RTCS that is the maintenance responsibility of the Contractor and sending out an automatic work order message by email or text to a Contractor's maintenance staff to respond to the failure. In addition to the Contractor notification, the work order shall be posted on the ITSM system and available via reports. The presence of an ITSM system notification in the RTCS shall constitute the start of the acknowledgement time for purposes of measuring the Contractor's acknowledgement and response time. d) Generation of Alert: Defined as automatic creation of an alert identifying a problem within the RTCS that is the maintenance responsibility of the Contractor. The generation of the automatic alert in the RTCS shall constitute the start of the acknowledgement time for purposes of measuring the Contractor's acknowledgement time.				
446	The Contractor shall provide NCTA TMC with any requests for lane closures to address emergency corrective repairs. The request shall be submitted immediately after the system failure is detected.				
447	NCTA will have access to all maintenance and Software service records at any time for review and audit, upon reasonable notice. The Contractor shall provide monthly reports generated in the RTCS that permits NCTA to evaluate Contractor's maintenance performance. The Contractor shall provide a template at least 180 Calendar Days prior to Go-Live for NCTA review and Approval.				
448	The Contractor's maintenance manager shall maintain current, complete, and accurate records for all maintenance and Software support services activities. The Contractor's maintenance manager shall institute procedures that make sure the maintenance staff enters complete information into the ITSM before closing a work order or trouble ticket.				
449	All preventive, pervasive, and predictive maintenance activities shall be reported in the same manner as corrective or emergency maintenance by the Contractor. The information shall be contained on the ITSM and shall be made available through various ITSM system reports.				
450	The Contractor and NCTA will utilize the ITSM for initiating the work orders. ITSM shall be utilized for recording and tracking all maintenance and Software support services performed on the RTCS. Additionally, all Equipment provided under this Contract shall be tracked through ITSM from the purchase to their disposal.				
451	In all cases, the Contractor is responsible for logging all reported maintenance activities into the ITSM. The Contractor shall also be responsible for documenting all information and issues related to a failure condition, including all actions taken to complete the correction into the ITSM.				
452	The work order shall contain as much information as possible in order for persons other than the technician or his supervisor to reasonably determine the fault, when it was worked on, the corrective action, and any other information pertaining to the individual maintenance event, including replacement of parts.				
453	All Maintenance performance metrics shall be recorded and tracked through the ITSM, and compliance to Performance Requirements shall be validated using ITSM reports.				
454	It is the Contractor's responsibility to ensure that its maintenance staff has real-time access to the ITSM and that all the required connections are established and ongoing to ensure that the maintenance staff has secure remote access Approved by NCTA. Maintenance staff shall be trained in the use of the ITSM.				
455	The Contractor shall be responsible for maintaining an adequate level of technical staff to perform Maintenance and Software support services on the RTCS. The Contractor shall ensure that sufficient staffing is available to cover all maintenance activities identified in this SOW and Requirements at all times but particularly during the following periods: a) Weekends; b) Holidays; c) Personnel on vacation/sick time; d) After regularly scheduled work hours (on-call); and e) Unexpected emergency or crisis.				

