REQUEST FOR PROPOSAL

FOR SELECTION OF MASTER SYSTEM INTEGRATOR FOR IMPLEMENTATION OF INTEGRATED COMMAND AND CONTROL CENTRE AND SMART ELEMENTS IN AGARTALA CITY

Volume 1 – Instruction to Bidder

RFP Number: ASCL/RFP/04/06

Date: 19th April 2018

Invited by:
Agartala Smart City Limited (ASCL)
5th Floor, Agartala Municipal Corporation,
Paradise Chowmuhani,
Agartala - 799001

Disclaimer

The information contained in this Request for Proposal document ("**RFP**") whether subsequently provided to the bidders, ("**Bidder/s**") verbally or in documentary form by Agartala Smart City Limited (henceforth referred to as "**ASCL**" in this document) or any of its employees or advisors, is provided to Bidders on the terms and conditions set out in this Tender Document and any other terms and conditions subject to which such information is provided.

This RFP is not an agreement and is not an offer or invitation to any party. The purpose of this RFP is to provide the Bidders or any other person with information to assist the formulation of their financial offers ("**Bid**"). This RFP includes statements, which reflect various assumptions and assessments arrived at by ASCL in relation to this scope. This Tender Document does not purport to contain all the information each Bidder may require. This Tender Document may not be appropriate for all persons, and it is not possible for the **Chief Executing Officer (CEO), ASCL** and their employees or advisors to consider the objectives, technical expertise and particular needs of each Bidder. The assumptions, assessments, statements and information contained in the Bid documents, may not be complete, accurate, adequate or correct. Each Bidder must therefore conduct its own analysis of the information contained in this RFP and to seek its own professional advice from appropriate sources.

Information provided in this Tender Document to the Bidder is on a wide range of matters, some of which may depend upon interpretation of law. The information given is not intended to be an exhaustive account of statutory requirements and should not be regarded as a complete or authoritative statement of law. ASCL accepts no responsibility for the accuracy or otherwise for any interpretation of opinion on law expressed herein.

ASCL and their employees and advisors make no representation or warranty and shall incur no liability to any person, including the Bidder under law, statute, rules or regulations or tort, the principles of restitution or unjust enrichment or otherwise for any loss, cost, expense or damage which may arise from or be incurred or suffered on account of anything contained in this RFP or otherwise, including the accuracy, reliability or completeness of the RFP, and any assessment, assumption, statement or information contained therein or deemed to form part of this RFP or arising in any way in this Selection Process.

ASCL also accepts no liability of any nature whether resulting from negligence or otherwise howsoever caused arising from reliance of any Bidder upon the statements contained in this RFP. ASCL may in its absolute discretion, but without being under any obligation to do so, can amend or supplement the information in this RFP.

The issue of this Tender Document does not imply that ASCL is bound to select a Bidder or to appoint the Selected Bidder (as defined hereinafter), for implementation and ASCL reserves the right to reject all or any of the Bidders or Bids without assigning any reason whatsoever.

The Bidder shall bear all its costs associated with or relating to the preparation and submission of its Bid including but not limited to preparation, copying, postage, delivery fees, expenses associated with any demonstrations or presentations which may be required by ASCL or any other costs incurred in connection with or relating to its Bid. All such costs and expenses will remain with the Bidder and ASCL shall not be liable in any manner whatsoever for the same or for any other costs or other expenses incurred by a Bidder in preparation for submission of the Bid, regardless of the conduct or outcome of the Selection process.

Important Dates

S. No.	Activity	Deadline
1.	Release of RFP	19/04/2018
2.	Last date of receipt of pre-bid queries on RFP	26/04/2018
3.	Pre-bid Meeting date	27/04/2018
4.	Posting of response to queries	07/05/2018
5.	Bid Submission start date	08/05/2018
6.	Last date for submission of Bids	21/05/2018
7.	Bid Opening Date	22/05/2018

Table of Contents

Definitions/Acronyms

Terms	Meaning
Authority/ ASCL	Agartala Smart City Limited
AMC	Agartala Municipal Corporation
AMC	Annual Maintenance Contract
BEC	Bidders Evaluation Committee
BOM	Bill of Material
CCTV	Closed Circuit Television
CEO	Chief Executive Officer
DD	Demand Draft
EMD	Earnest Money Deposit
GIS	Geographical Information Systems
GPS	Global Positioning System
HOD	Head of Department
ICCC	Integrated Command and Control Centre
ICT	Information and Communication Technology
INR	Indian Rupee
LoI	Letter of Intent
SI	System Integrator
UoM	Unit of Measurement
OEM	Original Equipment Manufacture
O&M	Operations & Maintenance
PBG	Performance Bank Guarantee
PDD	Proposal Due Date
PoC	Proof of Concept
PQ	Pre-Qualification
RFP	Request for Proposal
SLA	Service Level Agreement
SOP	Standard Operating Procedures
TQ	Technical Qualification
TRV	Total Revenue
UAT	User Acceptance Testing
VM	Virtual Machine
NIT	Notice Inviting Tender

1. Introduction

The Ministry of Urban Development, Government of India (GoI) has rolled out Smart City Mission on 25 June, 2015. Agartala was selected among 100 cities to be developed as smart city in India due to various achievements, initiatives and all-inclusive approach. Accordingly Agartala city had submitted "Smart City Proposal" (SCP) to Ministry of Urban Development, Government of India with required consent of Tripura government and statutory authority of Agartala Municipal Corporation.

Agartala has been selected to be developed into a smart city under the fast track round of the Smart Cities Mission. The Smart City Proposal of Agartala includes the smart city solutions which involve the use of technology, information and data to improve infrastructure and services within the city of Agartala (The Smart Solutions Projects).

Agartala Smart City Limited (ASCL) now intends to select a Master System Integrator for the Implementation of Integrated Command and Control Centre (ICCC) and other smart elements in Agartala.

1.1 Introduction to Agartala Smart City Project

The ASCL, has identified certain Smart ICT intervention required to make the city smart. The proposed solution under PAN City Solution ranges from Traffic Management, Bus Tracking and Information system, City Surveillance system to Integration of every components with Integrated Command and Control centre. The scope of Pan City projects is shown below:

Modernization of Junctions, Traffic Nodes cum Safety and Security	**Smart Bus Stop/Shelters with Modern Information Systems**	**Passenger Information System (PIS) in Different Locations**
Vehicular Monitoring System (VMS)	**Electronic Ticketing Machine (ETM)**	**Integrated Control and Operation Centre**
City Wide Wi-Fi	**Optical Fibre Cable**	**Signage**
Bus Stand cum Depot Infrastructure	**Information and Communication System**	**Digital Information Kiosk**

The city will implement most of the smart elements as identified in the Smart City Proposals. Along with the implementation of all other elements city will also implement an Integrated Command and Operation Centre (hereafter referred as ICCC). The ICCC will integrate with all other components getting implemented. ICCC will also manage, monitor and control the functioning of all these components.

1.2 RFP Format

The intent of this RFP is to invite bids from the Bidders for implementation of Integrated Command and Operation Centre and Smart Elements in Agartala for the Authority. The project also includes integration of city applications with Integrated Command and Operation Centre in Agartala for ASCL.

The Request for Proposal (RFP) consists of three volumes viz.

1. **RFP Volume 1: Instruction to Bidders**

   Volume 1 details the instructions with respect to the bid process management, technical evaluation framework, and the technical & financial forms.

2. **RFP Volume 2: Scope of work including Functional & Technical Specifications**

   Volume 2 of the RFP provides information regarding the Project Implementation Plan, business requirements/applications to be covered and corresponding process related documentation, scope of work for the selected bidder and functional requirements timelines and payment schedule.

3. **RFP Volume 3: Master Service Agreement**

   Volume 3 contains the contractual, legal terms & conditions applicable for the proposed engagement.

1.3 Fact sheet

Sl. No.	Items	Description
1.	Name of Assignment	Request for Proposal for Selection of Master System Integrator (MSI) for implementation of Integrated Command and Control Center and Smart Elements in Agartala City
2.	Method of Selection	The method of selection is QCBS (Quality Cum Cost based selection). The weightage given to the technical and financial score will be 70% and 30% respectively. The contract will be awarded to the bidder scoring maximum marks after technical and financial valuations as per qualifying criteria.
3.	Availability of RFP document	Download from www.smartnet.niua.org www.agartalacity.tripura.gov.in www.tripura.gov.in https://tripuratenders.gov.in
4.	Date of RFP Issuance	19th April 2018

Sl. No.	Items	Description
5.	Tender Processing Fee (Non- refundable and Not-Exempted)	Indian Rupees 25,000 (Indian Rupees Twenty Five Thousand only), in form of demand Draft or Banker's cheque
6.	Bid Security/ Earnest Money Deposit (EMD)	INR 2.00 Crores (INR 20,000,000/-)
7.	Last date and time for Submission of Pre-bid Queries	26th April 2018; 16:00 Hours
8.	Pre-Bid Conference time, date & Venue	27th April 2018; 12:30 Hours ASCL office, AMC City Centre, 5th Floor , Agartala - 799001
9.	Posting of responses to queries (on website)	www.smartnet.niua.org www.agartalacity.tripura.gov.in www.tripura.gov.in https://tripuratenders.gov.in
10.	Last Date and time for Bid/Bid submission (On or before)	21st May 2018 16:00 Hours • Online (through e-procurement portal)
11.	Date, time for Opening of Pre- Qualification Bids	22nd May 2018 16:00 Hours
12.	Bid validity	Bid must remain valid up to 180 (One Hundred & Eighty) days from the last date of submission of bid extendable upon request by authority
13.	Currency	Currency in which the Bidders may quote the price and will receive payment is INR only.
14.	Tender Inviting Authority	Agartala Smart City Limited
15.	Name and Address for Correspondence/ city survey/For original EMD submission	CEO, ASCL 5th Floor, AMC, Paradise Chowmuhani Agartala, Tripura West Pin – 799001 agartalasmartcityltd @gmail.com
16.	Mode of Tender Submission	Online
17.	E-tendering	• The bid document shall be available in the prescribed form through e-procurement application https://tripuratenders.gov.in.

Sl. No.	Items	Description
		• To participate in the bid, the bidder shall have a valid **Class 2/ Class 3 Digital Signature certificate (DSC)**, obtained from either of the certifying authorities, enlisted by Controller of Certifying Authorities (CCA) at http://cca.gov.in • The Bidder shall enrol himself/herself in the e-procurement website: https: //tripuratenders.gov.in and obtain User ID and Password for bidding.

Note: All the above mentioned time are as per clock time of e-procurement website https://tripuratenders.gov.in

2. Instruction to Bidders

General

a. While every effort has been made to provide comprehensive and accurate background information, requirements and envisaged solution(s) specifications, Bidders must form their own conclusions about the solution(s) needed to meet the Authority's requirements. Bidders and recipients of this RFP may wish to consult their own legal advisers in relation to this RFP.

b. All information supplied by Bidders as part of their bids in response to this RFP, may be treated as contractually binding on the Bidders, on successful award of the assignment by the Authority on the basis of this RFP.

c. No commitment of any kind, contractual or otherwise shall exist unless and until a formal written contract has been executed by or on behalf of Authority. Any notification of preferred bidder status by Authority shall not give rise to any enforceable rights by the Bidder. Authority may cancel this public procurement at any time prior to a formal written contract being executed by or on behalf of Authority.

d. Bids shall be received by the Authority on the websites as mentioned in the fact sheet before the time and date specified in the schedule of the tender notice. The Authority may, at its discretion, extend this deadline for submission of offers by issuing corrigendum and uploading the same on websites mentioned in the fact sheet.

e. Bid received through any other mode of communication except through web portals (email, print out, telex, cable or facsimile offers) will be rejected.

2.1 Eligible Bidders

Bids may be submitted by either of the following categories of Bidders only:

The Bidder shall be either a Single Entity or a Consortium of companies/ corporations as described below.

Sole Bidder	• Must be a System Integrator company which has the capabilities to deliver the entire scope as mentioned in the RFP • Cannot bid as part of any other consortium bid under this RFP • Could be an Indian or International firm • Should be registered under the Companies Act 1956 in India or any equivalent foreign act • Should be in operation in India or abroad for a period of at least 7 years as on publication of bid • For an International Bidder, Bidder will have to register as company under companies Act, 1956/2013 within 6 months of Issuing LOA

Consortium #	• Maximum of 3 companies are allowed in a consortium including Lead Bidder • Consortium member could be an Indian or International firm • All the member should be registered in India under Companies Act 1956/2013 or any equivalent foreign act • For an International Bidder, Bidder will have to register company under companies Act, 1956/2013 within 6 months of Issuing LOA • The Lead bidder shall be jointly and severally responsible for complete scope including meeting the SLAs, whereas consortium partners shall be severally responsible only for its respective scope.

- # In case of consortium, the list of participants need to be declared
- Consortium members cannot be changed during the project period.
- Any of the Lead Bidders/ non lead bidders cannot be a Consortium Member with any other bid.
- It is the responsibility of the lead Bidder to ensure that all the other Consortium Members in the bid are compliant to all the clauses as mentioned in the bid, failing which bid can be disqualified.

The Lead Bidder shall be authorized by the consortium members for

1. The management of all Consortium members
2. The Lead Bidder would have the sole responsibility of ensuring the delivery of products and services mentioned in all volumes of this RFP. The Lead Bidder would also be responsible for ensuring the successful execution of integrated solution including meeting the SLAs. The list of Consortium Members needs to be declared in the bid which cannot be changed by the bidder later on. Any change in the consortium partner will need to be approved by Authority.
3. To incur liabilities and receive instructions for and on behalf of any and all consortium members.
4. Entire execution of the Contract, receipt of payments etc. on behalf of consortium
5. Ensuring that all the bid compliance are met by the consortium members (mentioned in the bid, failing which bid can be disqualified)
6. The supply, delivery and installation of all products and services in their bid and as part of the contract
7. Responsible for the functioning of the proposed solution in totality to meet the Authority requirements outlined in the RFP

Consortium Conditions

1. The number of consortium members cannot exceed three, including the Lead Bidder

2. The entity submitting the Bid as a Lead Bidder cannot be a Consortium partner of any other Bidder
3. The Consortium partners cannot be Sole Bidder/Lead Bidder/Consortium Partner with another Bidder in a separate Bid submitted against this RFP.
4. The Sole Bidder cannot be a Lead Bidder or Consortium partner of any other Bidder
5. Consortium members must provide a Memorandum of Understanding (MoU) as per Annexure – 7, covering above points and showing their intention to enter into such an Agreement at the time of bidding along with Pre-Qualification Bid.

Bidders are encouraged to include Micro, Small and Medium Enterprises (MSMEs) in the delivery of the project.

2.2 Compliant Bids/Completeness of Response

a. Bidders are advised to study all instructions, forms, terms, requirements and other information in the RFP documents carefully. Submission of the bid shall be deemed to have been done after careful study and examination of the RFP document with full understanding of its implications.

b. Failure to comply with the requirements of this paragraph may render the bid non-compliant and the Bid may be rejected. Bidders must:

   i. Include all documentation specified in this RFP, in the bid.

   ii. Follow the format of this RFP while developing the bid and respond to each element in the order as set out in this RFP.

   iii. Comply with all requirements as set out within this RFP.

2.3 Bidder to Inform

The Bidder shall be deemed to have carefully examined the Terms & Conditions, Scope, Service Levels, Specifications, and Schedules of this RFP. If bidder has any doubts/clarifications as to the meaning of any portion of the Conditions or the specifications he shall, before the last date for Submission of Pre-Bid Queries, set forth the particulars thereof and submit them to Authority in writing in order that such doubt may be removed or clarifications are provided.

2.4 Bid Preparation costs

The Bidder shall bear all costs associated with the preparation and submission of its bid, for the purposes of clarification of the bid, if so desired by the Authority.

2.5 Pre-bid meeting & Clarification

2.5.1 Bidders Queries

Any clarification regarding the RFP document and any other item related to this project can be submitted to Authority as per the submission mode and timelines mentioned in the Fact Sheet. The pre-bid queries should be submitted through e-mail in the editable excel sheet format only (Annexure I), along with covering letter specifying name and details of the organization submitting the queries. No query will be accepted after the last date of receiving queries.

Authority shall not be responsible for ensuring that the bidders' queries have been received by them. Any requests for clarifications post the indicated date and time shall not be entertained by Authority.

2.5.2 Responses to Pre-Bid Queries and Issue of Corrigendum

Authority will organize a pre-bid conference and will respond to any request for clarification or modification of the bidding documents. Authority shall formally respond to the pre-bid queries after the pre-bid conference. No further clarifications shall be entertained after the date and time of submission of queries.

Pre-bid meeting will be held on the date and venue indicated in Section 1.3 of the RFP Volume 1. Only Lead Bidders & Consortium Partners are allowed to attend the pre-bid meeting.

Authority shall endeavor to provide timely response to all queries. However, Authority makes no representation or warranty as to the completeness or accuracy of any response made in good faith. Authority does not undertake to answer all the queries that have been posed by the bidders.

Any modifications of the RFP Documents, which may become necessary as a result of the Pre-Bid Conference, shall be made by Authority exclusively through a corrigendum. Any such corrigendum shall be deemed to be incorporated into this RFP. However, in case of any such amendment, the bid submission date may be extended at the discretion of Authority.

Any corrigendum/notification issued by Authority, subsequent to issue of RFP, shall only be available/hosted on the web portals mentioned in the fact sheet. Any such corrigendum shall be deemed to be incorporated into this RFP.

2.6 RFP Document Fee

1. RFP can be downloaded from the web portals mentioned in the fact sheet.
2. Tender Processing Fee as indicated in the fact sheet. The tender fee shall be non-refundable.
3. Without the payment of tender fee the bids will be taken as incomplete and non-responsive and shall be rejected.

2.7 Earnest Money Deposit (EMD)

1. The Bid shall contain EMD amount of INR. 200, 00,000/- (Indian Rupees Two Crores only) in the form of Bank Guarantee (Annexure 5(b)). The EMD shall be from a Nationalized Bank/ Scheduled

bank payable on demand at any of the bank branch at the Agartala. No exemption for submitting the EMD will be given to any agency. EMD/Bid security in any other form will not be entertained. The EMD shall be valid for a period of 225 days and extendable upon request by the Authority, from the date of last date of submission of bid. The Bidders shall upload the scanned copy of Bank Guarantee in the e-portal along with the Technical Bid documents. However, the original Bank Guarantee shall be submitted by the Bidder to the Authority on or before the time & date fixed for opening of the Technical Bids. Failure to do so, the Bid will be treated as non-responsive and will be rejected.

2. For Unsuccessful Bidders: The Bid Security of all Unsuccessful Bidders would be returned without interest, after submission of Performance Bank Guarantee / Additional bank guarantee by the Successful Bidder.
3. For Successful bidders: The Bid Security, for the amount mentioned above, of Successful Bidder would be returned without interest upon submission of Performance Bank Guarantee / additional bank guarantee by the Successful Bidder.
4. The Bidder shall be disqualified from the evaluation process if the prescribed EMD is not submitted (scanned copy as well as the original BG) along with the bid.
5. The Bid Security may be forfeited in any of the following circumstances:
   - If a Bidder withdraws its bid during the period of bid validity; or
   - In the case of a successful Bidder, if s/he fails to submit the Performance Bank Guarantee and/or sign the Contract in accordance with this RFP

2.8 Bid Validity Period

Bid shall remain valid for the time period mentioned in the Fact Sheet.

On completion of the validity period, unless the Bidder withdraws his bid in writing, it will be deemed to be valid until such time that the Bidder formally (in writing) withdraws his bid.

The two bids system shall be followed. Technical and Commercial Offers shall be uploaded separately through the e - Procurement portal.

2.9 Contents of Bid

Document Set	Name of Document	Content
One	RFP Document fee & Earnest Money Deposit	a. RFP Document Fee receipt b. Earnest Money Deposit (EMD) receipt
Two	Pre-Qualification Bid	a. Pre-Qualification bid as per Section 6.1 and 6.2 along with the required supporting documents.

		b. No Deviation Certificate as per Section 6.6 c. Total Responsibility as per section 6.7 d. Declaration as per Section 6.5
Three	Technical bid	a. Technical Bid as per Section 7 : Formats for submission of the Technical Bid along with the required supporting documents b. Response to Functional Requirement Specification (FRS) and Technical Requirement Specifications(TRS) c. Proof of Concept and Presentation to the Authority/ Committee appointed by the Authority
Four	Commercial Bid	Commercial Bid

- Please note that prices should NOT be indicated in the Technical Bid but should only be indicated in the Commercial Bid.
- All the pages of the bid must be sequentially numbered. The bid documents must contain in the beginning of the document, a list of contents with page numbers. Any deficiency in the documentation may result in the rejection of the Bid.
- The original bid shall be prepared in indelible ink. It shall contain no interlineations or overwriting, except as necessary to correct errors made by the Bidder itself. Any such corrections must be initialed by the person (or persons) who sign(s) the bids.
- All pages of the bid shall be initialed and stamped by the person (or persons) who sign the bid.
- Failure to submit the bid before the submission deadline specified in the Fact Sheet would cause a bid to be rejected.
- Authority will not accept delivery of bid by fax, e-mail or in person and shall only be through web sites as mentioned in the Fact Sheet.

2.10 Bid Formats

Bidder shall prepare compliance documents against each of the serial numbers of the Pre-Qualification Bid format given below in pdf format as per the nomenclature given in the column "Doc Ref" and these PDF documents shall be uploaded in the web portal as part of Pre-Qualification Bid

2.10.1 Pre-Qualification Bid Format

Section #	Section Heading	Details	Doc Ref
1.	Pre-qualification checklist	As per format provided in Annexure 2 section 6.1	QP-1
2.	Pre-Qualification Bid Covering Letter	As per format provided in Annexure 2 section 6.2	QP-2

Section #	Section Heading	Details	Doc Ref
3.	Consortium Agreement	As per format provided in Annexure 7 of this Volume section 12	QP-3
4.	Company Profile (about the Sole Bidder / Lead Bidder & Consortium Members)	As per format provided in Annexure 2 section 6.3	QP-4
5.	Power of Attorney	Documentary evidence as per format provided in Annexure 8 and 9	QP-5
6.	Project Experience	Citation details of projects as per format in Section 7.4 and 6.8 as applicable.	QP-6
7.	No Deviation Certificate	As per format provided in Annexure 2 section 6.6	QP-7
8.	Total responsibility certificate	As per format in Annexure 2 Section 6.7	QP-8

2.10.2 Technical Bid Format

Bidder shall prepare compliance documents against each of the serial numbers of the Technical Bid format given below in pdf format as per the nomenclature given in the column "Doc Ref" and these pdf documents shall be uploaded in the e-procurement portal as part of Technical Bid

Section #	Section Heading	Details	Doc Ref
1.	Technical Bid Checklist	As per format provided in Annexure 3 section 7.1	TB-1
2.	Technical Bid covering letter	As per format provided in Annexure 3 section 7.2	TB-2
3.	Compliance to Requirement (Technical/Functional Specifications)	As per format in Annexure 3 Section 7.8	TB-3
4.	Proposed Bill of Materials	As per format in Annexure 3 Section 7.9	TB-4
5.	Project/ Credential Summary	As per format provided in Annexure 3 section 7.3	TB-5
6.	Bidder's Experience	Project citation as per format provided in Annexure 3 section 7.4 and supporting documentary evidences and Self-	TB-6

Section #	Section Heading	Details	Doc Ref
		certifications as per format in Annexure 2 section 6.8 as applicable	
7.	Project Plan and Resources	• Project plan as per format provided in Annexure 3section 7.5.2 • Manpower plan as per format provided in Annexure 3section 7.5.3 I & II • Summary of resources as per format provided in Annexure 3 section 7.6.1 • CV of resources as per format provided in Annexure 3 section 7.7	TB-7
8.	Manufacturers'/Producers' Authorization Form	As per format provided in Annexure 3 section 7.10	TB-8
9.	Anti – Collusion Certificate	As per format provided in section Annexure 3 7.11	TB-9
10.	Non – disclosure Agreement	As per format provided in Annexure 6	TB-10
11.	Details of additional components mentioned as others in the BoQ	As per format specified in Annexure 3 Section 7.12	TB-11
12.	Tax Form	As per the format specified in the Annexure 3 Section 7.13	TB-12

2.10.3 Commercial Bid Format

The Bidder must submit the Commercial Bid is the formats specified in Section 8.

Section #	Section Heading	Details
1.	Total Price Summary	As per format provided in Annexure 4 Section 8.1
2.	Price component for CAPEX	As per format provided in Annexure 4 Section 8.2
3.	Price component for OPEX	As per format provided in Annexure 4 Section 8.3

2.11 Language

The bid should be prepared and submitted by the bidders in English language only. If any submitted supporting documents are in any language other than English, translation of the same in English language is to be provided (duly attested) by the Bidders. For purposes of interpretation of the documents, the English translation shall govern.

2.12 Submission of Bid

Bidders mandatorily need to submit Scanned copy of RFP Fees, EMD, PQ response, Technical Response & Commercial Response through e-Procurement Portal only within the date & time mentioned in the Fact Sheet of this RFP.

2.13 Authentication of Bids

Bid should be accompanied by an authorization in the name of the signatory (or signatories) of the Bid. The authorization shall be in the form of a written power of attorney accompanying the Bid or in any other form demonstrating that the representative has been duly authorized to sign as indicated in Annexure 8 & 9.

2.14 Amendment of Request for Proposal

At any time prior to the due date for submission of bid, Authority may, for any reason, whether at its own initiative or in response to a clarification requested by prospective bidder(s), modify the RFP document by amendments. Such amendments shall be uploaded on the e-procurement portal website, through corrigendum and shall form an integral part of RFP document. The relevant clauses of the RFP document shall be treated as amended accordingly.

It shall be the responsibility of the prospective bidder(s) to check the e-Procurement Portal from time to time for any amendment in the RFP document. In case of failure to get the amendments, if any, Authority shall not be responsible.

In order to allow prospective bidders a reasonable time to take the amendment into account in preparing their bids, Authority, at its discretion, may extend the deadline for submission of bids. Such extensions shall be uploaded on e-Procurement Portal.

2.15 Bid Price

Commercial Bid shall be as per the format provided in Section 8. Bidders shall give the required details of all applicable taxes, duties, other levies and charges etc. in respect of direct transaction between Authority and the Bidder.

Bidders shall quote for the entire scope of contract on an “overall responsibility” basis such that the total bid price covers Bidder’s all obligations mentioned in or to be reasonably inferred from the bidding documents in respect of providing the product/services.

Prices quoted by the Bidder for line item rates shall remain firm during the entire contract period and not subject to price variation on any account.

2.16 Deviations and Exclusions

Bids shall be submitted strictly in accordance with the requirements and terms & conditions of the RFP. The Bidder shall submit a No Deviation Certificate as per the format mentioned in Section 6.6. The bids with deviation(s) are liable for rejection.

2.17 Total Responsibility

Bidder should issue a statement undertaking total responsibility for the defect free operation of the proposed solution as per the format mentioned in Section 6.7.

2.18 Late Bids

Late submission will not be entertained and will not be permitted.

The bids submitted by telex/print out/telegram/fax/e-mail etc. shall not be considered. No correspondence will be entertained on this matter.

Authorities shall not be responsible for any non-receipts/non-delivery of the documents due to technical snag whatsoever at Bidder's end. No further correspondence on the subject will be entertained.

Authority reserves the right to modify and amend any of the above-stipulated condition/criterion.

2.19 Right to Terminate the Process

Authority may terminate the RFP process at any time and without assigning any reason. Authority makes no commitments, express or implied, that this process will result in a business transaction with anyone. This RFP does not constitute an offer by Authority.

2.20 Non-Conforming bids

A bid may be construed as a non-conforming bids and ineligible for consideration:

a. If it does not comply with the requirements of this RFP.

b. If a bid does not follow the format requested in this RFP or does not appear to address the particular requirements of the solution.

2.21 Acceptance/Rejection of Bids

a. Authority reserves the right to reject in full or part, any or all bids without assigning any reason thereof. Authority reserves the right to assess the Bidder's capabilities and capacity. The decision of Authority shall be final and binding.

b. Bid should be free of over writing. All erasures, correction or addition must be clearly written both in words and figures and attested.

In the event of any assumptions, presumptions, key points of discussion, recommendation or any points of similar nature submitted along with the Bid, Authority reserves the right to reject the Bid and forfeit the EMD.

2.22 Confidentiality

All the material/information shared with the Bidder during the course of this procurement process as well as the subsequent resulting engagement following this process with the successful bidder, shall be treated as confidential and should not be disclosed in any manner to any unauthorized

person under any circumstances. The employees of the successful Lead bidder and Consortium members who are proposed to be deployed on the project need to furnish a Non-Disclosure Agreement (NDA) as per Annexure 6, Section 11.

2.23 Disqualification

The bid is liable to be disqualified in the following cases or in case bidder fails to meet the bidding requirements as indicated in this RFP:

a. During validity of the bid, or its extended period, if any, the bidder changes its quoted prices.

b. The bidder's bid is conditional and has deviations from the terms and conditions of RFP.

c. Bid is received in incomplete form.

d. Bid is not accompanied by all the requisite documents.

e. Information submitted in technical bid is found to be misrepresented, incorrect or false, accidentally, unwittingly or otherwise, at any time during the processing of the contract (no matter at what stage) or during the tenure of the contract including the extension period if any.

f. Financial bid is enclosed with the same document as technical bid.

g. Bidder tries to influence the bid evaluation process by unlawful/corrupt/fraudulent means at any point of time during the bid process

h. In case any one party / same consortium submits multiple bids or if common interests are found in two or more Bidders with reference to Section 2.2 (b), the bidders are likely to be disqualified, unless additional bids/bidders are withdrawn upon notice immediately.

i. Bids without EMD will be disqualified

2.24 Key Personnel

Authority has identified certain key positions, which are minimum in requirement and minimum qualifications for each of the positions that should be part of project team of the bidder (hereby referred to as "key personnel"). Details of these key positions are provided in Section 3.6.3

2.24.1 Initial Composition; Full Time Obligation; Continuity of Personnel

Bidder shall ensure that each member of the Key Personnel devotes substantial working time as per the staffing schedule/ manpower plan to perform the services to which that person has been assigned as per the bid.

Bidder shall not make any changes to the composition of the Key Personnel and not require or request any member of the Key Personnel to cease or reduce his or her involvement in the provision of the Services during the defined term of the engagement unless that person resigns, is terminated for cause, is long-term disabled, is on permitted mandatory leave under Applicable Law or retires.

In any such case, the Authority's prior written consent would be mandatory.

2.24.2 Evaluations

Bidder shall carry out an evaluation of the performance of each member of the Key Personnel in connection with the Services at least once in each Contract Year. Bidder shall provide reasonable written notice to Authority of the date of each evaluation of each member of the Key Personnel. Authority shall be entitled to provide inputs to the bidder for each such evaluation. Bidder shall promptly provide the results of each evaluation to Authority, subject to Applicable Law.

2.24.3 Replacement

In case any proposed resource resigns, then the Bidder has to inform Authority within one week of such resignation.

Bidder shall ensure that key personnel role is not vacant at any point in time during the contract period.

Before assigning any replacement member of the Key Personnel to the provision of the Services, Bidder shall provide Authority with:

a. A resume, curriculum vitae and any other information about the candidate that is reasonably requested by Authority; and

b. An opportunity to interview the candidate.

The bidder has to provide replacement resource of equal or better qualification and experience as per the requirements of this RFP.

If Authority objects to the appointment, Bidder shall not assign the individual to that position and shall seek an alternative candidate in accordance with the resource requirements of this RFP.

The bidder needs to ensure at least 4 weeks of overlap period in such replacements. Authority will not be responsible for any knowledge transition to the replacement resource and any impact/escalation of cost incurred by the bidder due to resource replacement.

2.24.4 High Attrition

If in the first 6 month period from the Contract Effective Date and in any rolling 12 months period during the Term of contract, 15 percent or more of the members of the Key Personnel cease or reduce their involvement in the Services for any reason other than with Authority's prior written consent, Bidder shall:

a. Provide Authority with a reasonably detailed explanation as to the reasons for such change, including, where applicable and permitted, notes from any exit interviews conducted by Bidder with any departing member of the Key Personnel; and

b. If such change to Key Personnel has or is likely to have any material adverse impact on the provision of the Services or any substantial part thereof, undertake, at its own costs, such remediation acts as are reasonably necessary in order to improve the retention of the Key Personnel including making reasonable changes to the human resources policies and

procedures applicable to the Key Personnel (including those related to compensation, benefits and other conditions so that they are competitive with the market) as may be necessary to ensure that such policies and procedures comply with Good Industry Practice.

c. For any replacement of key personnel penalty will be levied as given in Volume III Section B "Special Conditions of the contract" clause "Termination".

2.25 Fraud and Corrupt Practices

a. The Bidders and their respective officers, employees, agents and advisers shall observe the highest standard of ethics during the Selection Process. Notwithstanding anything to the contrary contained in this RFP, Authority shall reject a Bid without being liable in any manner whatsoever to the Bidder, if it determines that the Bidder has, directly or indirectly or through an agent, engaged in corrupt practice, fraudulent practice, coercive practice, undesirable practice or restrictive practice (collectively the "Prohibited Practices") in the Selection Process. In such an event, Authority shall, without prejudice to its any other rights or remedies, forfeit and appropriate the EMD or PBG, as the case may be, as mutually agreed genuine pre-estimated compensation and damages payable to Authority for, inter alia, time, cost and effort of Authority, in regard to the RFP, including consideration and evaluation of such Bidder's Bid.

b. Without prejudice to the rights of Authority under Clause above and the rights and remedies which Authority may have under the LOI or the Agreement, if a Bidder is found by Authority to have directly or indirectly or through an agent, engaged or indulged in any corrupt practice, fraudulent practice, coercive practice, undesirable practice or restrictive practice during the Selection Process, or after the issue of the LOI or the execution of the Agreement, such Bidder shall not be eligible to participate in any tender or RFP issued by Authority during a period of 3 years from the date such Bidder is found by Authority to have directly or through an agent, engaged or indulged in any Prohibited Practices.

c. For the purposes of this Section, the following terms shall have the meaning hereinafter respectively assigned to them:

   i. "corrupt practice" means (i) the offering, giving, receiving, or soliciting, directly or indirectly, of anything of value to influence the action of any person connected with the Selection Process (for avoidance of doubt, offering of employment to or employing or engaging in any manner whatsoever, directly or indirectly, any official of Authority who is or has been associated in any manner, directly or indirectly with the Selection Process or the LOI or has dealt with matters concerning the Agreement or arising there from, before or after the execution thereof, at any time prior to the expiry of one year from the date such official resigns or retires from or otherwise ceases to be in the service of Authority, shall be deemed to constitute influencing the actions of a person connected with the Selection Process); or (ii) save as provided herein, engaging in any manner whatsoever, whether during the Selection Process or after the issue of the LOA or after

the execution of the Agreement, as the case may be, any person in respect of any matter relating to the Project or the Award or the Agreement, who at any time has been or is a legal, financial or technical consultant/adviser of Authority in relation to any matter concerning the Project;

ii. "fraudulent practice" means a misrepresentation or omission of facts or disclosure of incomplete facts, in order to influence the Selection Process;

iii. "coercive practice" means impairing or harming or threatening to impair or harm, directly or indirectly, any persons or property to influence any person's participation or action in the Selection Process;

iv. "undesirable practice" means (i) establishing contact with any person connected with or employed or engaged by Authority with the objective of canvassing, lobbying or in any manner influencing or attempting to influence the Selection Process; or (ii) having a Conflict of Interest; and

v. "Restrictive practice" means forming a cartel or arriving at any understanding or arrangement among Bidders with the objective of restricting or manipulating a full and fair competition in the Selection Process.

2.26 Conflict of Interest

a. A bidder shall not have a conflict of interest that may affect the Selection Process or the Solution delivery (the "Conflict of Interest"). Any Bidder found to have a Conflict of Interest shall be disqualified. In the event of disqualification, Authority shall forfeit and appropriate the EMD, if available, as mutually agreed genuine pre-estimated compensation and damages payable to Authority for, inter alia, the time, cost and effort of Authority including consideration of such Bidder's Bid, without prejudice to any other right or remedy that may be available to Authority hereunder or otherwise.

b. Authority requires that the bidder provides solutions which at all times hold Authority's interests paramount, avoid conflicts with other assignments or its own interests, and act without any consideration for future work. The bidder shall not accept or engage in any assignment that would be in conflict with its prior or current obligations to other clients, or that may place it in a position of not being able to carry out the assignment in the best interests of Authority.

c. Government of Tripura expects Bidders to provide professional, objective, and impartial advice and at all times hold the Client's interests paramount, without any consideration for future work, and strictly avoid conflicts with other assignments or their own corporate interests. Bidders shall not be hired for any assignment that would be in conflict with their prior or current obligations to other clients, or that may place them in a position of not being able to carry out the assignment in the best interest of the Client.

d. Bidders or any of their affiliates / key personnel shall not be hired for any assignment which, by its nature, may be in conflict with another assignment of the bidder.

2.27 Sub-Contracting

Sub-contracting shall be allowed only to non-IT infrastructure works. However, even if the work is sub-contracted, the sole responsibility of the work shall lie with the Lead Bidder or sole bidder. The lead bidder or sole bidder shall be held responsible for any delay/error/non-compliance etc. of its sub-contracted vendor. The details of the sub-contracting agreements (if any) between both the parties would be required to be submitted to Authority.

2.28 Inclusion of MSMEs in Project Delivery

Bidders are encouraged to include Micro, Small and Medium Enterprises (MSMEs) in the delivery of the project.

2.29 Eligible Goods and Services, and OEM Criteria:

a. For purposes of this Clause, the term "goods" includes commodities, raw material, machinery, equipment, and industrial plants; and "services" includes services such as insurance, transportation, supply, installation, integration, testing, commissioning, training, and initial maintenance.

b. The Bidder shall quote only one specific make and model of OEM, for each of the goods. Providing more than one option shall not be allowed. All goods quoted by the Bidder must be associated with item code and names and with printed literature describing configuration and functionality. Any deviation from the printed specifications should be clearly mentioned in the offer document by the Bidder.

c. The OEM for each products or technology quoted should be in the business of that product or solution or technology for at least 3 years as on the date of release of the RFP.

d. All the OEMs should have authorized presence in India either directly or through channel partner(s) as on the date of release of RFP.

e. Bidder must quote products in accordance with above clause "Eligible goods and related services.

f. During the Demonstration/Proof-of-Concept (PoC) of the field components at technical evaluation stage, the Technical Committee will give special attention to verify the quality, robustness and appropriateness of the proposed camera/other equipment for field scenario/conditions. If any brand / product are found un-suitable, Bidder may get dis-qualified or may be asked to replace the product with better brands meeting the tender requirements, without any change in commercial bid.

2.30 Right to vary quantity

a. At the time of award of contract and post award of work, the quantity of goods, works or services originally specified in the bidding documents may be increased to maximum 25 % of the present quantity. It shall be without any change in the unit prices or other terms and conditions of the Bid and the bidding documents. In the event, either the goods, works or services for which variation is sought after award of work then the same shall be done through Change Request Note. The CRN will be evaluated by a Third Party Committee formed by the Employer and the decision of the Committee will be final on the scope and rate. In case of decrease in quantity, the SPV shall have the right to decrease the quantity limited to maximum of 25% reduction of contract value only.

b. If the Authority does not procure any subject matter of procurement or procures less than the quantity specified in the bidding documents due to change in circumstances, the bidder shall not be entitled for any claim or compensation except otherwise provided in the bidding document.

c. Repeat orders for extra items or additional quantities may be placed, if it is provided in the bidding document, on the rates and conditions given in the contract if the original order was given after inviting open competitive bids. Delivery or completion period may also be proportionally increased.

2.31 Withdrawal, Substitution, and Modification of Bids

a. A Bidder may withdraw its Bid or re-submit its Bid (technical and/ or financial) as per the instructions/ procedure mentioned at e-Procurement website, if any

b. Bids withdrawn shall not be opened and processed further.

2.32 Site Visit

a. The Bidder may wish to visit and examine the site or sites and obtain for itself, at its own responsibility and risk, all information that may be necessary for preparing the bid and entering into the Contract. The costs of visiting the site or sites shall be at the Bidder's own expense.

b. The Authority will arrange for the Bidder and any of its personnel or agents to gain access to the relevant site or sites, provided that the Bidder gives the Authority adequate notice of a proposed visit of at least fourteen (14) days. Alternatively, the Authority may organize a site visit or visits concurrently with the pre-bid meeting, as specified in the RFP. Failure of a Bidder to make a site visit will not be a cause for its disqualification.

c. No site visits shall be arranged or scheduled after the deadline for the submission of the Bids and prior to the award of Contract.

3. Selection Process for Bidder

3.1 Opening of Bids

The Bids shall be opened by Authority in presence of those Bidders or their representatives who may be present at the time of opening.

The representatives of the bidders should be advised to carry the identity card or a letter of authority from the bidder firms to identify that they are bona fide representatives of the bidder firm, for attending the opening of bid.

There will be three bid-opening events

a. **Set 1 (RFP Document fee & Bid Security/EMD) and Set 2 (Pre-Qualification bid)**
b. **Set 3 (Technical bid)**
c. **Set 4 (Commercial bid)**

The venue, date and time for opening the Pre-qualification bid & technical bid are mentioned in the Fact sheet.

The Technical Bids will be evaluated only for those bidders who meet the Pre-qualification criteria.

The Commercial Bids will be opened only for those Bidders who are declared as technically qualified.

The date and time for opening of Commercial bid shall be communicated to the qualified bidders.

3.2 Preliminary Examination of Bids

Authority shall examine the bids to determine whether they are complete, whether the documents have been properly signed and whether the bids are generally in order. Any bids found to be nonresponsive for any reason or not meeting any criteria specified in the RFP, shall be rejected by Authority and shall not be included for further consideration.

Initial Bid scrutiny shall be held and bids will be treated as non-responsive, if bids are:

a. Not submitted in format as specified in the RFP document
b. Received without the Letter of Authorization (Power of Attorney)
c. Found with suppression of details
d. With incomplete information, subjective, conditional offers and partial offers submitted
e. Submitted without the documents requested
f. Non-compliant to any of the clauses mentioned in the RFP
g. With lesser validity period
h. EMD not submitted / lesser EMD validity period

i. If the Bidder gives wrong information in the Bid.

j. Canvassing in any form in connection with the Bid.

k. Bids submitted after due date and time.

l. Bids submitted by Print out/Telex/Telegram/Fax/e-mail.

m. Erasure and/or over writing is/are Not permissible

n. Bids not signed by authorized signatory

3.3 Clarification on Bids

During the bid evaluation, Authority may, at its discretion, ask the Bidder for any clarification(s) of its bid. The request for clarification and the response shall be in writing, and no change in the price or substance of the bid shall be sought, offered, or permitted. Clarifications shall be obtained only in the pre-historic information like bidders credentials etc.

3.4 Evaluation Process

Authority shall constitute a Committee to evaluate the responses of the bidders. The Committee shall evaluate the responses to the RFP and all supporting documents/documentary evidence. Inability to submit requisite supporting documents/documentary evidence by bidders may lead to rejection of their bids.

The decision of the Authority in the evaluation of bids shall be final and binding on all the Bidders. No correspondence will be entertained outside the process of evaluation with the Committee. The Tender Evaluation Committee may ask for meetings or presentation with the Bidders to seek clarifications or conformations on their bids.

The Authority reserves the right to reject any or all bids. Each of the responses shall be evaluated as per the criteria and requirements specified in this RFP.

The steps for evaluation are as follows:

3.4.1 Stage 1: Pre-Qualification

a. Authority shall validate the Set 1 "RFP Document fee & Bid Security/Earnest Money Deposit (EMD)".

b. If the contents of the Set 1 are as per requirements, Authority shall open the "Pre-Qualification Bid**". Each of the Pre-Qualification condition mentioned in Section 3.5 is MANDATORY**. In case, the Bidder does not meet any one of the conditions, the bidder shall be treated as non-responsive and will not be considered for further evaluation.

c. Bidders would be informed of their qualification/disqualification based on the Pre-Qualification criteria through the e-procurement portal and subsequently, the Bid Security amount shall be returned to the respective disqualified Bidders after the submission of Performance Bank Guarantee (PBG) by the successful Bidder. Bids of only those Bidders who

meets the Pre-Qualification criteria, shall be considered for further evaluation i.e. Stage-2: Technical Evaluation.

3.4.2 Stage 2: Technical Evaluation

a. "Technical bid" will be evaluated only for the bidders who succeed in Stage 1

b. The committee appointed by the Authority will review the technical bids of the short-listed bidders to determine whether the technical bids are substantially responsive. Bids that are not substantially responsive are liable to be disqualified at Authority's discretion.

c. The bidders' technical solutions proposed in the bid document shall be evaluated as per the requirements specified in the RFP and technical evaluation framework as mentioned in Section 3.6 & 3.6.1

d. Bidders shall make a presentation to the Authority/ Committee appointed by the Authority to supplement their bids which include the following

- Approach & Methodology including Project Experience
- Proposed Solutions
- Manpower – Technical Resources
- Proof of Concept of proposed solution

e. The Authority envisages to have proof of concept / technical demonstration to evaluate the technology & system performance for getting city business outcome; During the Demonstration/Proof-of-Concept (PoC) at technical evaluation stage, the Evaluation Committee will give special attention to verify the quality, robustness and appropriateness of the proposed Solutions/Equipment. If any brand / products are found un-suitable, Bidder may get disqualified or may be asked to replace the product with better products, meeting the tender requirements, without any change in commercial bid. Bidder may demonstrate local setup or existing deployments over network/cloud.

f. The Authority will notify the date and venue for conducting such proof of concept / technical demonstration to the prospective bidders.

g. Each Technical Bid will be assigned a technical score out of a maximum of 100 Points.

h. Only those bids who get an overall technical score of 70% (and minimum 50% in each section of the Technical Evaluation Framework as given in the section 3.6) or more of the Technical Evaluation Framework as given in Section 3.6 shall be considered technically qualified. Failing to secure minimum marks shall lead to rejection of the bids

3.4.3 Stage 3: Commercial Evaluation

a. All the technically qualified bidders will be notified to participate in Commercial Bid opening process.

b. The commercial of only those bidders which have qualified in Stage-1 & Stage -2 shall then be opened on the notified date and time and reviewed to determine whether the commercial bids are substantially responsive. Bids that are not substantially responsive are liable to be disqualified at Authority's discretion.

c. Commercial Bids that are not as per the format provided in the RFP shall be liable for rejection.

d. **Bidder shall provide breakup of all Taxes (in percentage) considered by him/her, as per the Section 7.13. However, the Authority shall consider Grand Total Price (Capex Price+ Opex Price) exclusive of applicable taxes, for evaluation purpose**.

If there is any discrepancy in the Price Bid, it will be dealt as per the following:

1. If, in the price structure quoted for the required Product and Services, there is discrepancy between the unit price and total price (which is obtained by multiplying the unit price by the quantity), only the total price/cost as quoted in the table in the Price Bid Format 1 shall prevail. The unit prices quoted in the Price Bid Format 2 shall be considered only in case of any deviations/modifications in the scope of the work in due course.
2. If there is a discrepancy between words and figures, the amount in words shall prevail.

3.4.4 Successful Bidder Evaluation

Quality and Cost based Selection (QCBS) method shall be used for evaluation of the bids, as per the formula given below:

The scores will be calculated as:

Bb = 0.7*Tb + (0.3)*(Cmin/Cb * 100)

Where,

a) Bb = overall score of bidder under consideration (calculated up to two decimal points)
b) Tb = Technical score for the bidder under consideration
c) Cb = Price quoted by the bidder under consideration
d) Cmin= Lowest price among the financial proposals under consideration

The bidder achieving the highest overall score will be invited for negotiations for awarding the contract. In case of a tie where two or more bidders achieve the same highest overall score, the bidder with the higher technical score will be invited first for negotiations for awarding the contract. In case of a tie on the technical scores and highest overall scores, the Cb will be calculated to the third place of decimal and the bidder with lesser Cb will be invited for negotiations for awarding the contract.

3.5 Pre-Qualification Criteria

#	Eligibility Criteria	Document Proof	Name to be given to the PDF file to be uploaded
1	The Sole Bidder OR Lead Bidder (in case of consortium) should be: • Could be an Indian or International Firm • Registered under the Companies Act 1956/2013 Or any equivalent foreign act • In operation in India or abroad for a period of at least 7 years as on date of bid submission **Consortium Members** • Max 3 companies are allowed in a consortium including Lead Bidder • Could be an Indian/ International firm • Should have registered in India under Companies Act 1956/2013 or any equivalent foreign act Note: • **For an International Bidder, Bidder (including Consortium Member) will have to register as company under companies Act, 1956/2013 within 6 months of issuing LOI.**	**For Sole/Lead Bidder** • Copy of Certificate of Incorporation / Registration under Companies Act 1956/2013 or any equivalent foreign act • Memorandum and Articles of Association • GST Registration Certificate • Copy of purchase orders showing at least 5 years of operations or Certified true copy of relevant extracts of balance sheet and PL statements for last 5 years **For Consortium members other than lead bidder** • Copy of Certificate of Incorporation / Registration under Companies Act, 1956/2013 or any equivalent foreign act • GST Registration Certificate • Consortium agreement clearly stating the roles and responsibilities of each member **For an International firm** Bidder (including consortium member), an undertaking for registration of company under companies Act, 1956/2013 within 6 months of Issuing LOI	**PQ_1**

#	Eligibility Criteria	Document Proof	Name to be given to the PDF file to be uploaded

2	The Bidder/ Consortium shall have an average annual turnover or INR 500 Crores over the last three (3) financial years.
	• In case of consortium
	  ○ Lead Bidder should have minimum 60% of the Turnover
	  ○ All members together should meet 500 Cr Turnover requirement
	Lead members or consortium members shall be into one of the following specific business areas
	• Specific Business Areas
	  ○ ICT Infrastructure
	  ○ Telecom Infrastructure
	  ○ IT system integration services
		The Sole Bidder or the Lead Bidder and all other members of consortium:
		• Audited statement for last 3 financial years of sole bidder
		• Audited statement for last 3 financial years of lead bidder & member companies
		• Certificate from the Statutory Auditor/ CA Certificate on turnover details from the "specific business areas" over the last 3 financial years
			PQ_2

3	The sole bidder (or Lead Bidder & all members in case of consortium) should have a positive net worth for the previous 3 financial years from the date of NIT	• Audited and Certified Balance Sheet and Profit/Loss Account of last 3 Financial Years should be enclosed • Certificate from the Statutory auditor/ CA clearly specifying the net worth of the firm	**PQ_3**
4	The bidder (or any Consortium member) shall be a licensed ISP in India and should have awarded and successfully executed at least two (2) project related to setting up of City Wide/ Campus Wide Wi-Fi project consisting of over 25 Access Points per projects during last seven (7) years	Documentary evidence (Copy of completion/ Ongoing client certificate and Work Order/ Contract) Note: Details on the supporting document is provided below as point 1	**PQ_4**
5	The bidder (or any Consortium member) should have been	Documentary evidence (Copy of completion/ Ongoing client	**PQ_5**

#	Eligibility Criteria	Document Proof	Name to be given to the PDF file to be uploaded
	awarded and successfully executed at least two (2) projects related to Integrated Traffic Management System integrating at least three (3) different components from the below list on a single application having a minimum value of INR 7 crores per project in the last seven (7) years • Controlling Traffic Signals with centralized software system • Red Light Violation Detection System • Installation of Variable Message Signboards (VMS) • Public Address System/ Emergency Call Box	certificate and Work Order/ Contract) Note: Details on the supporting document is provided below as point 1	
6	The bidder (or any Consortium member) should have been awarded and successfully executed at least two (2) projects related to Integrated Transit Management System/ Automatic Vehicle Tracking System implementing components mentioned in the list below having a minimum value of 5 crore per projects in the last seven (7) years: • Automatic Vehicle Location System for at least 200 buses (including AVL software, Hardware, etc.) • Passenger Information System at 100 locations (Integrated with AVL to	Documentary evidence (Copy of completion/ Ongoing client certificate and Work Order/ Contract) Note: Details on the supporting document is provided below as point 1	**PQ_6**

#	Eligibility Criteria	Document Proof	Name to be given to the PDF file to be uploaded
	provide route & ETA to commuters)		
7	The bidder (or any Consortium member) should have been awarded and successfully executed at least two (2) projects related to implementation of following scope in last seven (7) years • Surveillance system like CCTV surveillance system or ANPR. The project should have at least 200 cameras.	Documentary evidence (Copy of completion/ Ongoing client certificate and Work Order/ Contract) Note: Details on the supporting document is provided below as point 1	**PQ_7**
8	The bidder (or any Consortium member) should have been awarded and successfully executed at least two (2) projects related to implementation of Outside Plant Fibre Optic Passive Infrastructure of at least 100 km or Active infrastructure with at least 50 nodes per project having a minimum value of INR 5 crores per project during last seven (7) years.	Documentary evidence (Copy of completion/ Ongoing client certificate and Work Order/ Contract) Note: Details on the supporting document is provided below as point 1	**PQ_8**
9	The bidder (or any Consortium member) should have demonstrable expertise and experience of setting up or O&M of Datacentre Equipment/ Integrated command and control room /emergency response centre / Security and Surveillance control room/ City wide (NOC/SOC)/Surveillance control room built for City operations/Highways, Railway, Airport Manufacturing Plants/ Private Firms/ Private Builders and other Government establishment during last Seven	• Documentary evidence (Copy of completion/ Ongoing client certificate and Work Order/ Contract) Note: Details on the supporting document is provided below as point 1	**PQ_9**

#	Eligibility Criteria	Document Proof	Name to be given to the PDF file to be uploaded
	(7) years as on Bid Submission date of value not less than INR 10 Crore **Note:** In-house projects for their own corporation executed by the bidder shall not be considered for above purpose **Note:** In case bidder/prime bidder is a wholly owned subsidiary, the experience of parent company would be considered for eligibility		
10	The sole bidder OR the Lead bidder and each of the member of the Consortium should not be blacklisted by any Central / State Government Department or Central/State Public Sector Units (PSUs) in India as on the bid submission date	Undertaking by the authorized signatory of bidder (In case of Consortium to be provided by each member) as per format given in Annexure 2, section 6.4	**PQ_10**
11	Sole Bidder/ Lead Bidder should establish project office within 45 days of issuance of LoI in Agartala if not established earlier	Undertaking to open office in Agartala Or Copies of any two of the followings: Property Tax / Electricity / Telephone Bill / GST Registration /Lease agreement.	**PQ_11**

Notes:

1. Documentary evidence (Citation, Copy of completion / ongoing client certificate and work order / Contract/self-certificate) is required for all project experience.
   a. In case project is on-going a certificate from the Charted Accountant/Statutory Auditor has to be provided mentioning that 80% of Capex is complete.
   b. In case the experience shown is that of the bidder's parent / subsidiary /sister concern company, than the following additional documents are required:
      - Certificate signed by the Company Secretary/statutory Auditor/2 Board of Directors of the bidder certifying that the entity whose experience is shown is parent/subsidiary/sister

concern Company.

- Shareholding pattern of the bidding entity as per audit reports.

c. Bidder (or consortium member if any) may submit the Self certification, clearly mentioning project details like scope, value, duration, client details etc. as required for the evaluation criteria. The self-certificate shall be signed by at least 2 members of Board of director of the Bidder (or consortium member if any).