No.	Requirements	Status	Source	If Applicable	Comments
		Required Inputs			
		Status	Source	If Applicable	Comments
		B-Base Product M-Base Modified D-New Development E-Exception	P-Proposer S-Sub T-Third Party NA-Not Applicable	Subcontractor Name and/or 3rd Party Product/Vendor	Comment required if "Exception", optional otherwise.
456	All Contractor personnel shall be subject to appropriate security and background checks to the satisfaction of NCTA. The Contractor shall obtain written Approval from NCTA for all service personnel, and each Contractor personnel shall be required to sign an acceptable use agreement.				
457	The Services and Work performed under the Contract are considered highly confidential, and the Contractor personnel shall at all times comply with NCTA security and privacy requirements.				
458	NCTA will identify and designate a primary point of contact for the Contractor. Under most circumstances, The Contractor shall limit communication with NCTA authorized staff and to NCTA's designated point of contact unless otherwise directed by NCTA.				
459	Discussion by the Contractor of any services or work performed under the Contract with the media, in oral presentations, in written publications, or in any other form, not related to this Contract shall be Approved in advance by NCTA.				
460	The Operations Center shall monitor the RTCS for failures and alarms and confirm an ITSM system work order has been created for each failure as defined regardless of the Maintenance level.				
461	The Contractor shall maintain the RTCS LAN/WAN that includes all Contractor network connections in the toll Equipment cabinets and interconnections between the toll Equipment cabinets.				
462	The Contractor shall conform to all applicable MOT requirements detailed in Part III, Section 3.10.7 General MOT Requirements and Conditions and those within the Performance Requirements throughout the entire Maintenance and Operations phase. Location specific requirements will be provided within future Task Orders.				
463	The Contractor will conduct a review of system's performance on a monthly basis, utilizing a combination of reports generated by the RTCS, including ITSM systems, and other Approved reports, as determined by NCTA to be necessary. The Contractor shall provide systems, processes and procedures to meet all Performance Requirements.				
464	NCTA may conduct operational audits of the RTCS. NCTA will provide the results to the Contractor to identify issues with the performance of the system. In the event there is a discrepancy between the compliance audit performed by the Contractor and the operational audit, NCTA and the Contractor will meet to investigate and resolve the reporting difference.				
465	All performance metrics shall be measured according to the KPI Guidebook document, provided in **Attachment 9** to this RFP.				
466	The Contractor shall immediately notify NCTA of any failure observed by the Contractor whereby actual loss of revenue occurred, or the potential for losses exist.				
467	If the resolution of any failure is under the Contractor's control and/or responsibility, the Contractor shall take action to correct the failure condition and return the RTCS to normal functioning in accordance with the Contract. If the failure condition is determined to be due to the Contractor's fault and it results in failure to meet the Performance Requirements, NCTA will assess non-compliance points for each failure as described in this performance section and may be subject to other remedies in accordance with the Contract.				
468	Each AET Lane within a Toll Zone with all of its subsystems is properly functioning and available to collect revenue and send required transactions and images to the host 99.9% of the time excluding scheduled and Approved maintenance. Availability shall be calculated based on the following calculation: Availability = 1- (chargeable downtime min / (minutes in period-exception min in period))				
469	RTCS reports detailing the Lane availability along with ITSM and help desk tickets, work orders, and feedback from customers, BOS staff, NCTA staff, and consultants shall be utilized to identify availability failures.				
470	For any month in which **all** functions of the Toll Zones are not fully available and operational at least 99.9% of the time excluding scheduled and Approved maintenance, The Contractor shall be assessed 2.0 points for each 0.1% or portion thereof below the Performance Requirement.				
471	The Contractor shall create a single transaction for each vehicle which passes through a toll zone and send the transaction to the OBO. A single vehicle may include a vehicle and any additional attachment, such as a trailer. Errors in this metric shall be detected through the following: Detailed audits of toll zone video records (DVR) correlating transactions to vehicles, a video analytics system independent of the RTCS detection system, or another mutually agreed upon validation method.				
472	For any month in which the vehicle detection transaction accuracy falls below 99.9%, the Contractor shall be assessed 1.0 point for each 0.1% or portion thereof below the Performance Requirement.				
473	The Contractor shall correctly build transactions by capturing and correlating images as specified in the functional requirements and providing the images to the OBO as specified in the ICD(s). Errors may be detected through the following: a) Detailed audits of transactions b) Response Codes and acknowledgements received from and sent to the OBO				
474	For any month in which the image transaction capture and transmission accuracy falls below 99.9%, the Contractor shall be assessed 1.0 point for each 0.1% or portion thereof below the Performance Requirement.				
475	The Contractor shall correctly classify all vehicles according to the functional requirements in the Contract. The performance will be measured with automated audits using data analytics accompanied with detailed review.				
476	For any month in which the classification accuracy falls below 99.5%, the Contractor shall be assessed 1.0 point for each 0.1% or portion thereof below the Performance Requirement.				
477	The RTCS shall provide images of sufficient image quality to achieve the Contractor's desired automation rate and NCTA's Requirements such that less than 0.1% of the images are rejected for reasons under the Contractor's control. Reject reasons not under the Contractor's control are: a) the vehicle has no plate; b) the plate is not in the normal camera field of view because it is not mounted in accordance with State laws; c) the plate is covered by dirt, a trailer hitch, tailgate, or some other material such that the numbers/letters are not human-readable; or d) the plate is damaged so that numbers/letters are not human readable.				
478	The number of images rejected for reasons within the Contractor's control shall be compared to the number of images transactions produced at the lane that month to calculate whether or not the Contractor's image quality met the standard.				
479	This metric will be reported by NCTA using data reported from the Image Verification Services, provided by others.				
480	For any month in which the requirement is not met, the Contractor shall be assessed 1.0 point for each 0.1% or portion thereof below the Performance Requirement.				
481	The Contractor shall correctly read and assign properly mounted transponders to the correct vehicle and report the correct declared transponder status. The performance will be measured by NCTA with automated audits using data analytics accompanied with detailed review.				
482	For any month in which the AVI accuracy falls below 99.5%, the Contractor shall be assessed 1.0 point for each 0.1% or portion thereof below the Performance Requirement.				