2. For parameter 7, the proposed project will be considered for evaluation only if its scope covers following under the individual component:
   - **Integrated Command & Control Centre (ICCC):** Assignment in which ICCC comprising of Control Room / Command and Control Room Software and Control, Management (Video wall) room, Operations room, Contact center/helpdesk are built.
3. For International project if the original client certificate and other documents are in language other than English than a translated copy duly confirmed by Indian embassy/ One of the board of directors of the lead bidder/ consortium member shall be submitted along with bid document
4. Bidder (or consortium member if any) may submit the Self certification, clearly mentioning project details like scope, value, duration, client details etc. as required for the evaluation criteria. The self-certificate shall be signed by at least 2 members of Board of director of the Bidder (or consortium member if any).
5. For projects where fee has been received in any currency other than Indian Rupees, than the foreign currency conversion rate available on Reserve Bank of India's portal as on the date of publication of the tender document shall be used for conversion of amount in foreign currency to Indian Rupees equivalent.
6. Bidders are allowed to submit experience in terms of technical qualification of their holding (parent) company or subsidiary company or Sister Concern only.
   a. a 'holding company', in relation to one or more other companies, means a company of which such companies are subsidiary companies; and
   b. a 'subsidiary company' in relation to any other company (that is to say the holding company), means a company in which the holding company— (a) controls the composition of the Board of Directors; or (b) exercises or controls more than one-half of the total share capital at its own
   c. a 'sister concern' in relation to Bidder Company, means a company whose holding company is same as bidder's holding company and holding company (a) controls the composition of the Board of Directors; or (b) exercises or controls more than one-half of the total share capital at its own
7. In case where the bidder is dependent upon the technical experience of the subsidiary company or the parent company or the sister concern, with a view to ensure commitment and involvement

of the parent/ subsidiary/sister company for successful execution of the contract, the participating bidder should enclose (i) an Agreement (as per format enclosed at Annexure 10 of this Volume) between the bidder and its parent / subsidiary/Sister concern company for fulfilling the obligation and deployment of expert during implementation phase for the Track/Component for which the experience is being used and (ii) Guarantee (as per format enclosed at Annexure 11 of this Volume) from the parent/ subsidiary/sister concern company in favor of ASCL.

3.6 Technical Evaluation Framework

The Bidder's technical solution proposed in the Technical Evaluation bid shall be evaluated as per the evaluation criteria in the following table.

Section #	Evaluation Criteria	Points
A	Sole Bidder/Lead Bidder Profile	10
B	Sole Bidder /Consortium Project Experience	40
C	Approach & Methodology & Project Presentation/Demonstration	25
D	Proposed Resources for the Project	20
E	Certificates	5
Technical Score		100

Notes:

- Bidder to submit work order and end client work in-progress (minimum 85% Project completion) / completion certificate as a supporting documents for each Project.
- Project citations of only up to one level of sub-contracting will be considered for evaluation.

Important: Qualification criteria for Technical Evaluation and progression to commercial evaluation stage:

- Minimum 50% of the maximum allotted marks in each section as given in the table above
- Minimum 70% (70 marks) of the overall technical score total

Note: Authority (or a nominated party) reserves the right to check/validate the authenticity of the information provided in the Pre-qualification and Technical Evaluation criteria and the requisite support must be provided by the Bidder.

The following sections explain how the Bidders shall be evaluated on each of the evaluation criteria:

3.6.1 Technical Bid Evaluation Criteria

<table>
<tr><th>#</th><th>Technical Evaluation Criteria</th><th>Technical Evaluation parameter</th><th>Points</th><th>Name to be given to the PDF file to be uploaded</th></tr>
<tr><td colspan="5">A. Sole Bidder/ Lead Bidder Profile</td></tr>
<tr><td>A1</td><td>Annual Turnover</td><td>The Bidder/ Consortium shall have an average annual turnover or INR 500 Crores over the last three (3) financial years.
In case of consortium
• Lead Bidder should have minimum 60% of Turnover
• All members together should meet 500 Cr Turnover requirement
Lead members or consortium members shall be into one of the following specific business areas
Specific Business Areas
• ICT Infrastructure
• Telecom Infrastructure
• IT system integration services
<table>
<tr><th>Cost of the Project (INR)</th><th>Marks</th></tr>
<tr><td>More than 1000 Crore</td><td>6</td></tr>
<tr><td>> 800 Crore to <= 1000 Crore</td><td>5</td></tr>
<tr><td>> 650 Crore to <= 800 Crore</td><td>4</td></tr>
<tr><td>> 500 crore to <= 650 Crore</td><td>3</td></tr>
</table></td><td>6</td><td>TQ_1</td></tr>
<tr><td>A2</td><td>People in organization (Full time Employees – FTE in ICT projects)</td><td>
<table>
<tr><th>Number of FTE</th><th>Marks</th></tr>
<tr><td>> 500 FTE</td><td>4</td></tr>
<tr><td>> 400 FTE to <= 500 FTE</td><td>3</td></tr>
<tr><td>> 300 FTE to <= 400 FTE</td><td>2</td></tr>
<tr><td>=< 300 FTE</td><td>1</td></tr>
</table></td><td>4</td><td>TQ_2</td></tr>
<tr><td colspan="5">B. Sole Bidder /Consortium Project Experience</td></tr>
</table>

<table>
<tr><th>#</th><th>Technical Evaluation Criteria</th><th>Technical Evaluation parameter</th><th>Points</th><th>Name to be given to the PDF file to be uploaded</th></tr>
<tr><td>B1</td><td>Wi-Fi</td><td>The bidder (or any Consortium member) shall be an ISP and should have been awarded and successfully executed at least two (2) projects related to setting up of city wide/ campus wide Wi-Fi projects consisting of 25 Access Points per projects during last seven (7) years

<table><tr><th>Number of Projects</th><th>Marks</th></tr><tr><td>> 5 projects</td><td>5</td></tr><tr><td>>2 and <= 5 projects</td><td>3</td></tr><tr><td>2 projects</td><td>1</td></tr></table></td><td>5</td><td>TQ_3</td></tr>
<tr><td>B2</td><td>Integrated Traffic Management System</td><td>The bidder (or any Consortium member) should have been awarded and successfully executed at least two (2) projects related to integrated traffic management system integrating at least three (3) different components from the below list on a single application having a minimum value of INR 7 crores per projects in the last seven (7) years:
Components:
Controlling Traffic Signals with centralized software system
Red Light Violation Detection
Installation of Variable Message Signboards (VMS)
Public Address System/ Emergency Call Box
<table><tr><th>Number of Projects</th><th>Marks</th></tr><tr><td>> 5 projects</td><td>5</td></tr><tr><td>>2 and <= 5 projects</td><td>3</td></tr><tr><td>2 projects</td><td>1</td></tr></table></td><td>5</td><td>TQ_4</td></tr>
</table>

<table>
<tr><th>#</th><th>Technical Evaluation Criteria</th><th>Technical Evaluation parameter</th><th>Points</th><th>Name to be given to the PDF file to be uploaded</th></tr>
<tr><td>B3</td><td>Transit Management System</td><td>The bidder (or any Consortium member) should have been awarded and successfully executed at least two (2) projects related to Integrated Transit Management System/ Automatic Vehicle Tracking System implementing components mentioned in the list below having a minimum value of 5 crore per projects in the last seven (7) years:
Components:
• Automatic Vehicle Location System for at least 200 buses (including AVL software, Hardware, etc.)
• Passenger Information System at 100 locations (Integrated with AVL to provide route & ETA to commuters)
<table><tr><th>Number of Projects</th><th>Marks</th></tr><tr><td>> 5 projects</td><td>5</td></tr><tr><td>>2 and <= 5 projects</td><td>3</td></tr><tr><td>2 projects</td><td>1</td></tr></table></td><td>5</td><td>TQ_5</td></tr>
<tr><td>B4</td><td>City Surveillance System</td><td>The bidder (or any Consortium member) should have awarded and successfully executed at least two (2) projects related to implementation of following scope in last seven (7) years
• Surveillance system like CCTV surveillance system or ANPR. Each project should have at least 200 cameras.
<table><tr><th>Number of Projects</th><th>Marks</th></tr><tr><td>> 5 projects</td><td>5</td></tr><tr><td>>2 and <= 5 projects</td><td>3</td></tr><tr><td>2 projects</td><td>1</td></tr></table></td><td>5</td><td>TQ_6</td></tr>
</table>

<table>
<tr><th>#</th><th>Technical Evaluation Criteria</th><th>Technical Evaluation parameter</th><th>Points</th><th>Name to be given to the PDF file to be uploaded</th></tr>
<tr><td>B5</td><td>Optical Fibre Cable Network</td><td>The bidder (or any Consortium member) should have been awarded and successfully executed at least two (2) projects related to implementation of Outside Plant Fibre Optic Passive Infrastructure of at least 100 km or Active infrastructure with at least 50 nodes per project having a minimum value of INR 5 crores per project during last seven (7) years.

<table><tr><th>Number of Projects</th><th>Marks</th></tr><tr><td>> 5 projects</td><td>5</td></tr><tr><td>>2 and <= 5 projects</td><td>3</td></tr><tr><td>2 projects</td><td>1</td></tr></table></td><td>5</td><td>TQ_7</td></tr>
<tr><td>B6</td><td>Design, Build and Maintain of Integrated Command and Control Centre</td><td>The bidder should have demonstrable expertise and experience of setting up or O&M of ICCC room/ Emergency response Centre/ Security and Surveillance Control Room/ City Wide (NOC/SOC)/ Surveillance Control Room built for Highways, Railways, Airports, Campus, Private Firms and other government establishments etc. during last seven years (as on date of submission of bid) of minimum value of 10 crore each

<table><tr><th>Number of Projects</th><th>Marks</th></tr><tr><td>> 5 projects</td><td>10</td></tr><tr><td>>2 and <= 5 projects</td><td>7</td></tr><tr><td>2 projects</td><td>3</td></tr></table></td><td>8</td><td>TQ_8</td></tr>
</table>

<table>
<tr><th>#</th><th>Technical Evaluation Criteria</th><th>Technical Evaluation parameter</th><th>Points</th><th>Name to be given to the PDF file to be uploaded</th></tr>
<tr><td>B7</td><td>Integration of ICT applications with Command and Control Center</td><td>The bidder (or any consortium member) should have been awarded and successfully executed at least two (2) projects related to implementation or integration of at least four (4) different components from the list below with integration command and Control center in the last seven (7) years
• GIS
• Parking System
• Intelligent Bus Transit System
• Fibre NOC
• CCTV Camera
• Traffic Signal/ Traffic Enforcement System/E-Challan
• Smart Lighting
• Remote public address system

<table><tr><th>Number of Projects</th><th>Marks</th></tr><tr><td>> 5 projects</td><td>10</td></tr><tr><td>>2 and <= 5 projects</td><td>7</td></tr><tr><td>2 projects</td><td>3</td></tr></table></td><td>7</td><td>TQ_9</td></tr>
<tr><td colspan="5">C. Approach & Methodology & Project Presentation/Demonstration</td></tr>
<tr><td>C1</td><td>Approach & Methodology</td><td>• Following parameters will be evaluated:<table><tr><th>Parameter</th><th>Marks</th></tr><tr><td>Understanding of the project and conformity to volume 2 : Functional Requirement</td><td>1</td></tr><tr><td>High level architecture of the solution proposed for the complete project as per the RFP</td><td>1</td></tr><tr><td>Completeness of project plan and ease of implementation (including training and change management plan)</td><td>1</td></tr><tr><td>Method of integration proposed with other IT initiatives</td><td>2</td></tr><tr><td>Identification of major risks for the projects and also propose suitable mitigation plan for each of these risks</td><td>1</td></tr></table></td><td>10</td><td>TQ_10</td></tr>
</table>

#	Technical Evaluation Criteria	Technical Evaluation parameter		Points	Name to be given to the PDF file to be uploaded
		Strategy to maintain all the SLAs and handling change requests	1		
		Detailed Business Plan highlighting Revenue Streams for relevant smart elements	1.5		
		What will be the approach towards the scalability, interoperability and modularity features considering the future expansion of the projects? (The response to this question shall be given considering growth of Smart Cities as well as new applications or systems that may be envisaged/developed in future)	1.5		

<table>
<tr><th>#</th><th>Technical Evaluation Criteria</th><th>Technical Evaluation parameter</th><th>Points</th><th>Name to be given to the PDF file to be uploaded</th></tr>
<tr><td>C2</td><td>Technical Demonstration</td><td>Following parameters will be evaluated during Technical Demonstration:

<table>
<tr><th>Parameter</th><th>Marks</th></tr>
<tr><td>Need to demonstrate the implementation of Traffic Management System with traffic signal control, ANPR, traffic violation detection</td><td>1</td></tr>
<tr><td>Need to demonstrate the implementation of AVLS, PIS system</td><td>1</td></tr>
<tr><td>Need to demonstrate Implementing Smart Poles, City Wide Wi-Fi, VMD, PAS, ECB</td><td>1</td></tr>
<tr><td>Need to demonstrate implementation of Security & Surveillance</td><td>1</td></tr>
<tr><td>Need to demonstrate the ICCC Control Room setup with visualization of smart components and integration with GIS on real time basis</td><td>3</td></tr>
<tr><td>Need to demonstrate integration of ICCC with various other components such as:
1. Traffic Management System
2. Automatic Vehicle Location System
3. CCTV & ANPR Camera
4. Wi-Fi
5. Remote public address system</td><td>3</td></tr>
</table></td><td>10</td><td>TQ_10</td></tr>
<tr><td>C3</td><td>Presentation</td><td>The Bidder will need to exhibit functional and non-functional requirements through presentation</td><td>5</td><td>TQ_11</td></tr>
<tr><td colspan="5">D. Proposed Resources for the Project</td></tr>
</table>

<table>
<tr><th>#</th><th>Technical Evaluation Criteria</th><th>Technical Evaluation parameter</th><th>Points</th><th>Name to be given to the PDF file to be uploaded</th></tr>
<tr><td>D1</td><td>People on project</td><td>Each of the following profiles suggested by the bidder will be evaluated:

<table><tr><th>Profile</th><th>Marks Allotted</th></tr><tr><td>Project Manager</td><td>5</td></tr><tr><td>Integrated Command and Control Centre Expert</td><td>3</td></tr><tr><td>Solution Architect</td><td>2</td></tr><tr><td>Integrated Traffic Management Expert</td><td>2</td></tr><tr><td>Security & Surveillance Expert</td><td>2</td></tr><tr><td>GIS Expert</td><td>2</td></tr><tr><td>Network & Security Infrastructure Expert</td><td>2</td></tr><tr><td>Server & Storage Expert</td><td>2</td></tr></table></td><td>20</td><td>TQ_12</td></tr>
<tr><td colspan="5">E. Certificates by the bidder</td></tr>
<tr><td>E1</td><td>The sole bidder or any member of consortium in a case of consortium, should possess any following certification valid at the time of Bidding:</td><td>• CMMi Level 5 certification
• CMMi Level 3 certification

<table><tr><th>Profile</th><th>Marks Allotted</th></tr><tr><td>CMMi Level 5</td><td>3</td></tr><tr><td>CMMi Level 3</td><td>1</td></tr></table>Copies of valid certificates in the name of sole bidder or the lead bidder in case of consortium</td><td>3</td><td>TQ_13</td></tr>
<tr><td>E2</td><td>The Bidder (any member of consortium) shall have following Certifications valid at the</td><td>• ISO 20000:2011 for IT Service Management or equivalent certification – 1 mark
• ISO 27001:2013 for Information Security Management System or equivalent certification – 1 mark</td><td>2</td><td>TQ_14</td></tr>
</table>

#	Technical Evaluation Criteria	Technical Evaluation parameter	Points	Name to be given to the PDF file to be uploaded
	time of Bidding:			

Notes:

1. Documentary evidence (Citation, Copy of completion / ongoing client certificate and work order / Contract/self-certificate) is required for all project experience.
   a. In case project is on-going a certificate from the Charted Accountant/Statutory Auditor has to be provided mentioning that 80% of Capex is complete.
   b. In case the experience shown is that of the bidder's parent / subsidiary /sister concern company, than the following additional documents are required:
      - Certificate signed by the Company Secretary/statutory Auditor/2 Board of Directors of the bidder certifying that the entity whose experience is shown is parent/subsidiary/sister concern Company.
      - Shareholding pattern of the bidding entity as per audit reports.
   c. Bidder (or consortium member if any) may submit the Self certification, clearly mentioning project details like scope, value, duration, client details etc. as required for the evaluation criteria. The self-certificate shall be signed by at least 2 members of Board of director of the Bidder (or consortium member if any).
2. **Important:** Minimum absolute technical score to qualify for commercial evaluation is 70 marks out of total 100 marks. However, bidder needs to mandatorily score minimum 50% marks in each of the evaluation criteria mentioned under Technical Evaluation Framework
3. For International project if the original client certificate and other documents are in language other than English than a translated copy duly verified by Indian embassy shall be submit with bid document
4. For projects where fee has been received in any currency other than Indian Rupees, than the foreign currency conversion rate available on Reserve Bank of India's portal as on the date of publication of the tender document shall be used for conversion of amount in foreign currency to Indian Rupees equivalent.
5. Bidders are allowed to submit experience in terms of technical qualification of their holding (parent) company or subsidiary company or Sister Concern only.

a. a 'holding company', in relation to one or more other companies, means a company of which such companies are subsidiary companies; and

b. a 'subsidiary company' in relation to any other company (that is to say the holding company), means a company in which the holding company— (a) controls the composition of the Board of Directors; or (b) exercises or controls more than one-half of the total share capital at its own

c. a 'sister concern' in relation to Bidder Company, means a company whose holding company is same as bidder's holding company and holding company (a) controls the composition of the Board of Directors; or (b) exercises or controls more than one-half of the total share capital at its own

6. In case where the bidder is dependent upon the technical experience of the subsidiary company or the parent company or the sister concern, with a view to ensure commitment and involvement of the parent/ subsidiary/sister company for successful execution of the contract, the participating bidder should enclose (i) an Agreement (as per format enclosed at Form 8 of this Volume) between the bidder and its parent / subsidiary/Sister concern company for fulfilling the obligation and deployment of expert during implementation phase for the Track/Component for which the experience is being used and (ii) Guarantee (as per format enclosed at Form 9 of this Volume) from the parent/ subsidiary/sister concern company in favour of ASCL.

7. Authority (or a nominated party) reserves the right to check/validate the authenticity of the information provided in the Pre-qualification and Technical Evaluation criteria and the requisite support must be provided by the Bidder.

3.6.2 Technical Demonstration of Proof of Concept during evaluation period

Objective of Technical Demonstration of POC for City Command Centre Software is to evaluate the technology & system performance for getting city business outcome;

During the Demonstration/Proof-of-Concept (PoC) at technical evaluation stage, the Technical Committee will give special attention to verify the quality, robustness and appropriateness of the proposed Solutions/Equipment and Integrated Operations Platform. If any brand / products are found un-suitable, Bidder may get dis-qualified or may be asked to replace the product with better brands meeting the tender requirements, without any change in commercial bid.

A. System Demonstration	Integrated Operations Platform Software
B. Demo Material and Set up	Demo Material – Department scope: a) Power Source b) Space for installing server and workstation Demo Material – OEM/SI Scope: Demo Setup (OEM/SI scope) at Site:
C. Performance Evaluation	Live demo and integration services

D. Suggestive Technology Selection Criteria	Bidder/OEM need to demonstrate min 3 use cases like CCTV/Parking/Govt. database/Solid Waste Management/Smart Transport/Crowd monitoring etc. along with SMS, Email, GIS in live environment.

3.6.3 Key Personnel Criteria

SI shall provide adequate number of personnel, each responsible for a specific role within the project. SI shall provide clear definition of the role and responsibility of each individual personnel.

SI shall have a defined hierarchy and reporting structure for various teams that shall be part of the project. SI has to provide the list of proposed Resources for the Project. Any changes in Resource deployment will have to be approved by the Authority.

Following table indicates the minimum qualification required for Key Positions identified for this project. However, SI shall independently estimate the teams size required to meet the requirements of Service Levels as specified as part of this tender.

Sl #	Position	Minimum Qualifications & Experience
1.	Project Manager	a) Education: MBA/MCA/M. Tech & B. Tech/B.E. (IT/Computer Science) from a recognized educational institution b) Experience: Minimum 12 years in IT sector. c) Should have more than 5 years of experience of handling such large projects as a project manager d) Should preferably have PMP or Prince2 certification e) Should preferably have e-Governance project experience
2.	Integrated Command and Control Centre (ICCC) Expert	a) Bachelor's Degree in Engineering/Instrumentation and Control b) Experience : Minimum 10 years of IT experience c) Should have experience in Control and Command Centre implementation for minimum 2 projects d) Should preferably have e-Governance project experience
3.	Solution Architect	a) Education: MCA/M. Tech/B. Tech/B.E. from a recognized educational institution b) Experience: Minimum10 years in IT sector. c) Should have experience of more than 3 years as a Solution Architecture in large projects of similar nature d) Should preferably have e-Governance project experience

4.	Integrated Traffic Management Expert	a) BE/B.Tech or Graduation/Post Graduation in Transportation b) Experience: Minimum10 years of IT experience. c) Should have experience in designing & implementing Integrated Traffic Management system for minimum 2 projects. d) Should preferably have e-Governance project experience
5.	Security & Surveillance Expert	a) B.Tech / M.Tech/Post Graduate from a recognized educational institution b) Experience: Minimum10 years of IT experience. c) Should have experience in designing & implementation of CCTV projects in minimum 2 projects. d) Should preferably have e-Governance project experience
6.	GIS Expert	a) Bachelor Degree in Engineering/ Geology/MCA b) Experience: Minimum10 years of IT experience. c) Should have experience in designing & implementation of GIS mapping for minimum 2 projects d) Should preferably have e-Governance project experience
7.	Network & Security Infrastructure Expert	a) B.Tech / M.Tech/MBA/MCA from a recognized educational institution b) Experience: Minimum 10 years of IT experience c) Should have experience in designing the Network and Security structure for minimum 2 projects d) Should preferably have e-Governance project experience
8.	Server & Storage Expert	a) Bachelor's Degree in Engineering/ Architect b) Experience : Minimum 10 years of IT experience c) Should have experience as server and storage expert for minimum 2 projects d) Should preferably have e-Governance project experience

Notes:

- **The top three profile (Project Manager, Control and Command Centre Expert and Solution Architect) should be on the payroll of the sole bidder or the consortium partner**

Manpower plan for Implementation Phase to be provided as per format provided in 7.5.3 (I)

Apart from the above –mentioned resources, the Bidder shall also propose manpower to be deployed during the Operation & Maintenance phase of the Project as provided in the format 7.5.3 (II)

Any additional or support manpower shall be estimated and should be accounted for in the Commercial proposal by the selected bidder, so that, the project as per the scope defined and agreement are fulfilled and the project objectives are met.

3.6.4 Manpower Deployment

MSI shall deploy Manpower during implementation and O&M phases. The deployed resource shall report to ASCL Project In-charge for Smart City Project and work closely with Program Management Office of the project. Following are the minimum resources required to be deployed in the Project (Price should be quoted accordingly in commercial bid format), however SI may deploy additional resources based on the need of the Project and to meet the defined SLAs in this RFP:

#	Type of Resource	Quantity	Minimum Deployment during Implementation phase	Minimum Deployment during Operation and Maintenance phase
1	Project Manager	1	Atleast 80%	100%
2	ICCC Expert	1	Atleast 80%	Onsite Support to Project team on need basis
3	Integrated Traffic Management Expert	1	Atleast 80%	100%
4	Security & Surveillance Expert	1	Atleast 80%	100%
5	GIS Expert	1	Atleast 80%	100%
6	Solution Architect	1	Atleast 80%	Onsite Support to Project team on need basis
7	Network & Security – Infrastructure Expert	1	Atleast 60%	100%
8	Server & Storage Expert	1	Atleast 60%	100%

4. Award of Contract

4.1 Notification of Award

Authority will notify the successful Bidder in writing / e-mail to be confirmed by the Bidder in writing / email.

4.2 Signing of Contract

After the notification of award, Authority will issue Letter of Intent (LOI) followed by Work Order (WO). Accordingly, a contract shall be signed between successful bidder and Authority or the agency designated by Authority. As an acceptance of the LOI and WO, the Bidder shall sign and return back a duplicate copy of the Letter of Intent and the Work Order to the Authority or the agency designated by the Authority. The bidder shall return the duplicate copy along with a Performance Bank Guarantee within 15 working days from the date of issuance of PO/LOI.

On receipt of the Performance Bank Guarantee, Authority or the agency designated by Authority shall enter into a contract with the successful bidder. The Service Level Agreement (SLA) is provided in RFP Volume III. The contract shall include all the Terms and Conditions of the RFP, Corrigendum issued thereof if any and SLA shall be finalized & signed between the Authority and the Successful bidder within 30 working days from the date of issue of Work Order.

4.3 Performance Bank Guarantee (PBG)

The successful Bidder shall at his own expense submit unconditional and irrevocable Performance Bank Guarantee (PBG) to the Authority. The PBG shall be from a Nationalized Bank or a Scheduled Bank in the format prescribed in Section 9 - Annexure 5 (a), payable on demand at any of the bank branches in Agartala, for the due performance and fulfilment of the contract by the bidder.

This Performance Bank Guarantee shall be for an amount equivalent to 10% of total financial bid value (as per the financial bid format of the RFP)

PBG shall be invoked by Authority, in the event the Bidder:

a. Fails to meet the overall penalty condition as mentioned in RFP or any changes agreed between the parties,

b. Fails to perform the responsibilities and obligations as set out in the RFP to the complete satisfaction of Authority,

c. Misrepresents facts/information submitted to Authority.

The performance bank guarantee shall be discharged/returned by Authority upon being satisfied that there has been due performance of the obligations of the bidder under the contract. However, no interest shall be payable on the performance bank guarantee.

In the event of the Bidder being unable to service the contract for whatever reason(s), Authority shall have the right to invoke the PBG. Notwithstanding and without prejudice to any rights whatsoever

of Authority under the contract in the matter, the proceeds of the PBG shall be payable to Authority as compensation for any loss resulting from the bidder's failure to perform/comply its obligations under the contract.

In case the project is delayed beyond the project schedule as mentioned in RFP Vol II and all such delays accepted by the Authority, the implementation performance bank guarantee (IPBG) shall be accordingly extended by the Bidder till completion of scope of work as mentioned in RFP Volume II.

On satisfactory performance and completion of the order in all respects and duly certified to this effect by the Authority, Contract Completion Certificate shall be issued and the IPBG would be returned to the Bidder after the receipt of OPBG and after deducting the penal amount, if any, upon Go-Live. OPBG would be returned to the bidder upon completion of O&M of the project in all respect at the end of 5 years plus 60 days after deducting penalties, if any.

4.4 Warranty & Maintenance

Bidder shall also provide complete maintenance support, comprehensive on-site warranty, for all the proposed integrated solution as outlined in this RFP for a period of Sixty months from the date of go-live i.e. "Go-Live" + 60 months. "Go-live" is the date on which the proposed solution is completely operational as per the requirements provided in this RFP and all the acceptance tests are successfully concluded to the satisfaction of Authority.

The Bidder shall offer default warranty of Five years (5) for all the supplied IT equipment. & shall extend comprehensive Annual Maintenance Contract (AMC) services for five (5) years for all the equipment/ infrastructure supplied.

During the warranty period, the bidder shall warrant that the goods supplied under the contract are new, defect free, unused at the time of delivery, and of the most recent version/models and incorporate all recent improvements in design and materials unless provided otherwise in the contract. The bidder further warrants that the goods supplied under this contract shall have no defects arising from design, materials or workmanship.

Authority or designated representatives of the bidder shall promptly notify Successful Bidder in writing of any claims arising under this warranty and AMC. Upon receipt of such notice, the Bidder shall, within the warranty and AMC period and with all reasonable speed, repair or replace the defective systems, without costs to Authority and within time specified and acceptable to Authority. Bidder shall extend the services of repair, replacement and preventive maintenance for entire contract period of 5 years from the date of Go-Live without costs to Authority meeting SLA.

If the Successful Bidder, having been notified, fails to remedy the defect(s) within the period specified in the contract, Authority may proceed to take such reasonable remedial action as may be necessary, at the Successful Bidder's risk and expense and without prejudice to any other rights, which Authority may have against the Bidder under the Contract. Provided however that the Authority shall first give a prior reasonable notice to the Successful Bidder to rectify the default and only if the default

continues even after the expiry of the cure period shall the Authority have the right to invoke this penalty clause as mentioned in RFP Vol III.

During the warranty and comprehensive AMC period, the successful bidder shall provide all product(s) and documentation updates, patches/fixes, and version upgrades within 15 days of their availability and should carry out installation and make operational the same at no additional cost to Authority meeting SLA.

The successful bidder hereby warrants Authority that:

i. The implemented integrated solution represents a complete, integrated solution meeting all the requirements as outlined in the RFP and further amendments if any and provides the functionality and performance, as per the terms and conditions specified in the contract.

ii. The proposed integrated solution shall achieve parameters delineated in the technical specification/requirement.

iii. The successful bidder shall be responsible for warranty services from licensers of products included in the systems.

iv. The successful bidder undertakes to ensure the maintenance of the acceptance criterion/standards in respect of the systems during the warranty and comprehensive AMC period.

4.5 Failure to agree with the Terms & Conditions of the RFP

Failure of the successful bidder to agree with the Terms & Conditions of the RFP shall constitute sufficient grounds for the annulment of the award, in which event Authority may award the contract to the next best value bidder or call for new bids at the risk and cost of the successful bidder.

In such a case, Authority shall also invoke the PBG and/or forfeit the EMD.

5. Annexure 1 – Template for Pre-Bid Queries

Bidder shall submit all pre-bid queries in excel (soft copy) in the following format.

Request for clarification				
Sl. No.	**RFP Volume, Section**	**RFP Page No**	**Content of the RFP requiring clarification**	**Clarification Sought**

6. Annexure 2 – Formats for Submission of the Pre-Qualification Bid

6.1 Pre-qualification bid checklist

#	Eligibility Criteria	Document Proof	Compliance (Y/N)	Doc Ref
1	The Sole Bidder OR Lead Bidder (in case of consortium) should be: Could be an Indian or International Firm Registered under the Companies Act 1956/2013 Or any equivalent foreign act In operation in India or abroad for a period of at least 5 years as on date of bid submission **Consortium Members** Max 3 companies are allowed in a consortium including Lead Bidder Could be an Indian/ International firm Should have registered in India under Companies Act 1956/2013 or any equivalent foreign act Note: **For an International Bidder, Bidder (including Consortium Member) will have to register as company under companies Act, 1956/2013 within 6 months of issuing LOI.**	**For Sole/Lead Bidder** Copy of Certificate of Incorporation / Registration under Companies Act 1956/2013 or any equivalent foreign act Memorandum and Articles of Association GST Registration Certificate Copy of purchase orders showing at least 5 years of operations or Certified true copy of relevant extracts of balance sheet and PL statements for last 5 years **For Consortium members other than lead bidder** Copy of Certificate of Incorporation / Registration under Companies Act, 1956/2013 or any equivalent foreign act GST Registration Certificate Consortium agreement clearly stating the roles and responsibilities of each member **For an International firm** Bidder (including consortium member), an		**PQ_1**

#	Eligibility Criteria	Document Proof	Compliance (Y/N)	Doc Ref
		undertaking for registration of company under companies Act, 1956/2013 within 6 months of Issuing LOI		
2	The Bidder/ Consortium shall have an average annual turnover or INR 500 Crores over the last three (3) financial years. In case of consortium Lead Bidder should have minimum 60% of Turnover All members together should meet 500 Cr Turnover requirement Lead members or consortium members shall be into one of the following specific business areas Specific Business Areas ICT Infrastructure Telecom Infrastructure IT system integration services	The Sole Bidder or the Lead Bidder and all other members of consortium: • Audited statement for last 3 financial years of sole bidder • Audited statement for last 3 financial years of lead bidder & member companies • Certificate from the Statutory Auditor on turnover details from the "specific business areas" over the last 3 financial years		**PQ_2**
3	The sole bidder or the consortium should have a positive net worth for the previous 3 financial years from the date of NIT	• Audited and Certified Balance Sheet and Profit/Loss Account of last 3 Financial Years should be enclosed • Certificate from the Statutory auditor/ CA clearly specifying the net worth of the firm		**PQ_3**
4	The bidder (or any Consortium member) shall be a licensed ISP in India and should have awarded and successfully executed at least two (2) project related to setting up of City Wide/ Campus Wide Wi-Fi project	Documentary evidence (Copy of completion/ Ongoing client certificate and Work Order/ Contract) Note: Details on the supporting document is provided at section 3.5		**PQ_4**

#	Eligibility Criteria	Document Proof	Compliance (Y/N)	Doc Ref
	consisting of over 25 Access Points per projects during last seven (7) years			
5	The bidder (or any Consortium member) should have been awarded and successfully executed at least two (2) projects related to Integrated Traffic Management System integrating at least three (3) different components from the below list on a single application having a minimum value of INR 7 crores per project in the last seven (7) years Controlling Traffic Signals with centralized software system Red Light Violation Detection System Installation of Variable Message Signboards (VMS) Public Address System/ Emergency Call Box	Documentary evidence (Copy of completion/ Ongoing client certificate and Work Order/ Contract) Note: Details on the supporting document is provided at section 3.5		**PQ_5**
6	The bidder (or any Consortium member) should have been awarded and successfully executed at least two (2) projects related to Integrated Transit Management System/ Automatic Vehicle Tracking System implementing components mentioned in the list below having a minimum value of 5 crore per projects in the last seven (7) years: Automatic Vehicle Location System for at least 200 buses	Documentary evidence (Copy of completion/ Ongoing client certificate and Work Order/ Contract) Note: Details on the supporting document is provided at section 3.5		**PQ_6**

#	Eligibility Criteria	Document Proof	Compliance (Y/N)	Doc Ref
	(including AVL software, Hardware, etc.) Passenger Information System at 100 locations (Integrated with AVL to provide route & ETA to commuters)			
7	The bidder (or any Consortium member) should have awarded and successfully executed at least two (2) projects related to implementation of following scope in last seven (7) years Surveillance system like CCTV surveillance system or ANPR. Each project should have at least 200 cameras.	Documentary evidence (Copy of completion/ Ongoing client certificate and Work Order/ Contract) Note: Details on the supporting document is provided at section 3.5		**PQ_7**
8	The bidder (or any Consortium member) should have been awarded and successfully executed at least two (2) projects related to implementation of Outside Plant Fibre Optic Passive Infrastructure of at least 100 km or Active infrastructure with at least 50 nodes per project having a minimum value of INR 5 crores per project during last seven (7) years.	• Documentary evidence (Copy of completion/ Ongoing client certificate and Work Order/ Contract) Note: Details on the supporting document is provided at section 3.5		**PQ_8**
9	The bidder (or any Consortium member) should have demonstrable expertise and experience of setting up or O&M of Datacentre Equipment/ Integrated command and control room /emergency response centre / Security and Surveillance	• Documentary evidence (Copy of completion/ Ongoing client certificate and Work Order/ Contract) Note: Details on the supporting document is provided at section 3.5		**PQ_9**

#	Eligibility Criteria	Document Proof	Compliance (Y/N)	Doc Ref
	control room/ City wide (NOC/SOC)/Surveillance control room built for City operations/Highways, Railway, Airport Manufacturing Plants/ Private Firms/ Private Builders and other Government establishment during last Five years as on Bid Submission date of value not less than INR 10 Crore **Note:** In-house projects for their own corporation executed by the bidder shall not be considered for above purpose **Note:** In case bidder/prime bidder is a wholly owned subsidiary, the experience of parent company would be considered for eligibility			
10	The sole bidder OR the Lead bidder and each of the member of the Consortium should not be blacklisted by any Central / State Government Department or Central/State Public Sector Units (PSUs) in India as on the bid submission date	Undertaking by the authorized signatory of bidder (In case of Consortium to be provided by each member) as per format given in Annexure 2, section 6.4		**PQ_10**
11	Sole Bidder/ Lead Bidder should establish project office within 45 days of issuance of LoI in Agartala if not established earlier	Undertaking to open office in Agartala Or Copies of any two of the followings: Property Tax / Electricity / Telephone Bill / VAT/ CST Registration /Lease agreement.		**PQ_11**

6.2 Pre-Qualification Bid Covering Letter

<To be submitted on Lead Bidder's letterhead>

Date: dd/ mm / yyyy

To,

The CEO
Agartala Smart City Limited

Sub: **RFP for selection of Master System Integrator for Implementation of Integrated Command and Control Centre and Smart Elements in Agartala City**

Ref: RFP No. **<<.....>> dated << .....>>**

Dear Sir,

With reference to your "**RFP for selection of Master System Integrator for Implementation of Integrated Command and Control Centre and Smart Elements in Agartala City"**, we hereby submit our Prequalification bid, Technical Bid and have uploaded Commercials in eProcurement Portal for the same.

We hereby declare that:

a. We hereby acknowledge and unconditionally accept that the Authority can at its absolute discretion apply whatever criteria it deems appropriate, not just limiting to those criteria set out in the RFP and related documents, in short listing of Agency for providing services.

b. We have submitted EMD of Indian Rupees [ ] and Tender fee of Indian Rupees [ ]

c. We hereby declare that all information and details furnished by us in the Bid are true and correct, and all documents accompanying such application are true copies of their respective originals.

d. We agree to abide by our offer for a period of 180 days from the last date of submission of bid prescribed by **Authority** and that we shall remain bound by a communication of acceptance within that time.

e. We have carefully read and understood the terms and conditions of the RFP and the conditions of the contract applicable to the RFP. We do hereby undertake to provision as per these terms and conditions.

f. In the event of acceptance of our bid, we do hereby undertake:

   i. To supply the products and commence services as stipulated in the RFP document

   ii. To undertake the project services for entire contract period from the date of signing of the contract as mentioned in the RFP document.

   iii. We affirm that the prices quoted are inclusive of design, development, delivery, installation, commissioning, training, providing facility management and handholding support, and exclusive of all out of pocket expenses, taxes, levies discounts etc.

g. We do hereby undertake, that, until a formal contract is prepared and executed, this bid, together with your written acceptance thereof and notification of award of contract, shall constitute a binding contract between us.

h. We understand that the **Authority** may cancel the bidding process at any time and that **Authority** is not bound to accept any bid that it may receive without incurring any liability towards the bidder.

i. We fully understand and agree to comply that on verification, if any of the information provided in our bid is found to be misleading the selection process, we are liable to be dismissed from the selection process or termination of the contract during the project, if selected to do so

In case of any clarifications please contact _____ email at _____

Thanking you,

Yours sincerely,

(Signature of the Lead bidder)

Printed Name

Designation

Seal

Date:

Place:

Business Address:

6.3 Company profile

A. Brief company profile (required for both bidder and consortium member)

Sl. No.	Particular	Description or Details
1.	Name of Bidder	
2.	Legal status of Bidder (company, Pvt. Ltd., LLP etc.)	
3.	Main business of the Bidder	
4.	Registered office address	
5.	Incorporation/Registration date and number	
6.	GST Registration Number	
7.	PAN details	
8.	Primary Contact Person (Name, Designation, address, mobile number, fax, email)	
9.	Secondary Contact Person (Name, Designation, address, mobile number, fax, email)	
10.	EMD details	
11.	Role in Consortium (if applicable)	Brief scope of work in the consortium

B. Certificate of Incorporation/Registration (required for both bidder and Consortium members)

C. Financial Turnover

The financial turnover of the company is provided as follows:

	2014-2015	2015-2016	2016-2017
Annual Turnover			

- Copy of audited financial statements or declaration from the appointed statutory auditor/CA to be provided as proof of the financial turnover
- Positive net worth, as on the last date of latest audited financial year. Copy of self-certified statutory auditor certificate/CA to be submitted along with the bid

D. Certifications

Provide copy of valid certification for ISO 9001, ISO 27001 and ISO 20000 certifications and CMMI Level 3 or above certification of the previous projects executed as required in Pre-Qualification criteria as on date of NIT.

6.4 Declaration of Non-Blacklisting

(To be submitted on company letter head)

Declaration for Lead Bidder:

Place

Date

To,

The CEO

Agartala Smart City Limited

Subject: Self Declaration of not been blacklisted in response to the **RFP for selection of Master System Integrator for implementation of Integrated Command and Control Centre and Smart Elements in Agartala City**

Ref: RFP No. **<<.....>> dated << .....>>**

Dear Sir,

We confirm that our company or firm, _____,is currently not blacklisted in any manner whatsoever by any of the State or UT or PSU and or Central Government in India on any ground including but not limited to indulgence in corrupt practice, fraudulent practice, coercive practice, undesirable practice or restrictive practice as on <*last date of bid submission*>.

(Signature of the Lead Bidder)

Printed Name

Designation

Seal

Date:

Place:

Business Address:

6.5 Declaration for Consortium Member:

(To be submitted on company letter head)

{Place}

{Date}

To,
The CEO
Agartala Smart City Limited

Subject: Self Declaration of not been blacklisted in response to the **RFP for selection of Master System Integrator for implementation of Integrated Command and Control Centre and Smart Elements in Agartala City**

Ref: RFP No. **<<.....>> dated << .....>>**

Dear Sir,

We confirm that our company or firm, _____,is currently not blacklisted in any manner whatsoever by any of the State or UT or PSU and or Central Government in India on any ground including but not limited to indulgence in corrupt practice, fraudulent practice, coercive practice, undesirable practice or restrictive practice as on <*last date of bid submission*>.

(Signature of the Consortium Member)

Printed Name

Designation

Seal Date:

Place: Business Address:

6.6 No Deviation Certificate

<To be submitted on Lead Bidder's letterhead>

This is to certify that our offer is exactly in line with your tender enquiry/RFP (including amendments) no. _____ dated _____. This is to expressly certify that our offer contains no deviation with respect to Authority requirements, Scope of Work, Functional Requirements Specification, Hardware Specification and Technical Requirements Specification.

(Authorized Signatory)

Signature:
Name:
Designation:
Address:

Seal:
Date:

6.7 Total Responsibility Certificate

<To be submitted on Lead Bidder's letterhead>

This is to certify that we undertake the total responsibility for the defect free operation of the proposed solutions as per the requirement of the RFP for the duration mentioned in all the volumes of the RFP.

(Authorized Signatory)

Signature:
Name:
Designation:
Address:

Seal:
Date:

6.8 Self-certificate for Project execution experience (In Bidding Entity's Letter Head)

This is to certify that <Name of the Bidding entity> has been awarded with < Name of the Project > as detailed under:

Name of the Project	
Client's name, Contact No. and Complete Address	
Contract value for the Bidder (in India n Rupees)	
Current status of the project (Completed/ Ongoing)	
Activities completed by bidding entity as on bid submission date (N.B only relevant activities as sought in the criteria to be included)	
Value of work completed for which payment has been received from the client	
Date of Start	
Date of Completion	

(Authorized Signatory)

Signature:
Name:
Designation:
Bidding entity's name
Address:

Seal:
Date:

7. Annexure 3 – Formats for Submission of the Technical Bid

7.1 Technical Bid Check-List

Sl #	Checklist Item	Compliance (Yes/No)	Page No. and Section No. in the Bid
1	Technical Bid Letter		
2	Credential summary		
3	Project Citations and Self-certifications, as applicable		
4	Detailed proposed solution		
5	Project plan and manpower plan		
6	Proposed CVs		
7	Compliance to Requirement (Technical / Functional Specifications)		
8	Proposed Bill of Material		
9	Manufacturers'/Producers' Authorization Form Anti-Collusion certificate		
10	Non-disclosure agreement		

7.2 Technical Bid Covering Letter

<To be submitted on Lead Bidder's letterhead> Date: dd/mm/yyyy

To,
The CEO
Agartala Smart City Limited

Subject: **RFP for selection of Master System Integrator for implementation of Integrated Command and Control Centre and Smart Elements in Agartala City**

Ref: RFP No. **<<.....>> dated << .....>>**

Dear Sir,

I (in case of single bidder) or We, <<name of the undersigned Bidder and consortium members>>, having read and examined in detail all the bidding documents in respect of "**RFP for selection of Master System Integrator for implementation of Integrated Command and Control Centre and Smart Elements in Agartala City"** do hereby propose to provide our services as specified in the bid submitted by us.

It is hereby confirmed that I / We are entitled to act on behalf of our company / corporation / firm / organization and empowered to sign this document as well as such other documents, which may be required in this connection.

We declare that all the services shall be performed strictly in accordance with the RFP documents.

We confirm that the information contained in this response or any part thereof, including its exhibits, and other documents and instruments delivered or to be delivered to Authority, is true, accurate, verifiable and complete. This response includes all information necessary to ensure that the statements therein do not in whole or in part mislead the department in its evaluation process. We also confirm that we shall not attract conflict of interest in principle.

We hereby declare that in case the contract is awarded to us, we shall submit the contract Performance bank guarantee in the form prescribed at Annexure 5 (a) of Section 9 of the RFP Volume I.

We hereby declare that our bid is made in good faith, without collusion or fraud and the information contained in the bid is true and correct to the best of our knowledge and belief.

We understand that our bid is binding on us and that you are not bound to accept a Bid you receive. This bid is valid for 180 days from the last date of submission of bid. We shall extend the validity of the bid if required by Authority.

Thanking you,
Yours sincerely,
(Signature of the Lead Bidder)
Printed Name
Designation
Seal
Date:
Place:
Business Address:

7.3 Credential Summary

S. No.	Project Name	Client Name	Client Type	Project Value (In INR)	Documentary evidence provided (Yes or No)	Project Status (Completed or Ongoing or Withheld)
1.						
2.						
3.						
4.						
5.						

- Client type – Indicate whether the client is Government or PSU or Private
- Project Components – Indicate the major project components like setting up of IT systems/ IT systems integration/ IT services/ ICT/ System integration services/ communication infrastructure/ city surveillance/ ICT based utility management/ Transport management/ command & control center implementation/ Network operating center (NOC)
- Documentary evidence provided – Indicate the documentary evidence provided with the detailed project credential like work order or purchase order or completion certificate or letter of appointment
- Project Status – Completed (date of project completion) or Ongoing (project start date)

7.4 Bidder's Experience - Client Citations

Sole Bidder or Lead bidder in case of Consortium is requested to furnish the credentials in the following format for both Pre-Qualification and Technical Criteria. All credentials should be followed by relevant documentary proof.

Name of the Project & Location	
Client's name, Contact No. and Complete Address	
Contract value for the Bidder (in India n Rupees)	
Narrative description of project:	
Date of Start	
Date of Completion	
Activities undertaken by prime bidder or consortium member	

Note: If the project is ongoing, bidder must clearly specify which of the stages/phases/milestones are completed and which are ongoing and at what stage of completion and produce a self-certificate as per the format provided in Section 6.8.

7.5 Overview of Proposed Solution

7.5.1 Structure of Proposed Solution

Bidders are required to provide a detailed Approach & Methodology as part of their technical proposal along with presentation covering the following to execute the entire project. Bidders are advised to comply with the below provided headers/Approach components while detailing out their solution.

Sl. No	Item
1	Understanding of the project and Conformity to Volume 2 functional requirement
2	Detailed Architecture plan encompassing all ICT elements proposed in Volume 2
3	Completeness of project plan and ease of implementation (including training and change management plan)
4	Method of integration proposed with other IT initiative
5	Identification of major risks for the projects and suitable mitigation plan proposed for each of these risks
6	Strategy to maintain all the SLAs and handling change requests
7	Detailed Business Plan highlighting Revenue Streams for relevant smart elements
8	What will be the approach towards the scalability, interoperability and modularity features considering the future expansion of the projects? (The response to this question shall be given considering growth of Smart Cities as well as new applications or systems that may be envisaged/developed in future)
9	Approach towards testing and quality
10	How SLAs mentioned under this RFP will be measured? What tools will be used for SLA measurement?
11	Proposed solution ensures the fool proof security to the system from various threats including hacking attempts, internal threats, etc. Please explain in detail approach towards the security of the overall solution from external and internal threats
12	What are the key learning from the similar projects and how do you propose to incorporate them in executing this assignment.
13	Assessment of Manpower deployment, Training and Handholding plan • Deployment strategy ofManpower • Contingency management • Mobilization of existing resources and additional resources as required • Training and handholdingstrategy

Note: The same shall cover all the points mentioned in 3.6.1.C

7.5.2 Project Plan

A **Detailed Project Plan** covering break-up of each phase into the key activities, along with the start and end dates must be provided as per format given below.

Activities Wise Timeline							
S. No.	Detailed work breakdown structure	Month Wise Program					
		1	2	3	4	5	……
	Project Plan						
1	Activity 1						
1.1	Sub-Activity 1						
1.2	Sub-Activity 2						

7.5.3 Manpower Plan

I. Till Go-Live Implementation

Activities Wise Timeline									
S. No.	Role	Month wise time to be spent by each personnel (in days)						Total	
		1	2	3	4	5	……		
1.	Project Manager								Onsite
2.	ICCC Expert								Onsite
3.	Solution Architect								Onsite
4.	Integrated Traffic Management System								Onsite
5.	Security & Surveillance Expert								Onsite
6.	GIS Expert								Onsite
7.	Network & Security Infrastructure Expert								Onsite
8.	Server & Storage Expert								Onsite

II. After Go-Live implementation (Operation & Maintenance)

Activities Wise Timeline									
S. No.	Man Power detailed breakup	Month wise time to be spent by each personnel (in days)						Total	
		Year 1	Year 2	Year 3	Year 4	Year 5	……		
1									Onsite/Offsite
2									Onsite/Offsite
3									Onsite/Offsite
4									Onsite/Offsite
5									Onsite/Offsite
6									Onsite/Offsite
7									Onsite/Offsite
8									Onsite/Offsite
9									Onsite/Offsite

7.6 Details of Resources proposed

7.6.1 Summary of Resources proposed

Sl. No.	Name of the resource	Proposed Role	Highest Degree	Basic Qualification (e.g., B.Sc. or BE or MCA or Post Graduation)	Certifications (e.g., PMP or ITIL or TOGAF or CCNP etc.)	Total Experience (In Years)
1.						
2.						
3.						
4.						
5.						
6.						
7.						
8.						
9.						
10.						

7.7 Curriculum Vitae (CV) of Team Members

<table>
<tr><td>1.</td><td>Proposed Position:</td><td colspan="4"></td></tr>
<tr><td>2.</td><td>Name of firm</td><td colspan="4"></td></tr>
<tr><td>3.</td><td>Name of the staff</td><td colspan="4"></td></tr>
<tr><td>4.</td><td>Date of Birth</td><td colspan="4"></td></tr>
<tr><td>5.</td><td>Nationality</td><td colspan="4"></td></tr>
<tr><td>6.</td><td>Education</td><td colspan="4"><table><tr><td>Qualification</td><td>Institute/University</td><td>Degree Obtained</td><td>Year of passing</td></tr><tr><td></td><td></td><td></td><td></td></tr></table></td></tr>
<tr><td>7.</td><td>Membership of Professional Associations:</td><td colspan="4"></td></tr>
<tr><td>8.</td><td>Certifications and Trainings attended</td><td colspan="4"></td></tr>
<tr><td>9.</td><td>Countries of work experience</td><td colspan="4"></td></tr>
<tr><td>10.</td><td>Languages</td><td colspan="4">For each language indicate proficiency: good, fair, or poor in speaking, reading, and writing</td></tr>
<tr><td>11.</td><td>Employment Record</td><td colspan="4"><table><tr><td>Employer</td><td>Position</td><td>From</td><td>To</td></tr><tr><td></td><td></td><td></td><td></td></tr></table></td></tr>
<tr><td>12.</td><td>Detailed Task Assigned</td><td colspan="4"></td></tr>
<tr><td>13.</td><td colspan="5">Relevant Work Undertaken that Best Illustrates the experience as required for the Role)</td></tr>
<tr><td>14.</td><td>Name of Assignment
Year
Location
Employer
Main Project Features
Position held
Activities Performed</td><td colspan="4"></td></tr>
</table>

7.8 Compliance to Requirement (Technical / Functional Specifications)

The bidder should provide compliance to the requirement specifications (both technical and functional) specified in the Annexures of the Volume II of this RFP. The same should be reproduced here, and compliance against each requirement line item should be marked. .

Note:

A no for full compliance for any items in above table is considered as non-responsive, bids will not be further evaluated and will be rejected.