No.	Requirements	Required Inputs			
		Status	Source	If Applicable	Comments
		B-Base Product M-Base Modified D-New Development E-Exception	P-Proposer S-Sub T-Third Party NA-Not Applicable	Subcontractor Name and/or 3rd Party Product/Vendor	Comment required if "Exception", optional otherwise.
483	The Contractor shall process and transmit all transactions and associated images to NCTA's OBO within four (4) hours after the vehicle travels through the tolling point.				
	a) System reporting detailing the transaction date/time and the date/time that the transaction was acknowledged by the OBO shall be compared to a matching TRH Report. The report shall show both the volume and percentage of both compliant and non-compliant transactions for each day as well as totals for the month.				
	b) The RTCS and OBO validate the transactions to ensure that they comply with the agreed-upon ICD, and transactions that do not meet the ICD shall be rejected as incomplete or inaccurate. Unless a rejected transaction is corrected and resubmitted within four (4) hours, they shall not meet this KPI.				
484	For any month in which 100% of the image transactions are not transmitted in accordance with the Approved ICD to the OBO within 4 hours, the Contractor shall be assessed 1.0 point for each 0.1% or portion thereof below the Performance Requirement.				
485	The Contractor shall notify NCTA and NCDOT of all MOT activities during the maintenance period.				
486	The Contractor shall provide a schedule of all preventative and predictive maintenance MOT activities for the month by the 5th calendar day of the month.				
487	The Contractor shall provide a minimum of twelve (12) hours of notice prior to any changes to the monthly maintenance schedule.				
488	The Contractor shall conform to the latest version of the NCDOT Standard Specifications for Roads and Structures for regulations for MOT activities during the maintenance period.				
489	The Contractor shall perform in-lane testing of the WWVD and Notification system as part of all preventive maintenance events involving lane closures by driving a test vehicle through the toll zone opposite the direction of traffic, within the closure, and measure the detection and notification functionality according to the functional requirements.				
	a) The Contractor will be assessed 1.0 point for each Preventive Maintenance event involving a lane closure where WWVD and Notification Testing was not completed.				
	b) The Contractor will be assessed 1.0 point for each WWVD and Notification Test that does not meet the functional requirements outlined in this Contract.				
490	The Contractor shall support any event the provider of an external WWVD system conducts controlled testing and shall meet the applicable functional requirements outlined in this Contract. The Contractor will be assessed 1.0 point for each testing event not properly supported by the Contractor or when the test results do not meet the functional requirements outlined in this Contract. a) The Contractor will be assessed 1.0 point for each testing event not properly supported by the Contractor				
	b) The Contractor will be assessed 1.0 point for each external WWVD test that the RTCS does not meet the functional requirements for notification outlined in this Contract.				
491	The Contractor shall complete all scheduled Preventative Maintenance for the RSS, ITS, and Facilities as detailed in **Attachment 10: Preventative Maintenance Checklist**.				
	a) The Contractor shall submit a monthly maintenance report with all Preventative Maintenance activities detailed.				
492	The Contractor will be assessed 1.0 point for each scheduled Preventive Maintenance that is not completed according to the schedule.				
493	The Contractor will be assessed 1.0 point for each scheduled Preventive Maintenance that is not completed according to the schedule				
494	The CCTV and DMSs, with all of its subsystems, is properly functioning 95% of the time, collectively, excluding scheduled and Approved maintenance. Availability shall be calculated based on the following calculation: Availability = 1- (chargeable downtime min / (minutes in period-exception min in period))				
495	ITSM reports detailing the device availability along with ITSM and help desk tickets, work orders, and feedback from customers, BOS staff, NCTA staff, and consultants shall be utilized to identify availability failures.				
496	The MVDs, with all of its subsystems, is properly functioning 95% of the time, collectively, excluding scheduled and Approved maintenance. Availability shall be calculated based on the following calculation: Availability = 1- (chargeable downtime min / (minutes in period-exception min in period))				
497	ITSM reports detailing the device availability along with ITSM and help desk tickets, work orders, and feedback from customers, BOS staff, NCTA staff, and consultants shall be utilized to identify availability failures.				
498	The Contractor shall respond and fulfill NCTA's requests for research, analysis, and/or explanation and provide feedback/report within one (1) week or one (1) month as agreed to by NCTA.				
499	Any failure to meet a Performance Requirement that requires the completion of a specific action(s), which is not completed in accordance with the requirement, does not relieve the Contractor of the responsibility to perform in accordance with the RTCS requirements. The required specific action(s) shall be completed within 48 hours. For example, if the Contractor fails to transmit all transaction files to the agency within four (4) hours, the files shall still be sent to the agency.				
500	The Contractor shall develop a corrective action plan for each failure to meet a Performance Requirement identifying the root cause(s) and providing a plan to rectify the current situation, if applicable, and prevent future occurrences.				
501	The corrective action provided by the Contractor shall be in a format Approved by NCTA.				
502	The Contractor shall submit a corrective action plan for each failure to meet a Performance Standard for NCTA's review and Approval. Until NCTA Approves the corrective action plan, the failure cannot be considered resolved.				
503	The corrective action plan shall identify the subsystem(s), component(s), processes, and activities associated with the failure to meet a Performance Requirement in sufficient detail to allow NCTA to understand the issue and why the proposed solution shall prevent future occurrences. The RTCS elements include but are not limited to the elements below: a) vehicle throughput rate; b) Transponder capture rate; c) Transponder reporting accuracy; d) vehicle detection accuracy; e) Transponder association accuracy; f) vehicle classification accuracy; g) image capture reporting accuracy; h) license plate extraction (OCR/ALPR) accuracy, if provided; i) image quality; j) assignment of the correct toll to the transaction; k) transaction processing requirements; l) false read processing; m) image transaction transmission requirements;				