7.9 Proposed Bill of Material

The Bidder should provide the proposed Bill of Material (BoM) here. Bidders are required to mention the details of the make/brand and model against each line item, wherever applicable. The bid can be considered non-responsive in the absence of any such details and the bids will be summarily rejected. Once the bidder provides this information in the submitted bid, the bidder cannot change it with any other component / equipment etc. of lower specifications / performance; it can only be upgraded at the time of actual deployment/installation. The Bidder shall quote only one specific make and model from only one specific OEM, for each of the goods. Providing more than one option shall not be allowed

***The list of items mentioned hereunder is indicative. The Bidder shall consider the components and quantity to fulfill the RFP and project requirements in totality. The BoM shall comply with the FRS and TRS given in Vol.2 of the RFP

7.9.1 Integrated Traffic Management System

No.	BoM Lime Item	Total Qty.	Modification Proposed	Make /Brand	Model Details	Full compliance with RFP
A	**Traffic Violation Detection System (RLVD system) at Traffic Junctions**					
A.1	TVDS system including ANPR Camera (4 arm, 1 lane each)	14 * 4 = 56				
A.2	TVDS system including ANPR Camera (3 arm, 1 lane each)	7 * 3 = 21				
A.3	TVDS system including ANPR Camera (2 arm, 1 lane each)	2 * 2 = 4				
A.4	IR Illuminator	81				
A.5	Wide angle evidence camera	81				
A.6	Pole Mounted Control Unit : including AC Power supply and UPS, CPU Sub Module, with all cabling, fittings, earthing , etc.	81				
A.7	RLVD Field Processing Unit	81				
A.8	6 Mtr Cantilever Pole as per site requirement	81				
A.9	Complete cabling and civil works as required	Lumpsum				
B	**Smart Traffic Signal (Signalization)**					

No.	BoM Lime Item	Total Qty.	Modification Proposed	Make /Brand	Model Details	Full compliance with RFP
B.1	Signalization (2 arm junctions)	2				
B.2	Signalization (3 arm junctions)	7				
B.3	Signalization (4 arm junctions)	14				
B.4	**Pole Mounted Control Unit :** including AC Power supply and UPS, CPU Sub Module, with all cabling, fittings, earthing , etc	23				
B.5	Complete cabling and civil works as required	Lumpsum				
C	**Electronic Challan System**					
C.1	E-Challan Hand held devices with E-Challan s/w for Handheld	350				
D	**Addition Requirement**					
D.1	Any other Hardware or Software required to meet the RFP requirements (Bidder to list individual items and provide costing).	Lumpsum				

7.9.2 Transit Management System (AVLS & PIS)

No.	BoM Lime Item	Total Qty.	Modification Proposed	Make /Brand	Model Details	Full compliance with RFP
A	**Vehicle Tracking System (AVLS)**					
A.1	GPS/OBU for TRTC Buses	173				
A.2	**GPS/OBU for Emergency Vehicles**					
A.2.1	Government Ambulances	7				
A.3	**GPS/OBU for IPT**					
A.3.1	Autorickshaw	8000				
A.4	4G (or above) enabled SIM Cards	8180				
B	**Electronic Ticketing**					

No.	BoM Lime Item	Total Qty.	Modification Proposed	Make /Brand	Model Details	Full compliance with RFP
B.1	Handheld ticketing machine with common payment system requirement and inclusive of all related accessories, software to meet the requirement	350				
B.2	4G (or above) enabled SIM Cards	350				
C	**Smart Bus Shelter/ Depots**					
C.1	19" size of PIS display at Bus Shelters/stops + UPS	45				
C.2	55" size of PIS display at Bus Depots + UPS	3				
C.3	Fixed Box Camera	45				
C.4	ECB/ Panic Button	45				
C.5	VMD board (at Bus Shelters including VMS controller) size 960mm*960mm*200 mm (minimum) with complete hardware and accessories as required including UPS facility as per specifications	45				
C.6	VMS board including (at Bus Depots VMS controller size) 3000mm*1500mm*200 mm (minimum) with complete hardware and accessories as required + Mounting structure for VMS including UPS facility as per specifications	3				
C.7	4G (or above) enabled SIM Cards	100				
D	**Addition Requirement**					
D.1	Any other Hardware or Software required to meet the RFP requirements (Bidder to list individual items and provide costing).	Lump sum				

7.9.3 Variable Message Display

No.	BoM Lime Item	Total Qty.	Modification Proposed	Make /Brand	Model Details	Full compliance with RFP
A	**Variable Message Displays (VMDs) at different location in the city**					
A.1	VMD board including VMS controller size 960mm*960mm*200 mm (minimum) with complete hardware and accessories as required + Mounting Structure including UPS facility as per specifications	11				
A.2	VMS board including VMS controller size 3000mm*1500mm*200 mm (minimum) with complete hardware and accessories as required + Mounting structure for VMS including UPS facility as per specifications	12				
A.3	4G (or above) enabled SIM Cards	23				
B	**Additional Requirement**					
B.1	Any other Hardware or Software required to meet the RFP requirements (Bidder to list individual items and provide costing).	Lumpsum				

7.9.4 City Surveillance System

No.	BoM Lime Item	Total Qty.	Modification Proposed	Make /Brand	Model Details	Full compliance with RFP
A	**CCTV Camera at different location in the city**					
A.1	Outdoor Box Camera	442				
A.2	Outdoor PTZ Camera	22				
A.3	IR Illuminator (for Outdoor Box Camera)	442				

No.	BoM Lime Item	Total Qty.	Modification Proposed	Make /Brand	Model Details	Full compliance with RFP
A.4	Poles for Cameras and Equipment	131				
A.5	Industrial grade outdoor PoE switches	131				
A.6	Provision for Electrical Power	131				
A.7	Networking Cost (Passive Component : Junction Box, Patch Panel/LIU, OFC, Cat6 Cable, Patch Cords, Pipes, Earthing, Lighting arrester and electrical, earthing cables).	131				
A.8	UPS with Battery (appropriate Backup per technical specification and SLA mentioned in volume II of this RFP).	131				
A.9	Digging, Piping & Re-filling, including digging for electrical cabling	Lumpsum				
B	**Emergency Call Box**					
B.1	Emergency Call Box	18				
C	**Public Address System**					
C.1	Public Address System	18				
D	**Additional Requirement**					
D.1	Any other Hardware or Software required to meet the RFP requirements (Bidder to list individual items and provide costing).	Lumpsum				

7.9.5 Automatic Number Plate Recognition System

No.	BoM Lime Item	Total Qty.	Modification Proposed	Make /Brand	Model Details	Full compliance with RFP
A	**Automatic Number Plate Recognition (ANPR) system for 43 locations in city**					
A.1	ANPR Camera	43				
A.2	IR Illuminator	43				

No.	BoM Lime Item	Total Qty.	Modification Proposed	Make /Brand	Model Details	Full compliance with RFP
A.3	Wide angle evidence camera	43				
A.4	Pole Mounted Control Unit : including AC Power supply and UPS, CPU Sub Module, with all cabling, fittings, earthing , etc.	12				
A.5	6 Mtr Cantilever Pole as per site requirement	12				
A.6	Complete cabling and civil works as required	Lumpsum				
B	**Additional Requirement**					
B.1	Any other Hardware or Software required to meet the RFP requirements (Bidder to list individual items and provide costing).	Lumpsum				

7.9.6 Intelligent Pole

No.	BoM Lime Item	Total Qty.	Modification Proposed	Make /Brand	Model Details	Full compliance with RFP
A	**Intelligent Pole with all components at 6 locations in the city**					
A.1	**Smart Poles** with following minimum components along with their complete associated accessories as required: a. Intelligent Pole b. LED based Smart Street Light (LED Luminaire, LED Luminaire Controller) c. Public Wi-Fi (WLAN Controller, Access Point) d. Surveillance Cameras e. VMS f. Environmental Sensors g. UPS for battery backup	6				
B	**Additional Requirement**					

No.	BoM Lime Item	Total Qty.	Modification Proposed	Make /Brand	Model Details	Full compliance with RFP
B.1	Any other Hardware or Software required to meet the RFP requirements (Bidder to list individual items and provide costing).	Lumpsum				

7.9.7 City Wide Wi-Fi

No.	BoM Lime Item	Total Qty.	Modification Proposed	Make /Brand	Model Details	Full compliance with RFP
A	**Wi-Fi System at 23 locations in the city**					
A.1	Wi-Fi Access Point with controller	23				
B	**Additional Requirement**					
B.1	Any other Hardware or Software required to meet the RFP requirements (Bidder to list individual items and provide costing).	Lumpsum				

7.9.8 Digital Information Kiosk

No.	BoM Lime Item	Total Qty.	Modification Proposed	Make /Brand	Model Details	Full compliance with RFP
A	**Digital Information Kiosk at different locations in the city**					
A.1	Multi Utility Digital Information Kiosk	26				
B	**Additional Requirement**					
B.1	Any other Hardware or Software required to meet the RFP requirements (Bidder to list individual items and provide costing).	Lumpsum				

7.9.9 Optical Fibre Cable

No.	BoM Lime Item	Total Qty.	Modification Proposed	Make /Brand	Model Details	Full compliance with RFP
A	**Optical Fibre Cable Laying**					
A.1	48 core (or above) optical fibre cable	102 KM				
A.2	UTP Cat 6 Armoured Cable (As per Bidder's Solution)	102				
A.3	Patch Cord	300				
A.4	Switches	51				
A.5	HDPE for laying OFC (Per Km)	102 KM				
A.6	Network Switch (Junctions)	51				
A.7	Junction Box	51				
A.8	Field UPS	51				
A.9	Patch Panel/ Fibre interface unit	51				
B	**Addition Requirement**					
B.1	Any other Hardware or Software required to meet the RFP requirements (Bidder to list individual items and provide costing).	Lumpsum				

7.9.10 Command and Control Centre

No.	BoM Lime Item	Total Qty.	Modification Proposed	Make /Brand	Model Details	Full compliance with RFP
A	**Video Wall System**					
A.1	Video Wall Cubes (55") LED in 5x2 matrix	10				
A.2	Video Wall Controller with Wall Management System	1				
B	**Hardware for ICCC**					
B.1	Multi-Function Laser Printer (City Control Room)	2				

No.	BoM Lime Item	Total Qty.	Modification Proposed	Make /Brand	Model Details	Full compliance with RFP
B.2	Operator Workstations (City Control Room)	16				
B.3	IP Phones	25				
B.4	Digital Set top boxes	1				
B.5	Television Set (Meeting room)	2				
B.6	Office Desktop	5				
C	**Situation Room**					
C.1	55" LED display to present critical information Display	2				
C.2	Video Conferencing Unit	1				
D	**IP PBX System for ICCC**					
D.1	IP PABX System	1				
D.2	PRI Modem pair	2				
E	**Building Utilities for ICCC**					
E.1	DG Set (For IT load only)	1				
E.2	IBMS	1				
E.3	UPS with battery backup (as per technical specification in Vol 2 of RFP)	1				
E.4	Access Control System	1				
E.5	Electrical and Power cabling	1				
E.6	Electrical Cabling & Necessary illumination devices	1				
E.7	LAN and CAT-6 cabling	1				
E.8	Public Address System	1				
E.9	Fire & Smoke Detection System	3				
E.10	Fixed Dome Cameras with 32 channel NVR	6				
F	**Services for ICCC**					
F.1	DTH Subscription	1				
F.2	PRI Lines	1				

No.	BoM Lime Item	Total Qty.	Modification Proposed	Make /Brand	Model Details	Full compliance with RFP
G	**Furniture**					
G.1	Furniture for city operations room operator desk	15				
G.2	Furniture for city operations room manager's desk	1				
G.3	Furniture for city operations room meeting table and chairs	1				
G.4	Furniture for city meeting room meeting table and chairs	1				
G.5	Furniture for contact center operators desk	4				
G.6	Furniture for security room desk	2				
G.7	Furniture for help desk team	2				
G.8	Furniture for Technical Support Team Desk	8				
G.9	Furniture for war room	1				
H	**Network & Security**					
H.1	Switches/ Router	2				
H.2	Networking/ IT racks	2				
H.3	MPLS Router	2				
H.4	Core Switch/ Data Center switch	2				
I	**Contact Center Operators**					
I.1	Contact Center Operators	24				
J	**Civil Works**					
J.1	Civil Work (Structure of building shall be provided by the City SPV, finishing which includes wiring, ducting, false ceiling, false flooring, etc. will be the responsibility of MSI)	1				
K	**Additional Requirement**					

No.	BoM Lime Item	Total Qty.	Modification Proposed	Make /Brand	Model Details	Full compliance with RFP
K.1	Any other Hardware or Software required to meet the RFP requirements (Bidder to list individual items and provide costing).	Lumpsum				

7.9.11 Data Centre (To be hosted at State Data Center)

No.	BoM Lime Item	Total Qty.	Modification Proposed	Make /Brand	Model Details	Full compliance with RFP
A	**Servers**					
A.1	Integrated Traffic Management System	2				
A.2	ANPR	2				
A.3	RLVD	2				
A.4	Speed detection	2				
A.5	Automatic Vehicle Location System	2				
A.6	Electronic Ticketing	2				
A.7	Passenger Information System	2				
A.8	City Surveillance	2				
A.9	Electronic Call Box	2				
A.10	Variable Message Display	2				
A.11	Smart Pole	2				
A.12	Wi-Fi	2				
A.13	Digital Information Kiosk	2				
A.14	Fibre Management System	2				
A.15	Database Server	2				
A.16	E-Challan Server	2				
A.17	Server for CCC Application & other applications like IBMS, contact centre etc.	2				
B	**Application & System Software**					
B.1	ITMS Software	1				

No.	BoM Lime Item	Total Qty.	Modification Proposed	Make /Brand	Model Details	Full compliance with RFP
B.2	Intelligent Pole	1				
B.3	Fibre Management System					
B.4	ICCC Application	1				
B.5	Contact Centre application and database	1				
C	**Other Components**					
C.1	IT Rack (42 U)	1				
C.2	Storage (SAN Switch)	1				
C.3	Storage (500 TB)	1				
C.4	Network Video Recording (NVR) System	1				
C.5	Video Management System (VMS)	1				
C.6	Tape Library	1				
C.7	LAN Switches (along with desired software system like OS, DB, etc.)	1				
C.8	Aggregation Router (along with desired software system like OS, DB, etc.)	1				
C.9	Access Switch (along with desired software system like OS, DB, etc.)	1				
C.10	Internet Router (along with desired software system like OS, DB, etc.)	1				
C.11	KVM Switch (along with desired software system like OS, DB, etc.)	1				
C.12	Core Switch (along with desired software system like OS, DB, etc.)	1				
C.13	Aggregation Switch (along with desired software system like OS, DB, etc.)	1				
C.14	Application Load balancer	1				

No.	BoM Lime Item	Total Qty.	Modification Proposed	Make /Brand	Model Details	Full compliance with RFP
C.15	Server Load Balancer	1				
C.16	Link Load balancer	1				
C.17	Backup Software (per TB Capacity)	200				
C.18	Archival Software (per TB Capacity)	5				
D	**Additional Requirement**					
D.1	Any other Hardware or Software required to meet the RFP requirements (Bidder to list individual items and provide costing).	Lumpsum				

7.9.12 Disaster Recovery (Cloud DR)

No.	BoM Lime Item	Total Qty.	Modification Proposed	Make /Brand	Model Details	Full compliance with RFP
A	**Servers**					
A.1	Integrated Traffic Management System	1				
A.2	ANPR	1				
A.3	RLVD	1				
A.4	Speed detection	1				
A.5	Automatic Vehicle Location System	1				
A.6	Electronic Ticketing	1				
A.7	Passenger Information System	1				
A.8	City Surveillance	1				
A.9	Electronic Call Box	1				
A.10	Variable Message Display	1				
A.11	Smart Pole	1				
A.12	Wi-Fi	1				
A.13	Digital Information Kiosk	1				
A.14	Fibre Management System	1				
A.15	Database Server	1				

No.	BoM Lime Item	Total Qty.	Modification Proposed	Make /Brand	Model Details	Full compliance with RFP
A.16	E-Challan Server	1				
A.17	Server for CCC Application & other applications like IBMS, contact centre etc.	1				
B	**Other Components**					
B.1	IT Rack (42 U)	1				
B.2	Storage (SAN Switch)	1				
B.3	Storage (500 TB)	1				
B.4	Network Video Recording (NVR) System	1				
B.5	Video Management System (VMS)	1				
B.6	Tape Library	1				
B.7	LAN Switches (along with desired software system like OS, DB, etc.)	1				
B.8	Aggregation Router (along with desired software system like OS, DB, etc.)	1				
B.9	Access Switch (along with desired software system like OS, DB, etc.)	1				
B.10	Internet Router (along with desired software system like OS, DB, etc.)	1				
B.11	KVM Switch (along with desired software system like OS, DB, etc.)	1				
B.12	Core Switch (along with desired software system like OS, DB, etc.)	1				
B.13	Aggregation Switch (along with desired software system like OS, DB, etc.)	1				
B.14	Application Load balancer	1				
B.15	Server Load Balancer	1				

No.	BoM Lime Item	Total Qty.	Modification Proposed	Make /Brand	Model Details	Full compliance with RFP
B.16	Link Load balancer	1				
B.17	Backup Software (per TB Capacity)	200				
B.18	Archival Software (per TB Capacity)	5				
C	**Additional Requirement**					
C.1	Any other Hardware or Software required to meet the RFP requirements (Bidder to list individual items and provide costing).	Lumpsum				

7.9.13 One Time Service Integration at ICCC

No.	Lime Item	Quantity	Modification Proposed	Full compliance with RFP
1.	Integration of ICCC with Street Lighting	Lump Sum		
2.	Integration of ICCC with ITMS	Lump Sum		
3.	Integration of ICCC with Vehicle Tracking System	Lump Sum		
4.	Integration of ICCC with Digital Kiosk	Lump Sum		
5.	Integration of ICCC with City Surveillance System	Lump Sum		
6.	Integration of ICCC with PIS	Lump Sum		
7.	Integration of ICCC with GIS	Lump Sum		
8.	Integration of ICCC with e-Governance Applications & City Wide App	Lump Sum		
9.	Integration of ICCC with VMD	Lump Sum		
10.	Integration with Emergency Response and Disaster Mgmt.	Lump Sum		
11.	Integration with ECB/ PAS	Lump Sum		
12.	Integration with Wi-Fi system	Lump Sum		
13.	Integration of ICCC with ICT components at Poles	Lump Sum		

14.	Integration of ICCC with SWM Garbage Collector	Lump Sum		

7.9.14 Manpower Cost

#	BoM	Qty	Modification Proposed	Full compliance with RFP
1	Project Manager	1		
2	ICCC Expert	1		
3	Solution Architect	1		
4	Integrated Traffic Management Expert	1		
5	Security & Surveillance Expert	1		
6	GIS Expert	1		
7	Network & Security Infrastructure Expert	1		
8	Server & Storage Expert	1		

7.9.15 CCC Platform (DC Cloud)

No.	BoM Lime Item	Total Qty.	Modification Proposed	Make /Brand	Model Details	Full compliance with RFP
A	**City Common Platform**					
A.1	Initial set up per city- Implementation, configuration and activation of City Operation Platform	1				
A.2	City GIS platform	1				

7.10 Manufacturers'/Producers' Authorization Form

(This form has to be provided by the OEMs of the hardware and software solutions proposed. This letter of authority should be on the letterhead of the manufacturer and should be signed by a person competent and having the power of attorney to bind the manufacturer.)

Date:

To,

The CEO

Agartala Smart City Limited (ASCL)

Agartala, Tripura

Subject: Manufacturer's Authorization Form

Ref: RFP No. <<.....>> dated << .....>>

Dear Sir,

We_____ (Name of the OEM) who are established and reputable manufacturers of_____ (List of Goods) having factories or product development centers at the locations_____ or as per list attached, do hereby authorize. _____ (Name and address of the Bidder) to bid, negotiate and conclude the contract with you against RFP No._____Dated _____for the above goods manufactured or developed by us.

We hereby extend, our warranty for the hardware goods supplied by the bidder and or maintenance or support services for software products against this invitation for bid by_____ (Name of the Bidder) as per requirements and for the duration of contract as specified in this RFP.

We also confirm that our offered product will not be end of life for minimum of 5 years from the date of Go-Live and the support for such offered product/s will be available for minimum of 5 years from the date of Go-Live.

Thanking you,

Yours faithfully,

(Signature)

For and on behalf of: _____ (Name of the OEM)

Authorised Signatory

Name:

Designation:

Place:

Date:

7.11 Anti-Collusion Certificate

[Certificate should be provided by Lead Bidder and on letter head]

Anti-Collusion Certificate

We hereby certify and confirm that in the preparation and submission of our Bid for **RFP FOR SELECTION OF MASTER SYSTEM INTEGRATOR FOR IMPLEMENTATION OF INTEGRATED COMMAND AND CONTROL CENTRE IN AGARTALA CITY** against the RFP issued by Authority, We have not acted in concert or in collusion with any other Bidder or other person(s) and also not done any act, deed or thing, which is or could be regarded as anti-competitive. We further confirm that we have not offered nor will offer any illegal gratification in cash or kind to any person or organization in connection with the instant bid.

(Signature of the Lead Bidder)

Printed Name

Designation

Seal

Date:

Place:

Business Address:

7.12 Details of additional components mentioned as "Others" in the BoQ

The Bidder may provide the additional line items in the proposed Bill of Material (BoM), in addition to the line items mentioned in the financial format in this RFP. Bidders are required to mention the details of the make/brand and model against each line item, wherever applicable. The bid can be considered non-responsive in the absence of such details. Once the bidder provides this information in the submitted bid, the bidder cannot change it with any other component / equipment etc. of lower specifications / performance; it can only be upgraded at the time of actual deployment/ installation. The Bidder shall quote only one specific make and model from only one specific OEM, for each of the goods. Providing more than one option shall not be allowed.

7.12.1 Additional Bill of Quantity

Sl. No.	Description	UoM	Qty
1	Item 1		
2	Item 2		
3	Item 3		
4	Item 4		
5	Item 5		
6	Item 6		
	.		
	.		

Note:

The Bidder shall specify all additional line items proposed by him in the above specified format.

However, in the e-procurement portal, the total price for all additional items proposed shall be indicated in the last line items designated as "Others".

The successful bidder shall provide the price break-up for all such additional items proposed by him, before conclusion of contract agreement.

7.13 Tax Format

Bidders are required to provide the details of the applicable tax component considered against each line item and also for additional bill of quantity (as per Section 7.12), wherever applicable. The bid shall be considered non-responsive in the absence of these details. These details shall be used only for reference purpose and shall not be considered for the evaluation.

However, for evaluation purpose, total price, exclusive of taxes, shall be considered for identification of least bidder and according appointment of System Integrator. The taxes as per actual shall be paid by the Authority during the project period, upon submission of original invoice for line items and additional line items, as applicable.

An illustrative layout for providing details of applicable tax components is shown below. Bidders will have to provide applicable tax as per the line items mentioned in BoM in Section 7.9

7.13.1 Application 1 (Ex. ITMS, RTS, VMD ....)

No.	BoM Lime Item	GST TAX %
A	**Components 1**	
A.1		
A.2		
A.3		
B	**Component 2**	
B.1		
B.2		
B.3		
C	**Component 3**	
C.1		

8. Annexure 4 – Formats for Submission of the Commercial Bid

8.1 Total Price Summary

S. No.	Head	Amount (In Indian Rupees)	Amount (In Words)
1.	**Total Capex Price** (Exclusive of all taxes, levies, duties, etc. as applicable)		
2.	**Total Opex Price** (Exclusive of all taxes, levies, duties, etc. as applicable)		
3.	**Total Price (1 + 2)** (Exclusive of all taxes, levies, duties, etc. as applicable)		

a. Bidder should provide all prices as per the prescribed format under this Annexure. Bidder should not leave any field blank. In case the field is not applicable, Bidder must indicate "1" (One) in all such fields.

b. Bidder should quote his price for each of the line item

- Bidder should enter the Unit Rate, excluding tax, for that particular line item.

c. All the prices against each Line Items must be exclusive of any Taxes and are to be entered in Indian Rupees ONLY (% values are not allowed) in the e-procurement portal

d. It is mandatory to provide breakup of all Taxes, Duties and Levies wherever applicable and/or payable in the separate annexure 7.13 with Technical Bid. However, Authority shall consider Grand Total (Capex Price + Opex Price) exclusive of applicable taxes etc. for evaluation purpose

e. Authority reserves the right to ask the Bidder to submit proof of payment against any of the taxes, duties, levies indicated.

8.2 Price component for CAPEX

8.2.1 Integrated Traffic Control System

No.	BoM Lime Item	Quantity Proposed	Unit Base Price (In INR)	Total Cost
1	2	3	4	5 = 3*4
A	**Traffic Violation Detection System (RLVD system) at Traffic Junctions**			
A.1	TVDS system including ANPR Camera (4 arm, 1 lane each)	14 * 4 = 56		
A.2	TVDS system including ANPR Camera (3 arm, 1 lane each)	7 * 3 = 21		
A.3	TVDS system including ANPR Camera (2 arm, 1 lane each)	2 * 2 = 4		
A.4	IR Illuminator	81		
A.5	Wide angle evidence camera	81		
A.6	Pole Mounted Control Unit : including AC Power supply and UPS, CPU Sub Module, with all cabling, fittings, earthing , etc.	81		
A.7	RLVD Field Processing Unit	81		
A.8	6 Mtr Cantilever Pole as per site requirement	81		
A.9	Complete cabling and civil works as required	Lumpsum		
B	**Smart Traffic Signals (Signalization)**			
B.1	Signalization (2 arm junctions)	2		
B.2	Signalization (3 arm junctions)	7		
B.3	Signalization (4 arm junctions)	14		
B.4	**Pole Mounted Control Unit :** including AC Power supply and UPS, CPU Sub Module, with all cabling, fittings, earthing , etc	23		
B.5	Complete cabling and civil works as required	Lumpsum		
C	**Electronic Challan System**			
C.1	E-Challan Hand held devices with E-Challan s/w for Handheld	350		
D	**Additional Requirements**			
D.1	Any other Hardware or Software required to meet the RFP requirements (Bidder to list	Lumpsum		

No.	BoM Lime Item	Quantity Proposed	Unit Base Price (In INR)	Total Cost
1	2	3	4	5 = 3*4
	individual items and provide costing).			

8.2.2 Transit Management System

No.	BoM Lime Item	Quantity Proposed	Unit Base Price (In INR)	Total Cost
1	2	3	4	5 = 3*4
A	**Vehicle Tracking System (AVLS)**			
A.1	GPS/OBU for TRTC Buses	173		
A.2	**GPS/OBU for Emergency Vehicles**			
A.2.1	Government Ambulances	7		
A.3	**GPS/OBU for IPT**			
A.3.1	Autorickshaw	8000		
A.4	4G (or above) enabled SIM Cards	8180		
B	**Electronic Ticketing**			
B.1	Handheld ticketing machine with common payment system requirement and inclusive of all related accessories, software to meet the requirement	350		
B.2	4G (or above) enabled SIM Cards	350		
C	**Smart Bus Shelter/ Depots**			
C.1	19" size of PIS display at Bus Shelters/stops + UPS	45		
C.2	55" size of PIS display at Bus Depots + UPS	3		
C.3	Fixed Box Camera	45		
C.4	ECB/ Panic Button	45		
C.5	VMD board (at Bus Shelters including VMS controller) size 960mm*960mm*200 mm (minimum) with complete hardware and	45		

No.	BoM Lime Item	Quantity Proposed	Unit Base Price (In INR)	Total Cost
1	2	3	4	5 = 3*4
	accessories as required including UPS facility as per specifications			
C.6	VMS board including (at Bus Depots VMS controller size) 3000mm*1500mm*200 mm (minimum) with complete hardware and accessories as required + Mounting structure for VMS including UPS facility as per specifications	3		
C.7	4G (or above) enabled SIM Cards	100		
D	**Additional Requirements**			
D.1	Any other Hardware or Software required to meet the RFP requirements (Bidder to list individual items and provide costing).	Lumpsum		

8.2.3 Variable Message Display (VMD)

No.	BoM Lime Item	Quantity Proposed	Unit Base Price (In INR)	Total Cost
1	2	3	4	5 = 3*4
A	**Variable Message Displays (VMDs) at different location in the city**			
A.1	VMD board including VMS controller size 960mm*960mm*200 mm (minimum) with complete hardware and accessories as required including UPS facility as per specifications	11		
A.2	VMS board including VMS controller size 3000mm*1500mm*200 mm (minimum) with complete hardware and accessories as required + Mounting	12		

No.	BoM Lime Item	Quantity Proposed	Unit Base Price (In INR)	Total Cost
1	2	3	4	5 = 3*4
	structure for VMS including UPS facility as per specifications			
A.3	4G (or above) enabled SIM Cards	23		
B	**Additional Requirements**			
B.1	Any other Hardware or Software required to meet the RFP requirements (Bidder to list individual items and provide costing).	Lumpsum		

8.2.4 City Surveillance System

No.	BoM Lime Item	Quantity Proposed	Unit Base Price (In INR)	Total Cost
1	2	3	4	5 = 3*4
A	**CCTV Camera at different location in the city**			
A.1	Outdoor Box Camera	442		
A.2	Outdoor PTZ Camera	22		
A.3	IR Illuminator (for Outdoor Box Camera)	442		
A.4	Poles for Cameras and Equipment	131		
A.5	Industrial grade outdoor PoE switches	131		
A.6	Provision for Electrical Power	131		
A.7	Networking Cost (Passive Component : Junction Box, Patch Panel/LIU, OFC, Cat6 Cable, Patch Cords, Pipes, Earthing, Lighting arrester and electrical, earthing cables).	131		
A.8	UPS with Battery (appropriate Backup per technical specification and SLA mentioned in volume II of this RFP).	131		

No.	BoM Lime Item	Quantity Proposed	Unit Base Price (In INR)	Total Cost
1	2	3	4	5 = 3*4
A.9	Digging, Piping & Re-filling, including digging for electrical cabling	Lumpsum		
B	**Emergency Call Box**			
B.1	Emergency Call Box	1		
C	**Public Address System**			
C.1	Public Address System	1		
D	**Additional Requirements**			
D.1	Any other Hardware or Software required to meet the RFP requirements (Bidder to list individual items and provide costing).	Lumpsum		

8.2.5 Automatic Number Plate Recognition

No.	BoM Lime Item	Quantity Proposed	Unit Base Price (In INR)	Total Cost
1	2	3	4	5 = 3*4
A	**Automatic Number Plate Recognition (ANPR) system for 43 locations in city**			
A.1	ANPR Camera	43		
A.2	IR Illuminator	43		
A.3	Wide angle evidence camera	43		
A.4	Pole Mounted Control Unit : including AC Power supply and UPS, CPU Sub Module, with all cabling, fittings, earthing , etc.	12		
A.5	6 Mtr Cantilever Pole as per site requirement	12		
A.6	Complete cabling and civil works as required	Lumpsum		
B	**Additional Requirements**			
B.1	Any other Hardware or Software required to meet the RFP requirements (Bidder to list individual items and provide costing).	Lumpsum		

8.2.6 Intelligent Pole

No.	BoM Lime Item	Quantity Proposed	Unit Base Price (In INR)	Total Cost
1	2	3	4	5 = 3*4
A	**Intelligent Pole with all components at 6 locations in the city**			
A.1	**Smart Poles** with following minimum components along with their complete associated accessories as required: a. Intelligent Pole b. LED based Smart Street Light (LED Luminaire, LED Luminaire Controller) c. Public Wi-Fi (WLAN Controller, Access Point) d. Surveillance Cameras e. VMS f. Environmental Sensors g. UPS for battery backup	6		
B	**Additional Requirements**			
B.1	Any other Hardware or Software required to meet the RFP requirements (Bidder to list individual items and provide costing).	Lumpsum		

8.2.7 City Wide Wi-Fi

No.	BoM Lime Item	Quantity Proposed	Unit Base Price (In INR)	Total Cost
1	2	3	4	5 = 3*4
A	**Wi-Fi System at 23 locations in the city**			
A.1	Wi-Fi Access Point with controller	23		
B	**Additional Requirements**			
B.1	Any other Hardware or Software required to meet the RFP requirements (Bidder to list individual items and provide costing).	Lumpsum		

8.2.8 Digital Information Kiosk

No.	BoM Lime Item	Quantity Proposed	Unit Base Price (In INR)	Total Cost
1	2	3	4	5 = 3*4
A	**Digital Information Kiosk at different locations in the city**			
A.1	Multi Utility Digital Information Kiosk	26		
B	**Additional Requirements**			
B.1	Any other Hardware or Software required to meet the RFP requirements (Bidder to list individual items and provide costing).	Lumpsum		

8.2.9 Optical Fibre Cable

No.	BoM Lime Item	Quantity Proposed	Unit Base Price (In INR)	Total Cost
1	2	3	4	5 = 3*4
A	**Optical Fibre Cable laying**			
A.1	48 core (or above) optical fibre cable	102 KM		
A.2	UTP Cat 6 Armoured Cable (As per Bidder's Solution)	102		
A.3	Patch Cord	300		
A.4	Switches	51		
A.5	HDPE for laying OFC (Per Km)	102 KM		
A.6	Network Switch (Junctions)	51		
A.7	Junction Box	51		
A.8	Field UPS	51		
A.9	Patch Panel/ Fibre interface unit	51		
B	**Additional Requirements**			
B.1	Any other Hardware or Software required to meet the RFP requirements (Bidder to list individual items and provide costing).	Lumpsum		

8.2.10 Command and Control Centre

No.	BoM Lime Item	Quantity Proposed	Unit Base Price (In INR)	Total Cost
1	2	3	4	5 = 3*4
A	**Video Wall System**			
A.1	Video Wall Cubes (55”) LED in 5x2 matrix	10		
A.2	Video Wall Controller with Wall Management System	1		
B	**Hardware for ICCC**			
B.1	Multi-Function Laser Printer (City Control Room)	2		
B.2	Operator Workstations (City Control Room)	16		
B.3	IP Phones	25		
B.4	Digital Set top boxes	1		
B.5	Television Set (Meeting room)	1		
B.6	Office Desktop	5		
C	**Situation Room**			
C.1	55" LED display to present critical information Display	2		
C.2	Video Conferencing Unit	1		
D	**IP PBX System for ICCC**			
D.3	IP PABX System	1		
D.4	PRI Modem pair	2		
E	**Building Utilities for ICCC**			
E.1	DG Set (For IT load only)	1		
E.2	IBMS	1		
E.3	UPS with battery backup (as per technical specification in Vol 2 of RFP)	1		
E.4	Access Control System	1		
E.5	Electrical and Power cabling	1		
E.6	Electrical Cabling & Necessary illumination devices	1		
E.7	LAN and CAT-6 cabling	1		
E.8	Public Address System	1		
E.9	Fire & Smoke Detection System	3		

No.	BoM Lime Item	Quantity Proposed	Unit Base Price (In INR)	Total Cost
1	2	3	4	5 = 3*4
E.10	Fixed Dome Cameras with 32 channel NVR	6		
F	**Services for ICCC**			
F.1	DTH Subscription	1		
F.2	PRI Lines	1		
G	**Furniture**			
G.1	Furniture for city operations room operator desk	15		
G.2	Furniture for city operations room manager's desk	1		
G.3	Furniture for city operations room meeting table and chairs	1		
G.4	Furniture for city meeting room meeting table and chairs	1		
G.5	Furniture for contact center operators desk	4		
G.6	Furniture for security room desk	2		
G.7	Furniture for help desk team	2		
G.8	Furniture for Technical Support Team Desk	8		
G.9	Furniture for war room	1		
H	**Network & Security**			
H.1	Switches/ Router	2		
H.2	Networking/ IT racks	2		
H.3	MPLS Router	2		
H.4	Core Switch/ Data Center switch	2		
I	**Contact Center Operators**			
I.1	Contact Center Operators	24		
J	**Civil Works**			
J.1	Civil Work (Structure of building shall be provided by the City SPV, finishing which includes wiring, ducting, false ceiling, false flooring, etc. will be the responsibility of MSI)	1		

No.	BoM Lime Item	Quantity Proposed	Unit Base Price (In INR)	Total Cost
1	2	3	4	5 = 3*4
K	**Additional Requirements**			
K.1	Any other Hardware or Software required to meet the RFP requirements (Bidder to list individual items and provide costing).	Lumpsum		

8.2.11 Data Centre (To be hosted at State Data Centre)

No.	BoM Lime Item	Quantity Proposed	Unit Base Price (In INR)	Total Cost
1	2	3	4	5 = 3*4
A	**Servers**			
A.1	Integrated Traffic Management System	2		
A.2	ANPR	2		
A.3	RLVD	2		
A.4	Speed detection	2		
A.5	Automatic Vehicle Location System	2		
A.6	Electronic Ticketing	2		
A.7	Passenger Information System	2		
A.8	City Surveillance	2		
A.9	Electronic Call Box	2		
A.10	Variable Message Display	2		
A.11	Smart Pole	2		
A.12	Wi-Fi	2		
A.13	Digital Information Kiosk	2		
A.14	Fibre Management System	2		
A.15	Database Server	2		
A.16	E-Challan Server	2		
A.17	Server for CCC Application & other applications like IBMS, contact centre etc.	2		
B	**Application and System Software**			

No.	BoM Lime Item	Quantity Proposed	Unit Base Price (In INR)	Total Cost
1	2	3	4	5 = 3*4
B.1	ITMS Software	1		
B.2	Intelligent Pole	1		
B.3	Fibre Management System	1		
B.4	ICCC Application	1		
B.5	Contact Centre application and database	1		
C	**Other Components**			
C.1	IT Rack (42 U)	1		
C.2	Storage (SAN Switch)	1		
C.3	Storage (500 TB)	1		
C.4	Network Video Recording (NVR) System	1		
C.5	Video Management System (VMS)	1		
C.6	Tape Library	1		
C.7	LAN Switches (along with desired software system like OS, DB, etc.)	1		
C.8	Aggregation Router (along with desired software system like OS, DB, etc.)	1		
C.9	Access Switch (along with desired software system like OS, DB, etc.)	1		
C.10	Internet Router (along with desired software system like OS, DB, etc.)	1		
C.11	KVM Switch (along with desired software system like OS, DB, etc.)	1		
C.12	Core Switch (along with desired software system like OS, DB, etc.)	1		
C.13	Aggregation Switch (along with desired software system like OS, DB, etc.)	1		
C.14	Application Load balancer	1		
C.15	Server Load Balancer	1		

No.	BoM Lime Item	Quantity Proposed	Unit Base Price (In INR)	Total Cost
1	2	3	4	5 = 3*4
C.16	Link Load balancer	1		
C.17	Backup Software (per TB Capacity)	200		
C.18	Archival Software (per TB Capacity)	5		
D	**Additional requirement**			
D.1	Any other Hardware or Software required to meet the RFP requirements (Bidder to list individual items and provide costing).	Lumpsum		

8.2.12 Disaster Recovery (To be hosted at State Data Centre)

No.	BoM Lime Item	Quantity Proposed	Unit Base Price (In INR)	Total Cost
1	2	3	4	5 = 3*4
A	**Servers**			
A.1	Integrated Traffic Management System	1		
A.2	ANPR	1		
A.3	RLVD	1		
A.4	Speed detection	1		
A.5	Automatic Vehicle Location System	1		
A.6	Electronic Ticketing	1		
A.7	Passenger Information System	1		
A.8	City Surveillance	1		
A.9	Electronic Call Box	1		
A.10	Variable Message Display	1		
A.11	Smart Pole	1		
A.12	Wi-Fi	1		
A.13	Digital Information Kiosk	1		
A.14	Fibre Management System	1		
A.15	Database Server	1		
A.16	E-Challan Server	1		

No.	BoM Lime Item	Quantity Proposed	Unit Base Price (In INR)	Total Cost
1	2	3	4	5 = 3*4
A.17	Server for CCC Application & other applications like IBMS, contact centre etc.	1		
B	**Other Components**			
B.1	IT Rack (42 U)	1		
B.2	Storage (SAN Switch)	1		
B.3	Storage (500 TB)	1		
B.4	Network Video Recording (NVR) System	1		
B.5	Video Management System (VMS)	1		
B.6	Tape Library	1		
B.7	LAN Switches (along with desired software system like OS, DB, etc.)	1		
B.8	Aggregation Router (along with desired software system like OS, DB, etc.)	1		
B.9	Access Switch (along with desired software system like OS, DB, etc.)	1		
B.10	Internet Router (along with desired software system like OS, DB, etc.)	1		
B.11	KVM Switch (along with desired software system like OS, DB, etc.)	1		
B.12	Core Switch (along with desired software system like OS, DB, etc.)	1		
B.13	Aggregation Switch (along with desired software system like OS, DB, etc.)	1		
B.14	Application Load balancer	1		
B.15	Server Load Balancer	1		
B.16	Link Load balancer	1		
B.17	Backup Software (per TB Capacity)	200		

No.	BoM Lime Item	Quantity Proposed	Unit Base Price (In INR)	Total Cost
1	2	3	4	5 = 3*4
B.18	Archival Software (per TB Capacity)	5		
c	**Additional requirement**			
C.1	Any other Hardware or Software required to meet the RFP requirements (Bidder to list individual items and provide costing).	Lumpsum		

8.2.13 One Time Service Integration at ICCC

No.	Lime Item	Quantity Proposed	Unit Base Price (In INR)	Total Cost
1	2	3	4	5 = 3*4
1.	Integration of ICCC with Street Lighting	Lump Sum		
2.	Integration of ICCC with ITMS	Lump Sum		
3.	Integration of ICCC with Vehicle Tracking System	Lump Sum		
4.	Integration of ICCC with Digital Kiosk	Lump Sum		
5.	Integration of ICCC with City Surveillance System	Lump Sum		
6.	Integration of ICCC with PIS	Lump Sum		
7.	Integration of ICCC with GIS	Lump Sum		
8.	Integration of ICCC with e-Governance Applications & City Wide App	Lump Sum		
9.	Integration of ICCC with VMD	Lump Sum		
10.	Integration with Emergency Response and Disaster Mgmt.	Lump Sum		
11.	Integration with ECB/ PAS	Lump Sum		
12.	Integration with Wi-Fi system	Lump Sum		
13.	Integration of ICCC with ICT components at Poles	Lump Sum		
14.	Integration of ICCC with ICT SWM Garbage Collector	Lump Sum		

8.2.14 CCC Platform (DC Cloud)

No.	BoM Lime Item	Quantity Proposed	Unit Base Price (In INR)	Total Cost
1	2	3	4	5 = 3*4
A	**City Common Platform**			
A.1	Initial set up per city- Implementation, configuration and activation of City Operation Platform	1		
A.2	City GIS platform	1		

8.3 Price component for OPEX

The list of items indicated hereunder is indicative. The Bidder shall consider any additional line items with adequate details and pricing information in the table below, which may be required to fulfill the project requirements and functionality in totality.

- The Bidder shall offer default warranty of Five years (5) for all the supplied IT equipment. & shall extend comprehensive Annual Maintenance Contract (AMC) services for five (5) years for all the equipment/ infrastructure supplied.
- Bidder shall quote O&M support cost for all the 5 years.

8.3.1 Technical & Operational Manpower

#	Resource	Qty.	Year 1	Year 2	Year 3	Year 4	Year 5	Total
1	2	3	4	5	6	7	8	9 = 4+5+6+7+8
1	Project Manager	1						
2	ICCC Expert	1						
3	Solution Architect	1						
4	Integrated Traffic Management Expert	1						
5	Security & Surveillance Expert	1						
6	GIS Expert	1						
7	Network & Security Infrastructure Expert	1						
8	Server & Storage Expert	1						

8.3.2 Integrated Traffic Management System

No.	BoM Lime Item	Total Qty.	Year 1	Year 2	Year 3	Year 4	Year 5	Total
1	2	3	4	5	6	7	8	9 = 4+5+6+7+8
A	**Traffic Violation Detection System (RLVD system) at Traffic Junctions**							
A.1	TVDS system including ANPR Camera (4 arm, 1 lane each)	14 * 4 = 56						
A.2	TVDS system including ANPR Camera (3 arm, 1 lane each)	7 * 3 = 21						

No.	BoM Lime Item	Total Qty.	Year 1	Year 2	Year 3	Year 4	Year 5	Total
1	2	3	4	5	6	7	8	9 = 4+5+6+7+8
A.3	TVDS system including ANPR Camera (2 arm, 1 lane each)	2 * 2 = 4						
A.4	IR Illuminator	81						
A.5	Wide angle evidence camera	81						
A.6	Pole Mounted Control Unit : including AC Power supply and UPS, CPU Sub Module, with all cabling, fittings, earthing , etc.	81						
A.7	RLVD Field Processing Unit	81						
A.8	6 Mtr Cantilever Pole as per site requirement	81						
A.9	Complete cabling and civil works as required	Lumpsum						
B	**Smart Traffic Signal (Signalization)**							
B.1	Signalization (2 arm junctions)	2						
B.2	Signalization (3 arm junctions)	7						
B.3	Signalization (4 arm junctions)	14						
B.4	**Pole Mounted Control Unit :** including AC Power supply and UPS, CPU Sub Module, with all cabling, fittings, earthing , etc	23						
B.5	Complete cabling and civil works as required	Lumpsum						

No.	BoM Lime Item	Total Qty.	Year 1	Year 2	Year 3	Year 4	Year 5	Total
1	2	3	4	5	6	7	8	9 = 4+5+6+7+8
C	**Electronic Challan System**							
C.1	E-Challan Hand held devices with E-Challan s/w for Handheld	350						
D	**Additional Requirement**							
D.1	Any other Hardware or Software required to meet the RFP requirements (Bidder to list individual items and provide costing).	Lumpsum						

8.3.3 Transit Management System

No.	BoM Lime Item	Total Qty.	Year 1	Year 2	Year 3	Year 4	Year 5	Total
1	2	3	4	5	6	7	8	9 = 4+5+6+7+8
A	**Vehicle Tracking System (AVLS)**							
A.1	GPS/OBU for TRTC Buses	173						
A.2	**GPS/OBU for Emergency Vehicles**							
A.2.1	Government Ambulances	7						
A.3	**GPS/OBU for IPT**							
A.3.1	Autorickshaw	8000						
A.4	4G (or above) enabled SIM Cards	8180						
B	**Electronic Ticketing**							
B.1	Handheld ticketing machine with common payment system	350						

No.	BoM Lime Item	Total Qty.	Year 1	Year 2	Year 3	Year 4	Year 5	Total
1	2	3	4	5	6	7	8	9 = 4+5+6+7+8
	requirement and inclusive of all related accessories, software to meet the requirement							
B.2	4G (or above) enabled SIM Cards	350						
C	**Smart Bus Shelter/ Depots**							
C.1	19" size of PIS display at Bus Shelters/stops + UPS	45						
C.2	55" size of PIS display at Bus Depots + UPS	3						
C.3	Fixed Box Camera	45						
C.4	ECB/ Panic Button	45						
C.5	VMD board (at Bus Shelters including VMS controller) size 960mm*960mm* 200 mm (minimum) with complete hardware and accessories as required including UPS facility as per specifications	45						
C.6	VMS board including (at Bus Depots VMS controller size)	3						

No.	BoM Lime Item	Total Qty.	Year 1	Year 2	Year 3	Year 4	Year 5	Total
1	2	3	4	5	6	7	8	9 = 4+5+6+7+8
	3000mm*1500mm*200 mm (minimum) with complete hardware and accessories as required + Mounting structure for VMS including UPS facility as per specifications							
C.7	4G (or above) enabled SIM Cards	100						
D	**Additional Requirement**							
D.1	Any other Hardware or Software required to meet the RFP requirements (Bidder to list individual items and provide costing).	Lumpsum						

8.3.4 Variable Message Display (VMD)

No.	BoM Lime Item	Total Qty.	Year 1	Year 2	Year 3	Year 4	Year 5	Total
1	2	3	4	5	6	7	8	9 = 4+5+6+7+8
A	**Variable Message Displays (VMDs) at different location in the city**							
A.1	VMD board including VMS controller size 960mm*960mm *200 mm (minimum) with complete hardware and	11						

No.	BoM Lime Item	Total Qty.	Year 1	Year 2	Year 3	Year 4	Year 5	Total
1	2	3	4	5	6	7	8	9 = 4+5+6+7+8
	accessories as required including UPS facility as per specifications							
A.2	VMS board including VMS controller size 3000mm*1500mm*200 mm (minimum) with complete hardware and accessories as required + Mounting structure for VMS including UPS facility as per specifications	12						
A.3	4G (or above) enabled SIM Cards	23						
B	**Additional Requirements**							
B.1	Any other Hardware or Software required to meet the RFP requirements (Bidder to list individual items and provide costing).	Lumpsum						

8.3.5 City Surveillance System

No.	BoM Lime Item	Total Qty.	Year 1	Year 2	Year 3	Year 4	Year 5	Total
1	2	3	4	5	6	7	8	9 = 4+5+6+7+8
A	**CCTV Camera at different location in the city**							

No.	BoM Lime Item	Total Qty.	Year 1	Year 2	Year 3	Year 4	Year 5	Total
1	2	3	4	5	6	7	8	9 = 4+5+6+7+8
A.1	Outdoor Box Camera	442						
A.2	Outdoor PTZ Camera	22						
A.3	IR Illuminator (for Outdoor Box Camera)	442						
A.4	Poles for Cameras and Equipment	131						
A.5	Industrial grade outdoor PoE switches	131						
A.6	Provision for Electrical Power	131						
A.7	Networking Cost (Passive Component : Junction Box, Patch Panel/LIU, OFC, Cat6 Cable, Patch Cords, Pipes, Earthing, Lighting arrester and electrical, earthing cables).	131						
A.8	UPS with Battery (appropriate Backup per technical specification and SLA mentioned in volume II of this RFP).	131						
A.9	Digging, Piping & Re-filling, including digging for electrical cabling	Lumpsum						
B	**Emergency Call Box**							
B.1	Emergency Call Box	18						

No.	BoM Lime Item	Total Qty.	Year 1	Year 2	Year 3	Year 4	Year 5	Total
1	2	3	4	5	6	7	8	9 = 4+5+6+7+8
C	**Public Address System**							
C.1	Public Address System	18						
D	**Additional requirement**							
D.1	Any other Hardware or Software required to meet the RFP requirements (Bidder to list individual items and provide costing).	Lumpsum						

8.3.6 Automatic Number Plate Recognition

No.	BoM Lime Item	Total Qty.	Year 1	Year 2	Year 3	Year 4	Year 5	Total
1	2	3	4	5	6	7	8	9 = 4+5+6+7+8
A	**Automatic Number Plate Recognition (ANPR) system for 43 locations in city**							
A.1	ANPR Camera	43						
A.2	IR Illuminator	43						
A.3	Wide angle evidence camera	43						
A.4	Pole Mounted Control Unit : including AC Power supply and UPS, CPU Sub Module, with all cabling, fittings, earthing , etc.	12						
A.5	6 Mtr Cantilever Pole as per site requirement	12						
A.6	Complete cabling and civil works as required	Lumpsum						
B	**Additional requirement**							

No.	BoM Lime Item	Total Qty.	Year 1	Year 2	Year 3	Year 4	Year 5	Total
1	2	3	4	5	6	7	8	9 = 4+5+6+7+8
B.1	Any other Hardware or Software required to meet the RFP requirements (Bidder to list individual items and provide costing).	Lumpsum						

8.3.7 Intelligent Pole

No.	BoM Lime Item	Total Qty.	Year 1	Year 2	Year 3	Year 4	Year 5	Total
1	2	3	4	5	6	7	8	9 = 4+5+6+7+8
A	**Intelligent Pole with all components at 6 locations in the city**							
A.1	**Smart Poles** with following minimum components along with their complete associated accessories as required: a. Intelligent Pole b. LED based Smart Street Light (LED Luminaire, LED Luminaire Controller) c. Public Wi-Fi (WLAN Controller, Access Point) d. Surveillance Cameras e. VMS f. Environmental Sensors	6						

No.	BoM Lime Item	Total Qty.	Year 1	Year 2	Year 3	Year 4	Year 5	Total
1	2	3	4	5	6	7	8	9 = 4+5+6+7+8
	g. UPS for battery backup							
B	**Additional requirement**							
B.1	Any other Hardware or Software required to meet the RFP requirements (Bidder to list individual items and provide costing).	Lumpsum						

8.3.8 City Wide Wi-Fi

No.	BoM Lime Item	Total Qty.	Year 1	Year 2	Year 3	Year 4	Year 5	Total
1	2	3	4	5	6	7	8	9 = 4+5+6+7+8
A	**Wi-Fi System at 23 locations in the city**							
A.1	Wi-Fi Access Point with controller	23						
B	**Additional requirement**							
B.1	Any other Hardware or Software required to meet the RFP requirements (Bidder to list individual items and provide costing).	Lumpsum						

8.3.9 Digital Information Kiosk

No.	BoM Lime Item	Total Qty.	Year 1	Year 2	Year 3	Year 4	Year 5	Total
1	2	3	4	5	6	7	8	9 = 4+5+6+7+8
A	**Digital Information Kiosk at different locations in the city**							

No.	BoM Lime Item	Total Qty.	Year 1	Year 2	Year 3	Year 4	Year 5	Total
1	2	3	4	5	6	7	8	9 = 4+5+6+7+8
A.1	Multi Utility Digital Information Kiosk	26						
B	**Additional requirement**							
B.1	Any other Hardware or Software required to meet the RFP requirements (Bidder to list individual items and provide costing).	Lumpsum						

8.3.10 Optical Fibre Cable

No.	BoM Lime Item	Total Qty.	Year 1	Year 2	Year 3	Year 4	Year 5	Total
1	2	3	4	5	6	7	8	9 = 4+5+6+7+8
A	**Optical Fibre Cable Laying**							
A.1	48 core (or above) optical fibre cable	102 KM						
A.2	UTP Cat 6 Armoured Cable (As per Bidder's Solution)	102						
A.3	Patch Cord	300						
A.4	Switches	51						
A.5	HDPE for laying OFC (Per Km)	102 KM						
A.6	Network Switch (Junctions)	51						
A.7	Junction Box	51						
A.8	Field UPS	51						
A.9	Patch Panel/ Fibre interface unit	51						
B	**Additional Requirement**							

No.	BoM Lime Item	Total Qty.	Year 1	Year 2	Year 3	Year 4	Year 5	Total
1	2	3	4	5	6	7	8	9 = 4+5+6+7+8
B.1	Any other Hardware or Software required to meet the RFP requirements (Bidder to list individual items and provide costing).	Lumpsum						

8.3.11 Command and Control Centre

No.	BoM Lime Item	Total Qty.	Year 1	Year 2	Year 3	Year 4	Year 5	Total
1	2	3	4	5	6	7	8	9 = 4+5+6+7+8
A	**Video Wall System**							
A.1	Video Wall Cubes (55”) LED in 5x2 matrix	10						
A.2	Video Wall Controller with Wall Management System	1						
B	**Hardware for ICCC**							
B.1	Multi-Function Laser Printer (City Control Room)	2						
B.2	Operator Workstations (City Control Room)	16						
B.3	IP Phones	25						
B.4	Digital Set top boxes	1						
B.5	Television Set (Meeting room)	1						
B.6	Office Desktop	5						
C	**Situation Room**							
C.1	55" LED display to present critical information Display	2						

No.	BoM Lime Item	Total Qty.	Year 1	Year 2	Year 3	Year 4	Year 5	Total
1	2	3	4	5	6	7	8	9 = 4+5+6+7+8
C.2	Video Conferencing Unit	1						
D	**IP PBX System for ICCC**							
D.1	IP PABX System	1						
D.2	PRI Modem pair	2						
E	**Building Utilities for ICCC**							
E.1	DG Set (For IT load only)	1						
E.2	IBMS	1						
E.3	UPS with battery backup (as per technical specification in Vol 2 of RFP)	1						
E.4	Access Control System	1						
E.5	Electrical and Power cabling	1						
E.6	Electrical Cabling & Necessary illumination devices	1						
E.7	LAN and CAT-6 cabling	1						
E.8	Public Address System	1						
E.9	Fire & Smoke Detection System	3						
E.10	Fixed Dome Cameras with 32 channel NVR	6						
F	**Services for ICCC**							
F.1	DTH Subscription	1						
F.2	PRI Lines	1						
G	**Furniture**							
G.1	Furniture for city operations room operator desk	15						

No.	BoM Lime Item	Total Qty.	Year 1	Year 2	Year 3	Year 4	Year 5	Total
1	2	3	4	5	6	7	8	9 = 4+5+6+7+8
G.2	Furniture for city operations room manager's desk	1						
G.3	Furniture for city operations room meeting table and chairs	1						
G.4	Furniture for city meeting room meeting table and chairs	1						
G.5	Furniture for contact center operators desk	4						
G.6	Furniture for security room desk	2						
G.7	Furniture for help desk team	2						
G.8	Furniture for Technical Support Team Desk	8						
G.9	Furniture for war room	1						
H	**Network & Security**							
H.1	Switches/ Router	2						
H.2	Networking/ IT racks	2						
H.3	MPLS Router	2						
H.4	Core Switch/ Data Center switch	2						
I	**Contact Center Operators**							
I.1	Contact Center Operators	24						
J	**Civil Works**							
J.1	Civil Work (Structure of building shall be provided by the City SPV, finishing	1						

No.	BoM Lime Item	Total Qty.	Year 1	Year 2	Year 3	Year 4	Year 5	Total
1	2	3	4	5	6	7	8	9 = 4+5+6+7+8
	which includes wiring, ducting, false ceiling, false flooring, etc. will be the responsibility of MSI)							
K	**Additional Requirement**							
K.1	Any other Hardware or Software required to meet the RFP requirements (Bidder to list individual items and provide costing).	Lump sum						

8.3.12 Data Centre (To be hosted at State Data Centre)

No.	BoM Lime Item	Total Qty.	Year 1	Year 2	Year 3	Year 4	Year 5	Total
1	2	3	4	5	6	7	8	9 = 4+5+6+7+8
A	**Servers**							
A.1	Integrated Traffic Management System	2						
A.2	ANPR	2						
A.3	RLVD	2						
A.4	Speed detection	2						
A.5	Automatic Vehicle Location System	2						
A.6	Electronic Ticketing	2						
A.7	Passenger Information System	2						
A.8	City Surveillance	2						
A.9	Electronic Call Box	2						
A.10	Variable Message Display	2						
A.11	Smart Pole	2						

No.	BoM Lime Item	Total Qty.	Year 1	Year 2	Year 3	Year 4	Year 5	Total
1	2	3	4	5	6	7	8	9 = 4+5+6+7+8
A.12	Wi-Fi	2						
A.13	Digital Information Kiosk	2						
A.14	Fibre Management System	2						
A.15	Database Server	2						
A.16	E-Challan Server	2						
A.17	Server for CCC Application & other applications like IBMS, contact centre etc.	2						
B	**Application and System Software**							
B.1	ITMS Software	1						
B.2	Intelligent Pole	1						
B.3	Fibre Management System	1						
B.4	ICCC Application	1						
B.5	Contact Centre application and database	1						
C	**Other Components**							
C.1	IT Rack (42 U)	1						
C.2	Storage (SAN Switch)	1						
C.3	Storage (500 TB)	1						
C.4	Network Video Recording (NVR) System	1						
C.5	Video Management System (VMS)	1						
C.6	Tape Library	1						
C.7	LAN Switches (along with desired software system like OS, DB, etc.)	1						
C.8	Aggregation Router (along with desired	1						