No.	Requirements	Status B-Base Product M-Base Modified D-New Development E-Exception	Source P-Proposer S-Sub T-Third Party NA-Not Applicable	If Applicable Subcontractor Name and/or 3rd Party Product/Vendor	Comments Comment required if "Exception", optional otherwise.
	n) AVI transaction transmission requirement;				
	o) Toll Zone and Toll Facility speed accuracy; and				
	p) ITSM system.				
504	Non-chargeable failures shall include:				
	a) Force majeure, as defined in Part V of this Contract;				
	b) vandalism;				
	c) RTCS component failures caused by externally applied stress conditions outside of the requirements of this SOW and Requirements;				
	d) RTCS component failures caused by environmental or operating conditions outside of the Requirements of this SOW and Requirements;				
	e) normal operating adjustments as allowed in the MTP or Maintenance Plan, as applicable;				
	f) failures where NCTA have Approved to waive a chargeable failure in advance; and				
	g) failures that are customer or NCTA user induced or are caused by a third-party service provider not under the contractor's control as determined by NCTA.				
505	The Contractor shall describe in detail how the performance against a requirement shall be tracked, tested, and reported, identifying specific reports and data elements all in alignment with the KPI Guidebook provided as **Attachment 9** to this RFP. In the case of a KPI which cannot be tracked by the RTCS, the form of manual tracking or testing shall be described and included in the Maintenance Plan.				
506	The Contractor shall prepare and submit to NCTA the performance report package on an agreed-upon Day each month as defined in these requirements.				
507	The performance report package shall include a performance scorecard calculating the non-compliance points assessed that month, if applicable, a series of reports, one (1) per Performance Requirement detailing the Contractor's performance against the requirement that month supporting the scorecard for each KPI and a historical report detailing the Contractor's performance against each requirement for the most recent twelve (12) months. See Section 7 Performance Measurement for details on these reports. Copies of all corrective action plans related to failures for that month shall be Approved and included.				
508	The performance report package shall provide all detailed data and calculations in a transparent and auditable format.				
509	The Contractor shall provide the required performance report package to NCTA before an invoice is considered for payment.				
510	Performance reporting by the Contractor and any associated adjustments related to Performance Requirements shall begin for the period beginning on the first Day of the Operations and Maintenance Phase and shall continue for the duration of the Contract.				