No.	BoM Lime Item	Total Qty.	Year 1	Year 2	Year 3	Year 4	Year 5	Total
1	2	3	4	5	6	7	8	9 = 4+5+6+7+8
	software system like OS, DB, etc.)							
C.9	Access Switch (along with desired software system like OS, DB, etc.)	1						
C.10	Internet Router (along with desired software system like OS, DB, etc.)	1						
C.11	KVM Switch (along with desired software system like OS, DB, etc.)	1						
C.12	Core Switch (along with desired software system like OS, DB, etc.)	1						
C.13	Aggregation Switch (along with desired software system like OS, DB, etc.)	1						
C.14	Application Load balancer	1						
C.15	Server Load Balancer	1						
C.16	Link Load balancer	1						
C.17	Backup Software (per TB Capacity)	200						
C.18	Archival Software (per TB Capacity)	5						
D	**Additional Requirements**							
D.1	Any other Hardware or Software required to meet the RFP requirements (Bidder to list individual items and provide costing).	Lump sum						

8.3.13 Disaster Recovery (Cloud DR)

No.	BoM Lime Item	Total Qty.	Year 1	Year 2	Year 3	Year 4	Year 5	Total
1	2	3	4	5	6	7	8	9 = 4+5+6+7+8
A	**Servers**							
A.1	Integrated Traffic Management System	1						
A.2	ANPR	1						
A.3	RLVD	1						
A.4	Speed detection	1						
A.5	Automatic Vehicle Location System	1						
A.6	Electronic Ticketing	1						
A.7	Passenger Information System	1						
A.8	City Surveillance	1						
A.9	Electronic Call Box	1						
A.10	Variable Message Display	1						
A.11	Smart Pole	1						
A.12	Wi-Fi	1						
A.13	Digital Information Kiosk	1						
A.14	Fibre Management System	1						
A.15	Database Server	1						
A.16	E-Challan Server	1						
A.17	Server for CCC Application & other applications like IBMS, contact centre etc.	1						
B	**Other Components**							
B.1	IT Rack (42 U)	1						
B.2	Storage (SAN Switch)	1						
B.3	Storage (500 TB)	1						

No.	BoM Lime Item	Total Qty.	Year 1	Year 2	Year 3	Year 4	Year 5	Total
1	2	3	4	5	6	7	8	9 = 4+5+6+7+8
B.4	Network Video Recording (NVR) System	1						
B.5	Video Management System (VMS)	1						
B.6	Tape Library	1						
B.7	LAN Switches (along with desired software system like OS, DB, etc.)	1						
B.8	Aggregation Router (along with desired software system like OS, DB, etc.)	1						
B.9	Access Switch (along with desired software system like OS, DB, etc.)	1						
B.10	Internet Router (along with desired software system like OS, DB, etc.)	1						
B.11	KVM Switch (along with desired software system like OS, DB, etc.)	1						
B.12	Core Switch (along with desired software system like OS, DB, etc.)	1						
B.13	Aggregation Switch (along with desired software system like OS, DB, etc.)	1						
B.14	Application Load balancer	1						
B.15	Server Load Balancer	1						
B.16	Link Load balancer	1						
B.17	Backup Software (per TB Capacity)	200						

No.	BoM Lime Item	Total Qty.	Year 1	Year 2	Year 3	Year 4	Year 5	Total
1	2	3	4	5	6	7	8	9 = 4+5+6+7+8
B.18	Archival Software (per TB Capacity)	5						
C	**Additional Requirements**							
C.1	Any other Hardware or Software required to meet the RFP requirements (Bidder to list individual items and provide costing).	Lump sum						

8.3.14 CCC Platform (DC Cloud)

No.	BoM Lime Item	Total Qty.	Year 1	Year 2	Year 3	Year 4	Year 5	Total
1	2	3	4	5	6	7	8	9 = 4+5+6+7+8
A	**Intelligent Pole with all components at 6 locations in the city**							
A.1	Initial set up per city- Implementation, configuration and activation of City Operation Platform	1						
A.2	City GIS platform	1						

9. Annexure 5 (a) – Performance Bank Guarantee

Ref: _____ Date _____

Bank Guarantee No. _____

<Name>

<Designation>

<Address><Phone
Nos.><Fax
Nos.><Email id>

Whereas, <<name of the supplier and address>> (hereinafter called "the Master System Integrator") has undertaken, in pursuance of contract no. <Insert Contract No.> dated. <Date> to provide Implementation services for <<name of the assignment>> to Agartala Smart City Limited (hereinafter called "the Authority")

And whereas it has been stipulated by in the said contract that the bidder shall furnish you with a bank guarantee by a recognized bank for the sum specified therein as security for compliance with its obligations in accordance with the contract;

And whereas we, <Name of Bank> a banking company incorporated and having its head/registered office at <Address of Registered Office> and having one of its office at <Address of Local Office> have agreed to give the supplier such a bank guarantee.

Now, therefore, we hereby affirm that we are guarantors and responsible to you, on behalf of the supplier, up to a total of Indian Rupees<Insert Value> (Rupees <Insert Value in Words> only) and we undertake to pay you, upon your first written demand declaring the supplier to be in default under the contract and without cavil or argument, any sum or sums within the limits of Indian Rupees<Insert Value> (Rupees <Insert Value in Words> only) as aforesaid, without your needing to prove or to show grounds or reasons for your demand or the sum specified therein.

We hereby waive the necessity of your demanding the said debt from the bidder before presenting us with the demand.

We further agree that no change or addition to or other modification of the terms of the contract to be performed there under or of any of the contract documents which may be made between you and the Master System Integrator shall in any way release us from any liability under this guarantee and we hereby waive notice of any such change, addition or modification.

This Guarantee shall be valid until <<Insert Date>>)

Notwithstanding anything contained herein:

I. Our liability under this bank guarantee shall not exceed Indian Rupees<Insert Value> (Rupees <Insert Value in Words> only).

II. This bank guarantee shall be valid up to <Insert Expiry Date>)

III. It is condition of our liability for payment of the guaranteed amount or any part thereof arising under this bank guarantee that we receive a valid written claim or demand for payment under this bank guarantee on or before <Insert Expiry Date>) failing which our liability under the guarantee will automatically cease.

Date _____

Place _____ Signature _____

Witness _____ Printed name _____

(Bank's common seal)

10.Annexure 5 (b) – Bank Guarantee for Earnest Money Deposit

To,

<Name>

<Designation>

<Address>

<Phone Nos.>

<Fax Nos.>

<Email id>

Whereas <<Name of the bidder>> (hereinafter called 'the Master System Integrator') has submitted the bid for Submission of RFP <<RFP Number>> dated <<Date>> for <<Name of the assignment>> (hereinafter called "the Bid") to <<Authority>>.

Know all Men by these presents that we <<… >> having our office at <<Address>> (hereinafter called "the Bank") are bound unto the <<Authority>> (hereinafter called "the Authority") in the sum of Indian Rupees<<Amount in figures>> (Rupees <<Amount in words>> only) for which payment well and truly to be made to the said Authority, the Bank binds itself, its successors and assigns by these presents. Sealed with the Common Seal of the said Bank this <<Date>>.

The conditions of this obligation are:

1. If the Bidder having its bid withdrawn during the period of bid validity specified by the Bidder on the Bid Form; or

2. If the Bidder, having been notified of the acceptance of its bid by the Authority during the period of validity of bid

(a) Withdraws his participation from the bid during the period of validity of bid document; or

(b) Fails or refuses to participate in the subsequent Tender process after having been short listed;

We undertake to pay to the Authority up to the above amount upon receipt of its first written demand, without the Authority having to substantiate its demand, provided that in its demand the Authority will note that the amount claimed by it is due to it owing to the occurrence of one or both of the two conditions, specifying the occurred condition or conditions.

This guarantee will remain in force up to <<insert date>> and including <<extra time over and above mandated in the RFP>> from the last date of submission and any demand in respect thereof should reach the Bank not later than the above date.

NOTHWITHSTANDING ANYTHING CONTAINED HEREIN:

I. Our liability under this Bank Guarantee shall not exceed Indian Rupees<<Amount in figures>> (Rupees

<<Amount in words>> only)

II. This Bank Guarantee shall be valid up to <<*insert date*>>)

III. It is condition of our liability for payment of the guaranteed amount or any part thereof arising under this Bank Guarantee that we receive a valid written claim or demand for payment under this Bank Guarantee on or before <<insert date>>) failing which our liability under the guarantee will automatically cease.

(Authorized Signatory of the Bank)

Seal:

Date:

11.Annexure 6 – Non-Disclosure Agreement

WHEREAS, we the undersigned Bidder, _____, having our principal place of business or registered office at _____, are desirous of bidding for RFP No. <<>> dated <<DD-MM-2018>> "**RFP for selection of Master System Integrator for implementation of Integrated Command and Control Centre and Smart Elements in Agartala City"** (hereinafter called the said 'RFP') to the "Agartala Smart City Limited", hereinafter referred to as 'Authority'

And,

WHEREAS, the Bidder is aware and confirms that the Authority's business or operations, information, application or software, hardware, business data, architecture schematics, designs, storage media and other information or documents made available by the Authority in the RFP documents during the bidding process and thereafter, or otherwise (confidential information for short) is privileged and strictly confidential and or proprietary to the Authority,

NOW THEREFORE, in consideration of disclosure of confidential information, and in order to ensure the Authority's grant to the Bidder of specific access to Authority's confidential information, property, information systems, network, databases and other data, the Bidder agrees to all of the following conditions.

It is hereby agreed as under:

1. The confidential information to be disclosed by the Authority under this Agreement ("Confidential Information") shall include without limitation, any and all information in written, representational, electronic, verbal or other form relating directly or indirectly to processes, methodologies, algorithms, risk matrices, thresholds, parameters, reports, deliverables, work products, specifications, architecture, project information, security or zoning strategies & policies, related computer programs, systems, trend analysis, risk plans, strategies and information communicated or obtained through meetings, documents, correspondence or inspection of tangible items, facilities or inspection at any site to which access is permitted by the Authority.
2. Confidential Information does not include information which:
    a. the Bidder knew or had in its possession, prior to disclosure, without limitation on its confidentiality;
    b. information in the public domain as a matter of law;
    c. is obtained by the Bidder from a third party without any obligation of confidentiality;
    d. the Bidder is required to disclose by order of a competent court or regulatory authority;
    e. Is released from confidentiality with the written consent of the Authority.

    The Bidder shall have the burden of proving hereinabove are applicable to the information in the possession of the Bidder.

3. The Bidder agrees to hold in trust any Confidential Information received by the Bidder, as part of the Tendering process or otherwise, and the Bidder shall maintain strict confidentiality in respect of such Confidential Information, and in no event a degree of confidentiality less than the Bidder uses to protect its own confidential and proprietary information. The Bidder also agrees:

   a. to maintain and use the Confidential Information only for the purposes of bidding for this RFP and thereafter only as expressly permitted herein;

   b. to only make copies as specifically authorized by the prior written consent of the Authority and with the same confidential or proprietary notices as may be printed or displayed on the original;

   c. to restrict access and disclosure of Confidential Information to their employees, agents, consortium members and representatives strictly on a "need to know" basis, to maintain confidentiality of the Confidential Information disclosed to them in accordance with this clause; and

   d. To treat Confidential Information as confidential unless and until Authority expressly notifies the Bidder of release of its obligations in relation to the said Confidential Information.

4. Notwithstanding the foregoing, the Bidder acknowledges that the nature of activities to be performed as part of the Tendering process or thereafter may require the Bidder's personnel to be present on premises of the Authority or may require the Bidder's personnel to have access to software, hardware, computer networks, databases, documents and storage media of the Authority while on or off premises of the Authority. It is understood that it would be impractical for the Authority to monitor all information made available to the Bidder's personnel under such circumstances and to provide notice to the Bidder of the confidentiality of all such information.

5. Therefore, the Bidder shall disclose or allow access to the Confidential Information only to those personnel of the Bidder who need to know it for the proper performance of their duties in relation to this project, and then only to the extent reasonably necessary. The Bidder will take appropriate steps to ensure that all personnel to whom access to the Confidential Information is given are aware of the Bidder's confidentiality obligation. Further, the Bidder shall procure that all personnel of the Bidder are bound by confidentiality obligation in relation to all proprietary and Confidential Information received by them which is no less onerous than the confidentiality obligation under this agreement.

6. The Bidder shall establish and maintain appropriate security measures to provide for the safe custody of the Confidential Information and to prevent unauthorized access to it.

7. The Bidder agrees that upon termination or expiry of this Agreement or at any time during its currency, at the request of the Authority, the Bidder shall promptly deliver to the Authority the

Confidential Information and copies thereof in its possession or under its direct or indirect control, and shall destroy all memoranda, notes and other writings prepared by the Bidder or its Affiliates or directors, officers, employees or advisors based on the Confidential Information and promptly certify such destruction.

8. Confidential Information shall at all times remain the sole and exclusive property of the Authority. Upon completion of the Tendering process and or termination of the contract or at any time during its currency, at the request of the Authority, the Bidder shall promptly deliver to the Authority the Confidential Information and copies thereof in its possession or under its direct or indirect control, and shall destroy all memoranda, notes and other writings prepared by the Bidder or its Affiliates or directors, officers, employees or advisors based on the Confidential Information within a period of sixty days from the date of receipt of notice, or destroyed, if incapable of return. The destruction shall be witnessed and so recorded, in writing, by an authorized representative of the Authority. Without prejudice to the above the Bidder shall promptly certify to the Authority, due and complete destruction and return. Nothing contained herein shall in any manner impair rights of the Authority in respect of the Confidential Information.

9. In the event that the Bidder hereto becomes legally compelled to disclose any Confidential Information, the Bidder shall give sufficient notice and render best effort assistance to the Authority to enable the Authority to prevent or minimize to the extent possible, such disclosure. Bidder shall not disclose to a third party any Confidential Information or the contents of this RFP without the prior written consent of the Authority. The obligations of this Clause shall be satisfied by handling Confidential Information with the same degree of care, which the Bidder applies to its own similar Confidential Information but in no event less than reasonable care.

For and on behalf of:

(BIDDER)

Authorised Signatory	Office Seal:
Name:	Place:
Designation:	Date :

12.Annexure 7 - Consortium Agreement

DRAFT MEMORANDUM OF UNDERSTANDING EXECUTED BY MEMBERS OF THE CONSORTIUM

[On Non-judicial stamp paper of Indian Rupees 100 duly attested by notary public]

This Memorandum of Understanding (MoU) entered into this day of [*Date*] [*Month*] 2018 at [*Place*] among _____ _____ (hereinafter referred to as "____") and having office at [*Address*], India, as Party of the First Part and _____ _____ (hereinafter referred as "____") and having office at [*Address*], as Party of the Second Part and _____ _____

(herein after referred as "___") and having office at [*Address*], as Party of the Third Part.

The parties are individually referred to as Party and collectively as Parties.

WHEREAS Agartala Smart City Limited has issued a Request for Proposal dated [*Date*] (RFP) from the Applicants interested in **Request for Proposal for Selection of Master System Integrator for Implementation of Integrated Command & Control Centre and Smart Elements in Agartala Smart City Solution for Authority:**

AND WHEREAS the Parties have had discussions for formation of a Consortium for bidding for the said Project and have reached an understanding on the following points with respect to the Parties' rights and obligations towards each other and their working relationship.

AS MUTUTAL UNDERSTANDING OF THE PARTIES, IT IS HEREBY AGREED AND DECLARED AS FOLLOWS:

i. The purpose of this Agreement is to define the principles of collaboration among the Parties to:

   a) Submit a response jointly to Bid for the "**RFP for selection of Master System Integrator for implementation of Integrated Command and Control Centre and Smart Elements in Agartala City"** as a Consortium.

   b) Sign Contract in case of award.

   c) Provide and perform the supplies and services which would be ordered by the Authority pursuant to the Contract.

ii. This Agreement shall not be construed as establishing or giving effect to any legal entity such as, but not limited to, a company, a partnership, etc. It shall relate solely towards the Authority for "Request for Proposal for Selection of System Integrator for Implementation of Agartala Smart City Solution"" for and related execution works to be performed pursuant to the Contract and shall not extend to any other activities.

iii. The Parties shall be jointly and severally responsible and bound towards the Authority for the performance of the works in accordance with the terms and conditions of the BID document, and Contract.

iv. ---------- (Name of Party) shall act as Lead Partner of the Consortium. As such, it shall act as the coordinator of the Party's combined activities and shall carry out the following functions:

a) To ensure the technical, commercial and administrative co-ordination of the work package

b) To lead the contract negotiations of the work package with the Authority.

c) The Lead partner is authorized to receive instructions and incur liabilities for and on behalf of all Parties.

d) In case of an award, act as channel of communication between the Authority and the Parties to execute the Contract

v. That the Parties shall carry out all responsibilities as Developer in terms of the Project Agreement.

vi. That the broad roles and the responsibilities of each Party at each stage of the Bidding shall be as below:

Party A: _____

Party B: _____

Party C: _____

Party D: _____

Party E: _____

vii. That the Parties affirm that they shall implement the Project in good faith and shall take all necessary steps to see the Project through expeditiously.

viii. That this MoU shall be governed in accordance with the laws of India and courts in Tripura State shall have exclusive jurisdiction to adjudicate disputes arising from the terms herein.

In witness whereof the Parties affirm that the information provided is accurate and true and have caused this MoU duly executed on the date and year above mentioned.

(Party of the first part) (Party of the second part) (Party of the third part)

Witness:

i. _____ ____

ii. _____ ____

13.Annexure 8 - Format for Power of Attorney to Authorize Signatory

POWER OF ATTORNEY

[To be executed on non-judicial stamp paper of the appropriate value in accordance with relevant Stamp Act. The stamp paper to be in the name of the company who is issuing the power of attorney.]

We, M/s._____ (name of the firm or company with address of the registered office) hereby constitute, appoint and authorize Mr. or Ms._____ (Name and residential address) who is presently employed with us and holding the position of _____, as our Attorney to do in our name and our behalf all or any of the acts, deeds or things necessary or incidental to our RFP for the Project _____ (name of the Project), including signing and submission of the RFP response, participating in the meetings, responding to queries, submission of information or documents and generally to represent us in all the dealings with Client or any other Government Agency or any person, in connection with the works until culmination of the process of bidding till the Project Agreement is entered into with _____ (Client) and thereafter till the expiry of the Project Agreement.

We hereby agree to ratify all acts, deeds and things lawfully done by our said Attorney pursuant to this power of attorney and that all acts, deeds and things done by our aforesaid Attorney shall and shall always be deemed to have been done by us.

(Add in the case of a Consortium)

Our firm is a Member or Lead bidder of the Consortium of _____, _____ and _____.

Dated this the _____ day of _____ 2018

(Signature and Name of authorized signatory)

_____

(Signature and Name in block letters of all the remaining partners of the firm Signatory for the Company)

Seal of firm Company

Witness 1: Witness 2:

Notes:

a. *To be executed by all the members individually.*

b. *The Mode of execution of the power of attorney should be in accordance with the procedure, if any laid down by the applicable law and the charter documents of the executant(s) and when it is so required the same should be under common seal affixed in accordance with the required procedure.*

14. Annexure 9 - Format for Power of Attorney for Lead bidder of Consortium

[To be executed on non-judicial stamp paper of the appropriate value in accordance with relevant Stamp Act. The stamp paper to be in the name of the company who is issuing the power of attorney]

Whereas _____ has invited RFP response for _____ (Name of the Project)

Whereas, the Members of the Consortium comprising of M/s._____, M/s._____, and M/s._____ (the respective names and addresses of the registered offices to be given) are interested in bidding for the Project and implementing the same in accordance with the terms and conditions contained in the RFP Documents.

Whereas, it is necessary for the members of the Consortium to designate one of them as the lead member with all necessary power and authority to do, for and on behalf of the Consortium, all acts, deeds and things as may be necessary in connection with the Consortium's RFP response for the Project.

NOW THIS POWER OF ATTORNEY WITNESSETH THAT

We, M/s._____ and M/s _____ hereby designate M/s. _____

being one of the members of the Consortium, as the lead member of the Consortium, to do on behalf of the Consortium, all or any of the acts, deeds or things necessary or incidental to the Consortium's RFP response for the Project, including submission of the RFP response, participating in meetings, responding to queries, submission of information or documents and generally to represent the Consortium in all its dealings with Client or any other Government Agency or any person, in connection with the Project until culmination of the process of bidding till the Project Agreement is entered into with Client and thereafter till the expiry of the Project Agreement.

We hereby agree to ratify all acts, deeds and things lawfully done by our said Attorney pursuant to this power of attorney and that all acts, deeds and things done by our aforesaid Attorney shall and shall always be deemed to have been done by us or Consortium.

Dated this the _____ day of _____ 2018

(Signature)

(Name in Block Letter of Executant) *[Seal of Company]*

Witness 1 Witness 2

*Notes: To be executed by all the members individually, in case of a Consortium/*Joint Venture.

The Mode of execution of the power of attorney should be in accordance with the procedure, if any laid down by the applicable law and the charter documents of the executant(s) and when it is so required the same should be under common seal affixed in accordance with the required procedure.

15. Annexure 10: Format of Agreement between Bidder and their parent company / subsidiary / Sister Concern Company (As the case may be)

(TO BE EXECUTED ON STAMP PAPER OF REQUISITE VALUE AND NOTORISED)

This agreement made this ___ day of ____ month ____ year by and between M/s. _____ (Fill in the Bidder's full name, constitution and registered office address) hereinafter referred to as bidder on the first part and M/s. _____ (Fill in full name, constitution and registered office address of Parent Company/Subsidiary / Sister Concern Company, as the case may be) hereinafter referred to as "Parent Company/ Subsidiary Company/ Sister Concern Company (Delete whichever not applicable)" of the other part:

WHEREAS

Agartala Smart City Limited (hereinafter referred to as ASCL) has invited offers vide their tender No. _____ for _____ and

M/s. _____(Bidder) intends to bid against the said tender and desires to have technical support of M/s. _____[Parent Company/ Subsidiary Company/ Sister Concern Company- (Delete whichever not applicable)] and whereas Parent Company/ Subsidiary Company/ Sister Concern Company (Delete whichever not applicable) represents that they have gone through and understood the requirements of subject tender and are capable and committed to provide the services as required by the bidder for successful execution of the contract, if awarded to the bidder.

Now, it is hereby agreed to by and between the parties as follows:

1. M/s._____(Bidder) will submit an offer to ASCL for the full scope of work as envisaged in the tender document as a main bidder and liaise with ASCL directly for any clarifications etc. in this context.
2. M/s. _____ (Parent Company/ Subsidiary Company/ Sister Concern Company (Delete whichever not applicable) undertakes to provide technical support and expertise, expert manpower and procurement assistance and project management to support the bidder to discharge its obligations as per the Scope of work of the tender / Contract for which offer has been made by the Parent Company/Subsidiary Company/Sister Concern Company (Delete whichever not applicable) and accepted by the bidder.
3. This agreement will remain valid till validity of bidder's offer to ASCL including extension if any and till satisfactory performance of the contract in the event the contract is awarded by ASCL to the bidder.
4. It is further agreed that for the performance of work during contract period bidder and Parent Company/Subsidiary Company/Sister Concern Company (Delete whichever not applicable) shall be jointly and severely responsible to ASCL for satisfactory execution of the contract.

5. However, the bidder shall have the overall responsibility of satisfactory execution of the contract awarded by ASCL.

In witness whereof the parties hereto have executed this agreement on the date mentioned above.

For and on behalf of _____ (Bidder) Signature: Name: Designation: **Witness 1:** Signature: Full name: Address: **Witness 2:** Signature: Full name: Address:	For and on behalf of _____ (Parent/subsidiary/sister concern company) Signature: Name: Designation: **Witness 1:** Signature: Full name: Address: **Witness 2:** Signature: Full name: Address:

16. Annexure 11: Format of Parent company / Subsidiary / Sister Concern Company Guarantee

(As the case may be)

(TO BE EXECUTED ON STAMP PAPER OF REQUISITE VALUE AND NOTORISED)

DEED OF GUARANTEE

THIS DEED OF GUARANTEE executed at ……. this …….. day of …… by M/s …… (mention complete name) a company duly organized and existing under the laws of …….. (insert jurisdiction/country), having its Registered Office at …… hereinafter called "the Guarantor" which expression shall, unless excluded by or repugnant to the subject or context thereof, be deemed to include its successors and permitted assigns.

WHEREAS

Agartala Smart City Limited, a statutory body under _____ , having its Registered Office at _____, hereinafter called "ASCL" which expression shall unless excluded by or repugnant to the context thereof, be deemed to include its successor and assigns, invited tender number …… for …….. on ……..

M/s …….. (mention complete name), a company duly organized and existing under the laws of …….. (insert jurisdiction/country), having its Registered Office at …….. (give complete address) hereinafter called "the Company" which expression shall, unless excluded by or repugnant to the subject or context thereof, be deemed to include its successor and permitted assigns, have, in response to the above mentioned tender invited by ASCL, submitted their bid number …… to ASCL with one of the condition that the Company shall arrange a guarantee from its parent company guaranteeing due and satisfactory performance of the work covered under the said tender including any change therein as may be deemed appropriate by ASCL at any stage.

The Guarantor represents that they have gone through and understood the requirement of the above said tender and are capable of and committed to provide technical and such other supports as may be required by the Company for successful execution of the same.

The Company and the Guarantor have entered into an agreement dated …….. as per which the Guarantor shall be providing technical and such other supports as may be necessary for performance of the work relating to the said tender.

Accordingly, at the request of the Company and in consideration of and as a requirement for ASCL to enter into agreement(s) with the Company, the Guarantor hereby agrees to give this guarantee and undertakes as follows:

a. The Guarantor (Parent Company / 100% Subsidiary Company/ Sister Concern (Delete whichever not applicable) unconditionally agrees that in case of non-performance by the Company of any of its obligations in any respect, the Guarantor shall, immediately on receipt of

notice of demand by ASCL, take up the job without any demur or objection, in continuation and without loss of time and without any cost to ASCL and duly perform the obligations of the Company to the satisfaction of ASCL.

b. The Guarantor agrees that the Guarantee herein contained shall remain valid and enforceable till the satisfactory execution and completion of the work (including discharge of the warranty obligations) awarded to the Company.

c. The Guarantor shall be jointly with the Company and also severally responsible for satisfactory performance of the contract entered between the Company and ASCL.

d. The liability of the Guarantor, under the Guarantee, is limited to the 50% of the annualized contract price entered between the Company and ASCL. This will, however, be in addition to the forfeiture of the Performance Bank Guarantee furnished by the Company.

e. The Guarantor represents that this Guarantee has been issued after due observance of the appropriate laws in force in India. The Guarantor hereby undertakes that the Guarantor shall obtain and maintain in full force and effect all the governmental and other approvals and consents that are necessary and do all other acts and things necessary or desirable in connection therewith or for the due performance of the Guarantor's obligations hereunder.

f. The Guarantor also agrees that this Guarantee shall be governed and construed in accordance with the laws in force in India and subject to the exclusive jurisdiction of the courts of Agartala, Tripura.

g. The Guarantor hereby declares and represents that this Guarantee has been given without any undue influence or coercion, and that the Guarantor has fully understood the implications of the same.

h. The Guarantor hereby agrees that no change or addition to or other modification of the terms of the contract to be performed there under or of any of the contract documents which may be made between ASCL and the Bidder Company shall in any way release Guarantor from any liability under this guarantee and Guarantor hereby waive notice of any such change, addition or modification.

i. The Guarantor represents and confirms that the Guarantor has the legal capacity, power and authority to issue this Guarantee and that giving of this Guarantee and the performance and observations of the obligations hereunder do not contravene any existing laws.