Exhibit C-9
Proposer Company Reference Form

(A Word version is "paper clipped" to this Exhibits file for ease of completion.)

Proposer Minimum Experience for AET/ORT

Proposer shall use this form to clearly demonstrate how it meets the minimum qualification requirements for Proposals with regard to AET or ORT Proposer project experience. Each reference provided may be contacted by NCTA. Copy this form as needed to comply with the requirements outlined in the RFP for each of the Implementation and Operations and Maintenance Phase minimum requirements. NCTA may or may not contact references to obtain more information about the Proposer experience at NCTA sole discretion.

Proposer's Name: _____

Please check off which qualifications requirement this reference is intended to address (you may check more than one box to cover both Implementation and Maintenance requirements as long as the explanation below is sufficiently detailed to cover both).

Implementation		Operations and Maintenance

Reference Company/Agency Name:		
Address:		
City:	State:	Zip Code:
Phone Number:	Fax Number:	
Project Manager Reference:		
E-mail:		

Alternate Reference*:	
Phone Number:	Fax Number:
E-mail:	
Alternate Reference Role on Reference Project:	
***Must be completed in addition to the Project Manager reference**	

Proposer's role on project and years of participation (mm/dd/yy to mm/dd/yy):

Project location, scope, cost, start / end dates:

Operational functionality, facility types (AET, ORT) number of lanes / plazas, revenue collected, etc.:

Relevant equipment and systems used:

Comparison to NCTA requirements:

Installed System and Operations and Maintenance documented performance, as applicable:

Key Personnel involved and role who are also proposed on NCTA project:

Exhibit C-10

Surety Commitment Letter

(A Word version of the Surety Commitment Letter is "paper clipped" to this Exhibits file for ease of completion.)

<u>CONSENT OF SURETY</u>

TO: North Carolina Turnpike Authority

We have reviewed the proposal of _____

(Proposer)

_____

(Address)

for the Complete 540 Phase 2 Roadside Support System for which Proposals will be received on:

_____

(Proposal Due Date)

and wish to advise that should this Proposal of the Proposer be accepted, and the Contract awarded to,

such Proposer, this company agrees to become the surety and provide the Payment and Performance

Bonds required by the Contract for both the Implementation Phase and Operations and Maintenance

Phase. Such bonds will be in the amounts identified in the Price Proposal as referenced in the RFP Part I,

Section 5.1 Notice of Award with terms of the bonds as also provided in that Section.

We are duly authorized to do business in the State of North Carolina.

Surety Company/Address:

_____

_____

_____

_____

(Authorized Signature)

ATTEST:

_____

[Attach Power of Attorney]

(Affix Corporate Seal below this line. If no seal, write "No Seal" below this line and sign.)
****

Exhibit D
Payment Schedule

Exhibit D: Payment Schedule

A. Payments for Implementation Roadside Toll Collection System Design and Development (Notice to Proceed)

Payment Number	Payment Milestone	Pay Items (Paid as a percent of implementation costs, excluding costs of installation and materials)	% Paid	Cum. % Paid
A-1	Notice to Proceed	Implementation Phase Notice to Proceed	5.00%	5.00%
A-2	Roadside Toll System Development and Administration	Project Management Documents Approved (PMP, Project Schedule and Baseline RTM)	3.00%	8.00%
A-3	Roadside Toll System Design	Design Documents Approved (System Detailed Design Document, Installation Drawings, Bill of Materials and RTM tracking all requirements to their design details)	12.00%	20.00%
A-4	Roadside Toll System Factory Acceptance Testing (FAT) and Installation Readiness	Testing, Installation Planning and FAT Approved (MTP, All Test Procedures, updated RTM aligning all test procedures with requirements, Installation Plan and Factory Acceptance Testing and Test Report Approved)	15.00%	35.00%
A-5	Roadside Toll System Onsite Installation Testing (OIT)	Onsite Installation Testing Approved - First Site and Production TRH	7.00%	42.00%
A-6	Roadside Toll System Manuals and Training	All Manuals Approved and Training Plan and Training Materials Approved	2.00%	44.00%
A-7	Roadside Toll System Commissioning	Installation and Commissioning Approved Ready for Go Live		
A-7a	Roadside Toll System Commissioning	Installation and Commissioning Approved Ready for Go Live - Tolling Location 1	3.00%	47.00%
A-7b	Roadside Toll System Commissioning	Installation and Commissioning Approved Ready for Go Live - Tolling Location 2	3.00%	50.00%
A-7c	Roadside Toll System Commissioning	Installation and Commissioning Approved Ready for Go Live - Tolling Location 3	3.00%	53.00%
A-7d	Roadside Toll System Commissioning	Installation and Commissioning Approved Ready for Go Live - Tolling Location 4	3.00%	56.00%
A-7e	Roadside Toll System Commissioning	Installation and Commissioning Approved Ready for Go Live - Tolling Location 5	3.00%	59.00%
A-7f	Roadside Toll System Commissioning	Installation and Commissioning Approved Ready for Go Live - Tolling Location 6	3.00%	62.00%
A-7g	Roadside Toll System Commissioning	Installation and Commissioning Approved Ready for Go Live - Tolling Location 7	3.00%	65.00%
A-7h	Roadside Toll System Commissioning	Installation and Commissioning Approved Ready for Go Live - Tolling Location 8	3.00%	68.00%
A-7i	Roadside Toll System Commissioning	Installation and Commissioning Approved Ready for Go Live - Tolling Location 9	3.00%	71.00%
A-7j	Roadside Toll System Commissioning	Installation and Commissioning Approved Ready for Go Live - Tolling Location 10	3.00%	74.00%
A-7k	Roadside Toll System Commissioning	Installation and Commissioning Approved Ready for Go Live - Tolling Location 11	3.00%	77.00%
A-7l	Roadside Toll System Commissioning	Installation and Commissioning Approved Ready for Go Live - Tolling Location 12	3.00%	80.00%
A-8	Operational Documentation	Maintenance Plan and Disaster Recovery Plan Approved	3.00%	83.00%
A-9	Training Execution	All Training Complete	2.00%	85.00%
A-10	Roadside Toll System Acceptance	Operational and System Acceptance Test Approved, As-builts Approved and Implementation Phase Closed Out	15.00%	100.00%

B. Payments Related to Hardware, Equipment and Installation

Payment Number	Hardware and Installation Pay Items (Paid as % of hardware and installation costs)	% Paid	Cum.% Paid
B-1	Materials Ordered and Verified: All Materials Ordered (Purchase Order data correlated to the BOM and submitted to NCTA for approval)	20.00%	20.00%
B-2	Materials Received and Verified: All Materials Received (Packing slips correlated to Purchase Orders correlated to the BOM and submitted to NCTA for approval. Subject to onsite verification of materials by NCTA)	20.00%	40.00%
B-3	Installation Approved		
B-3a	Installation Approved - Tolling Location 1 (Installation Checklist completed by Contractor and Approved by NCTA)	5.00%	45.00%
B-3b	Installation Approved - Tolling Location 2 (Installation Checklist completed by Contractor and Approved by NCTA)	5.00%	50.00%
B-3c	Installation Approved - Tolling Location 3 (Installation Checklist completed by Contractor and Approved by NCTA)	5.00%	55.00%
B-3d	Installation Approved - Tolling Location 4 (Installation Checklist completed by Contractor and Approved by NCTA)	5.00%	60.00%
B-3e	Installation Approved - Tolling Location 5 (Installation Checklist completed by Contractor and Approved by NCTA)	5.00%	65.00%
B-3f	Installation Approved - Tolling Location 6 (Installation Checklist completed by Contractor and Approved by NCTA)	5.00%	70.00%
B-3g	Installation Approved - Tolling Location 7 (Installation Checklist completed by Contractor and Approved by NCTA)	5.00%	75.00%
B-3h	Installation Approved - Tolling Location 8 (Installation Checklist completed by Contractor and Approved by NCTA)	5.00%	80.00%
B-3i	Installation Approved - Tolling Location 9 (Installation Checklist completed by Contractor and Approved by NCTA)	5.00%	85.00%
B-3j	Installation Approved - Tolling Location 10 (Installation Checklist completed by Contractor and Approved by NCTA)	5.00%	90.00%
B-3k	Installation Approved - Tolling Location 11 (Installation Checklist completed by Contractor and Approved by NCTA)	5.00%	95.00%
B-3l	Installation Approved - Tolling Location 12 (Installation Checklist completed by Contractor and Approved by NCTA)	5.00%	100.00%