For and on behalf of _____ (name of the Parent Company/Subsidiary/Sister Concern company)

Signature: _____

Name: _____

Designation: _____

Common seal of the guarantor company:

Witness 1:

Signature: _____

Full Name: _____

Address: _____

Witness 2:

Signature: _____

Full Name: _____

Address: _____

INSTRUCTIONS FOR FURNISHING PARENT/SUBSIDIARY/SISTER CONCERN COMPANY GUARANTEE

1. Guarantee should be executed on stamp paper of requisite value and notarised.
2. The official(s) executing the guarantee should affix full signature (s) on each page.
3. Resolution passed by Board of Directors of the guarantor company authorizing the signatory (ies) to execute the guarantee, duly certified by the Company Secretary should be furnished along with the Guarantee.
4. Following certificate issued by Company Secretary of the guarantor company should also be enclosed along with the Guarantee.

"Obligation contained in the deed of guarantee No._____ furnished against tender No. _____ are enforceable against the guarantor company and the same do not, in any way, contravene any law of the country of which the guarantor company is the subject"

REQUEST FOR PROPOSAL

FOR

SELECTION OF MASTER SYSTEM INTEGRATOR FOR IMPLEMENTATION OF INTEGRATED COMMAND & CONTROL CENTER AND SMART ELEMENTS IN

AGARTALA CITY

Volume 2 – Scope of Work

RFP Number: ASCL/RFP/04/06

Date: 19th April 2018

Invited by:

Agartala Smart City Limited (ASCL)
5th Floor, Agartala Municipal Corporation,
Paradise Chowmuhani,
Agartala - 799001

Table of Contents

1. Disclaimer

The information contained in this Request for Proposal document ("**RFP**") whether subsequently provided to the bidders, ("**Bidder/s**") verbally or in documentary form by Agartala Smart City Limited (henceforth referred to as "**ASCL**" in this document) or any of its employees or advisors, is provided to Bidders on the terms and conditions set out in this Tender document and any other terms and conditions subject to which such information is provided.

This RFP is not an agreement and is not an offer or invitation to any party. The purpose of this RFP is to provide the Bidders or any other person with information to assist the formulation of their financial offers ("**Bid**"). This RFP includes statements, which reflect various assumptions and assessments arrived at by ASCL in relation to this scope. This Tender document does not purport to contain all the information each Bidder may require. This Tender document may not be appropriate for all persons, and it is not possible for the Chief Exceutive Officer, ASCL and their employees or advisors to consider the objectives, technical expertise and particular needs of each Bidder. The assumptions, assessments, statements and information contained in the Bid documents, may not be complete, accurate, adequate or correct. Each Bidder must therefore conduct its own analysis of the information contained in this RFP and to seek its own professional advice from appropriate sources.

Information provided in this Tender document to the Bidder is on a wide range of matters, some of which may depend upon interpretation of law. The information given is not intended to be an exhaustive account of statutory requirements and should not be regarded as a complete or authoritative statement of law. ASCL accepts no responsibility for the accuracy or otherwise for any interpretation of opinion on law expressed herein.

ASCL and their employees and advisors make no representation or warranty and shall incur no liability to any person, including the Bidder under law, statute, rules or regulations or tort, the principles of restitution or unjust enrichment or otherwise for any loss, cost, expense or damage which may arise from or be incurred or suffered on account of anything contained in this RFP or otherwise, including the accuracy, reliability or completeness of the RFP, and any assessment, assumption, statement or information contained therein or deemed to form part of this RFP or arising in any way in this Selection Process.

ASCL also accepts no liability of any nature whether resulting from negligence or otherwise howsoever caused arising from reliance of any Bidder upon the statements contained in this RFP. ASCL may in its absolute discretion, but without being under any obligation to do so, can amend or supplement the information in this RFP.

The issue of this Tender document does not imply that ASCL is bound to select a Bidder or to appoint the Selected Bidder (as defined hereinafter), for implementation and ASCL reserves the right to reject all or any of the Bidders or Bids without assigning any reason whatsoever.

The Bidder shall bear all its costs associated with or relating to the preparation and submission of its Bid including but not limited to preparation, copying, postage, delivery fees, expenses associated with any demonstrations or presentations which may be required by ASCL or any other costs incurred in connection with or relating to its Bid. All such costs and expenses will remain with the Bidder and

ASCL shall not be liable in any manner whatsoever for the same or for any other costs or other expenses incurred by a Bidder in preparation for submission of the Bid, regardless of the conduct or outcome of the Selection process.

2. Glossary

Terms	Meaning
ASCL	Agartala Smart City Limited
RFP	Request for Proposal
CCTV	Closed Circuit Television
BOM	Bill of Material
GIS	Geographical Information Systems
GPS	Global Positioning System
ICT	Information and Communication Technology
OEM	Original Equipment Manufacture
MSI	Master System Integrator
SOP	Standard Operating Procedures
UAT	User Acceptance Testing
VM	Virtual Machine
ICCC	Integrated Command and Control Center
ICOC	Integrated Command and Operation Center
ITMS	Integrated Traffic Management System
ATCS	Adaptive Traffic Control System
DC	Data Centre
IT	Information Technology
IP	Internet Protocol
O&M	Operations and Maintenance
OFC	Optical Fiber Cable
PA System	Public Address System
ANPR	Automatic Number Plate Recognition
RLVD	Red Light Violation Detection
SVD	Speed Violation Detection
PTZ	Pan Tilt Zoom
PoP	Point of Presence
TPA	Third Party Auditor
FMS	Facility Management Services
UPS	Uninterrupted Power Supply
VMD	Variable Message Display
GSM	Global System for Mobile Communication
AP	Access Points

3. Introduction

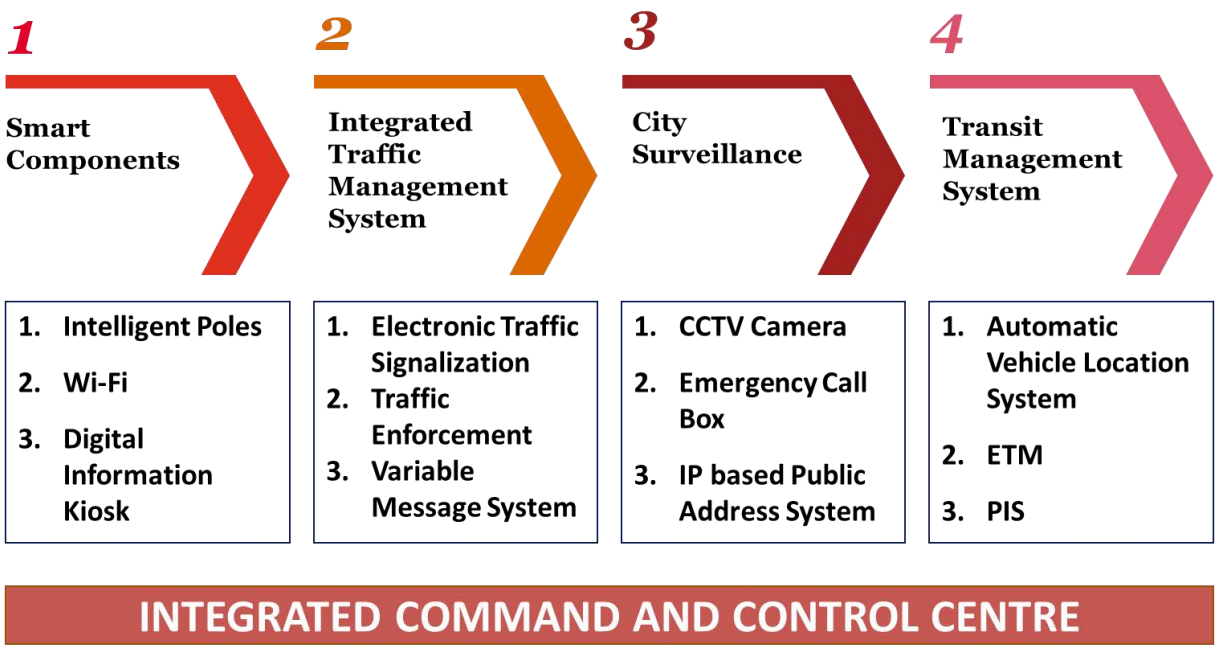
3.1. Project Background

One of the primary objective of ASCL under its smart city mission is to enhance the safety and security, improve traffic management, improve efficiency of municipal services and promote a better quality of life for residents. In order to achieve these objectives, ASCL desires to foster the development of a robust ICT infrastructure that supports digital applications and ensures seamless steady state operations, city transport services, traffic management, surveillance, emergency response mechanisms, real time tracking of services and vital city metrics throughout the city and in government departments.

ASCL is considering the appointment of an agency to set up these priority initiatives identified under Smart City Mission which includes Integrated Command and Control center (ICCC) and Smart Elements like Integrated Traffic Management System, Rapid Transit System, OFC, Wi-Fi Hotspots, City Surveillance, etc.

Main objective of the project is to break silos in the city within the departments and across the departments. Also to install appropriate check points for solutions implemented, so that the services delivered to the public are up to their expectation.

Following city-wide domains will be covered under the scope of this project through ICT interventions.



The components mentioned in the figure above will be implemented along with implementation of Integrated Command and Control Centre. Also the scope of this RFP covers integration of all the

above mentioned components with the Integrated Command and Control Centre to generate the Common Operating Picture

3.2. Project Objectives

One of the primary objectives of Agartala Smart City Limited (ASCL) under its Smart City Mission is to drive citizen centric services through improvements in City Operations, improving efficiency of municipal services and promoting a better quality of life for residents. In order to achieve these objectives, Agartala Smart City Limited desires to foster the development of a robust ICT infrastructure that supports digital applications and ensures seamless oversight of city-wide operations through Integrated Command and Control Centre, improved Integrated Traffic Management System, Surveillance, Vehicle Location for city Buses and AMC vehicles, Emergency response mechanisms and real time tracking of services and vital city metrics throughout the city and in government departments.

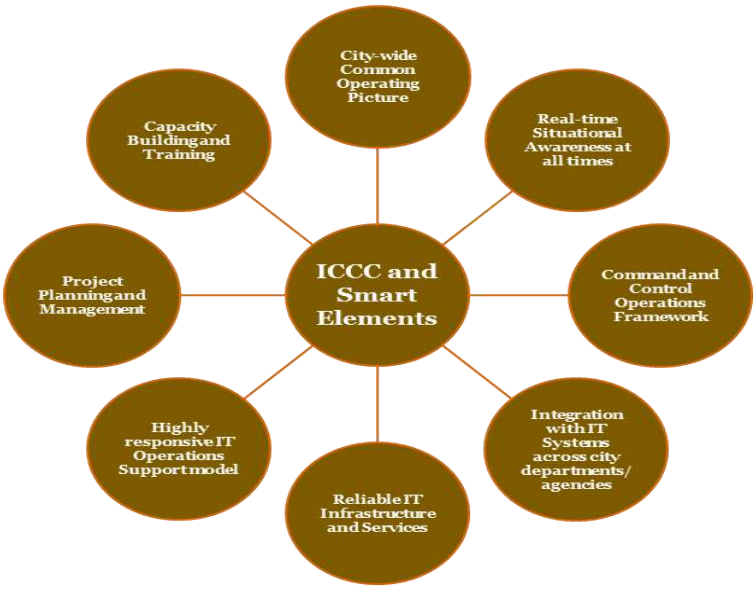


Figure -1: ICCC and its Components

The key objective of this project is to establish a collaborative framework where input from different functional departments of Agartala Municipal Corporation and other stakeholders such as transport, water, fire, police, e-governance, etc. can be assimilated and analyzed on a single platform; consequently resulting in aggregated city level information. Further, this can be converted to actionable intelligence, which would be propagated to relevant stakeholders and citizens.

The geographical coverage of the project has been divided in two categories as mentioned below:

1. **ICCC for Pan City Area from Smart City perspective**

   ICCC for Pan City area will enable collation of information and collaborative monitoring, thus helping in the analysis of data for quicker decision making. Intelligent operations capability ensures integrated data visualization, real-time collaboration and deep analytics that can help different stakeholders prepare for exigencies, coordinate and manage response efforts, and

enhance the ongoing efficiency of city operations. The ICCC user interface gives a real-time and unified view of operations. Cities can share information across agency lines in real-time to accelerate problem response and improve project coordination. Furthermore, the ICCC will help in anticipating the challenges and minimizing the impact of disruptions.

2. Smart Mobility solution for the citizens of Agartala

The vision of this project is to implement holistic and integrated traffic and transportation system in the city thereby providing citizens with seamless, safe and convenient public transport system along with centrally controlled traffic system

Following are the intangibles that should be addressed by the proposed interventions:

1. **Real-Time Monitoring**: Enable real-time monitoring of the various facets of management of Agartala Smart City i.e. Security, Traffic and City Utilities.
2. **Increased Traffic Efficiency:** Reduction in stoppage time, optimized cycle times of intersection to regulate and maintain free-flow of traffic to optimally utilize the road & transport infrastructure.
3. **Increased Travel Speed:** Intelligent Signals will reduce vehicle congestion on roads based on optimized signaling and thus increase the travel speed.
4. **Increase Operational Efficiency:** City Authorities intend to spend more time on public-facing functions. Thus, Information technology solutions should help in reducing the repetitive paperwork/records and making back-office functions more efficient.
5. **Improve Traffic Services:** The traffic services to public can be improved through user-friendly presentation of the various traffic information in real-time. Disabled-friendly traffic signals should help in providing convenient services to disabled citizens of the city.
6. **Safe and Convinient Public Transport:** Agartala Smart City intends to locate every AMC buses, Rickshaws, AMC vehicles through GPS/GPRS/LoRa based technologies. This will help in increasing accountability thereby leading to improvded efficiency. Vehicle Location will also provide citizens with a sense of safety
7. **Safety Improvement:** The real-time traffic monitoring and intelligent traffic control can prevent accidents by recognizing and thus responding to the potentially dangerous situation in advance.
8. **Higher Productivity:** Achieving improvement in the productivity, logistics and other economic activities by obtaining the precise information on transport due to the availability of data on traffic flow in key areas of the city.
9. **Real-time Information & Response:** The real-time information at the ICCC shall enable the operator to take necessary actions based on the real-time information and execute the required responses such as sending an emergency vehicle to the spot, arranging alternate route to VIP convoys, diverting the traffic to different routes etc. It shall be possible to track a particular event using the cameras installed at the traffic junction.

10. **Creating awareness and Education of public:** Through variable message sighboards, awareness on road traffic rules and safe driving precautions shall be imparted to road users.
11. **Enforcement:** Effective enforcement of traffic violation, checking and monitoring shall reduce the traffic related offences like Red Light violation, Stop line violations etc.
12. **Reduction in Social Cost:** The overall social cost can be saved by easing the traffic congestion by utilizing the optimally allocated real-time traffic information
13. **Create a platform for sharing traffic information across the city:** There is a critical need to create a platform for sharing traffic related information among traffic police and citizens in order to increase the effectiveness of Integrated Traffic Management System.
14. **Pollution Control:** To reduce pollution with a cleaner Air in the city due to reduced congestion
15. **Security and Safety:** Live Surveillance through a network of CCTV Cameras will help to view, and provide live alerts in case of events and incidents.
16. **Effective & Preventive Policing:** The technological interventions proposed for traffic regulation enforcement and CCTV coverage will enable quick tapping of issues in the form of data and maps such as crime mapping, blind spots, accidental zones, peak hour traffic count, average travel time, etc. This will enable the police department to reduce crime and do preventive policing.
17. **Guide Data-driven Planning**: Enabling intelligent decision makings using data, including real–time status applications and historical analytics reports leading to improved, data driven planning. It will also provide a database for city planning and development of future traffic strategies.
18. Provide capability to respond in a unified manner to situations on ground (both day to day and emergency situations) by creating a common operational picture for the relevant stakeholder
19. Provide and manage touch points from all concerned stakeholders during the lifecycle of various incidents
20. Define and manage the Key Performance Indicators (KPIs) for various operational aspects of the City Management
21. Provide capability to conduct analysis for continuous improvement of city operations
22. Better management of utilities and quantification of services
23. Disaster Management and Emergency Response System
24. Asset Management

4. Project Components

4.1. Components & Services Overview

A. Physical City ICCC:

Agartala smart city has to implement, integrate and operationalize all the smart solutions/ components of the city. These smart ICT solutions like Integrated Traffic Management System, Rapid Transit System, Smart Bus Shelter, PIS, VMS, City Surveillance, etc. have to be implemented by MSI to be selected through this RFP. Establishing the physical build of City command center with Video wall, local video storage, networking components etc. will also be responsibility of MSI.

ASCL intends to select a Master System Integrator (MSI) for city of Agartala by following competitive bidding process to design, develop, implement and maintain the Smart City System for a period of five years on turnkey basis. This document contains the following details:

- Scope of work that will be assigned to the MSI as part of this project
- Other terms and conditions of the envisaged Smart City System

B. City Operation/IoT Platform

The city operation platform will be at the cloud and design, implementation and maintenance of the operation platform will be under the scope of MSI. MSI will work on integrating different components and services with the operation platform. The platform should have capability of integrating different field level devices in order to support IoT ecosystem.

C. Data Center/ Data Recovery

1. The infrastructure of Data Center for ICCC, Integrated Traffic Management System, City Surveillance system, Automatic vehicle Management System shall be hosted in the State Data Centre. The following services shall be provisioned by DC
    a. Internet Bandwidth
    b. Hosting Space
    c. Power & Cooling
    d. Secured Data Center Environment
2. The MSI need to do the sizing of rack space required at facilities based on its capacity planning and sizing for the entire duration of the contract with adequate space for future expansion.
3. The infrastructure of Data Recovery shall also be hosted at Data Recovery Cloud.

MSI will establish Integrated Command and Control center for Agartala comprising of various project modules/ components mentioned below:

D. Level 1: Implement, Integrate, Command, Control and Fully Operate

Following components will be implemented as a part of this project.

1. Integrated Traffic Management System

2. Rapid Transit Management System (AVLS/ETM). AVLS for AMC vehicles such as Garbage Collectors, Auto Rickshow, Government Ambulances etc.
3. PIS for Smart Bus Shelters
4. Variable Message Display
5. City Surveillance System with PAS and ECB
6. Automatic Number Plate Recgnition System
7. Intelligent Pole
8. City Wide Wi-Fi
9. Digital Information Kiosk
10. Integrated Control and Command Centre
11. Data Centre

Following table describes all the solutions to be integrated phase wise and layer wise:

Sl. No	System Description	Implementation	Integration
1	Vehicle Tracking System/ AVLS	√	√
	Passenger Information System	√	√
	Electronic Ticketing Machine	√	√
3	Integrated Traffic management System	√	√
4	Automatic Vehicle Location for AMC Ambulances	√	√
5	Automatic Vehicle Location for Autorickshaw	√	√
6	Surveillance System – Police and Traffic	√	√
7	Variable Message Display	√	√
8	PAS/ECB	√	√
9	Digital Information Kiosk	√	√
10	Integrated Command and Control Centre	√	×

11	Intelligent Pole	√	√
12	Wifi Hotspots	√	√
13	Integration of SWM garbage collector with ICCC	×	√
14	Any other sensors/systems/services*	×	√

*These other services will be additional work and will be taken up as "Change request".

MSI shall be responsible to carry out the detailed survey prior to submission of bid for the complete solution component requirement in order to finalize infrastructure requirement, network bandwidth requirement, operational & administrative challenges etc.

The subsequent sections detail out the solution and scope with respect to each of the solution component. MSI shall note that the activities defined within scope of work mentioned are indicative and may not be exhaustive. MSI is expected to perform independent analysis of any additional work that may be required to be carried out to fulfil the requirements as mentioned in this RFP and factor the same in its response.

The scope of the project includes implementation of identified smart ICT solutions including establishment of city based Integrated Command and Control Center integrated with other implemented ICT solutions. Scope also includes conducting a detailed assessment of current state of city services being provided and accordingly plan, design a comprehensive technical architecture of city Integrated Command and Control Center (ICCC) and integrated it other components so that relevant current and future ICT project may be integrated with ICCC.

As part of scope the MSI is expected to integrate various other ICT initiatives of the city with ICCC. These ICT initiatives may be from other departments' services like Traffic, Police, and Transport etc. The MSI shall have the overall responsibility to design, build, implement, operate, and maintain the project for a period of five years from the date of successful commissioning.

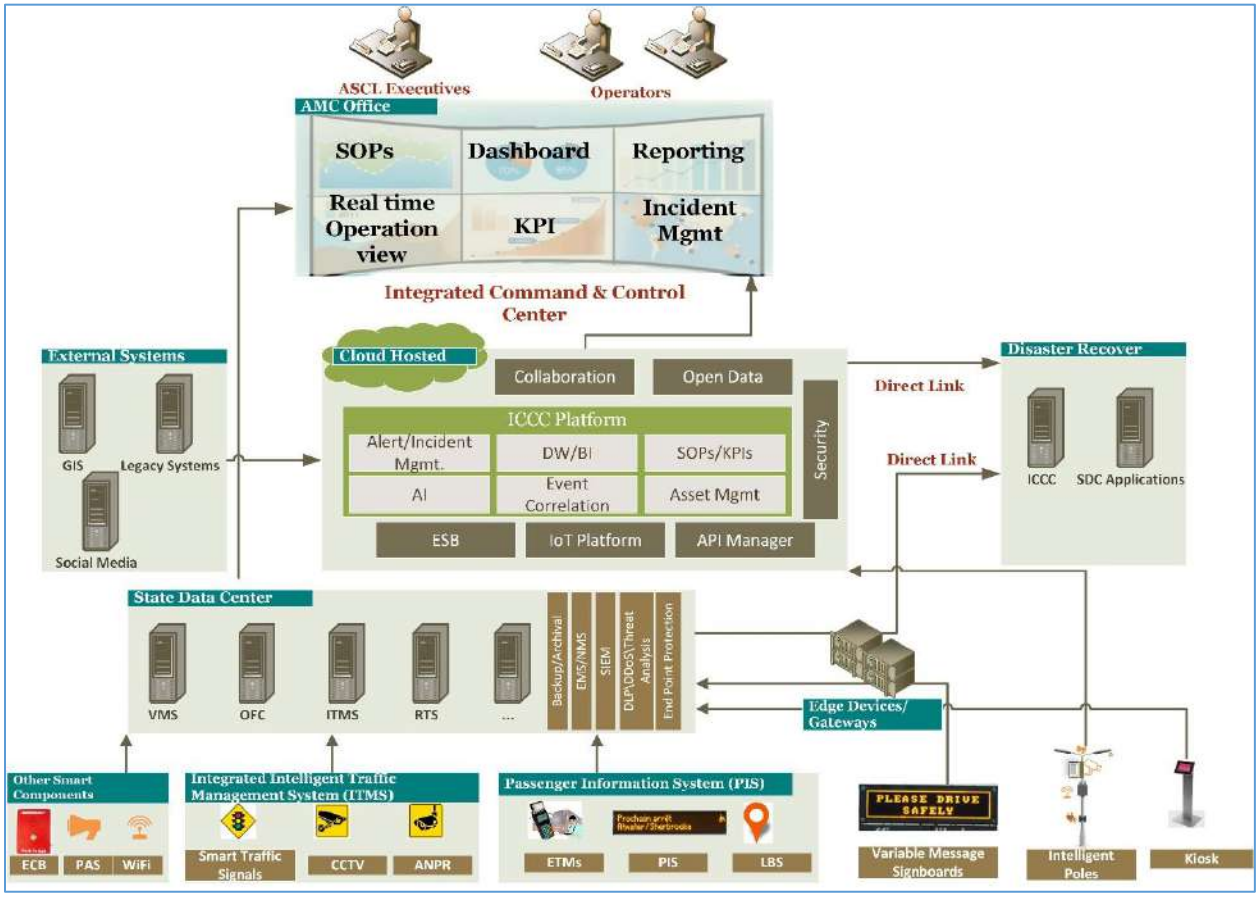
Specifically, Following are the main activities to be carried out by MSI:

1. Project Planning, execution and Management
2. Assessment and Gap analysis of requirement for all smart city components under scope.
3. Solution Design, System Customization and development for all components mentioned in this volume.
4. ICT items Procurement, deployment and commissioning
5. Site Preparation including required civil work, LAN Networking
6. Application and general awareness Training
7. Business Process Reengineering for the selected applications/ services, if required
8. STQC Certification

9. UAT & Go live
10. Capacity Building
11. Technical Support
12. Operation & Maintenance (O&M) for 5 Years.

4.2. Solution Architecture

The indicative solution architecture of ICCC and associated system components envisaged is as given below:



a. Field Devices

The field devices layer will contain display devices or bi-directional (input & output) devices connected to the network which will be used by citizens to consume - and for administrators to provide - actionable information. Such field devices include digital messaging boards, environmental data displays, etc.

This would also comprise of the sensors which will help the city administration gather information about the ambient city conditions or capture information from the edge level devices like cameras, environment sensors, GPS sensors, etc.

b. Data Center & Security

As ambient conditions, actuators and display devices are now connected through a network and send data to business applications, security of the entire system becomes paramount:

- Infrastructure security- including policies for identity and information security policies
- Network security- including policies and practices adopted to prevent and monitor unauthorized access, misuse, modification, or denial of a computer network and network-accessible resources, etc.
- Identity and Access Management – including user authentication, authorization, SSL & Digital Signatures
- Application security- including Hosting of Government Websites and other Cloud based services, Adoption of Technical Standards for Interoperability Framework and other standards published by Government of India for various e-Governance applications
- End device security, including physical security of all end devices such as display boards, emergency boxes, kiosks etc.

Following security parameters should be included for all smart elements, but not limited to:

- User/administrator audit log activity (logon, user creation, date-time of PA announcements, voice recording etc.)
- Secured data storage (storage of video/image/voice/location/data captured by various smart elements)
- SSL/TLS encryption for web and mobile application based interfaces for sensitive data transfer
- Protection against Denial of Service (DoS) and Interference attacks to public Wi-Fi Devices

c. Network

The secured networkbwill serve as the backbone for the project and provide connectivity to gather data from sensors, share the data with business applications and transmit messages to display devices and actuators. It will support the Wi-Fi services and other smart elements (sensors and displays) at given locations. The network will be scalable such that additional sensors, actuators, display devices can be seamlessly added and more Wi-Fi spots created in future.

d. Enterprise Computing

The business applications will need the appropriate hosting infrastructure considering their criticality to deliver services. The IT Infrastructure required for hosting will include Storage, Compute and Processing capabilities that are aligned with the non-functional requirements for the business applications.

e. Applications

The Applications will contain data aggregation and management systems (rules engines, alerting systems, diagnostics systems, control systems, messaging system, events handling system), and reporting / dashboard system to provide actionable information to city administrators and citizens. Applications would comprise of the applications developed to receive data from field devices for each city domain. Applications in this layer will integrate with the ICCC solution to share data and also generate advanced analytics through correlations. This will be an evolving layer with applications added as and when new functions are identified by the stakeholders.

f. Integration

While aspects of ambient conditions within the city will be gathered through various sensors deployed, some city specific data will come from other government and non-government agencies. It is through the integration layer – that data will be exchanged to and from the under lying architecture components and other data from system developed by government (such as police department, street lights department, water department transport organizations within Agartala, etc.) and non-government agencies. The various integrations have been listed below:

1) Street Lighting
2) ITMS
3) Vehicle Tracking System
4) City Surveillance System
5) Digital Kiosk
6) PIS
7) GIS
8) e-Governance Applications & City Wide App
9) VMD
10) ECB/PAS
11) Wi-Fi
12) SWM Garbage Collector
13) ICT components at Poles
14) Emergency Response and Disaster Mgmt.

g. Presentation

There will be two modes of presentation to the users accessing the ICCC system –

1) **Mobile UI** – Mobile based UI shall be for the senior management officials who would be accessing the system for very quick and faster flow of information exchange. This would cover less of the functions of the system as it would be largely designed for accessing by the senior management. Also it should provide field workforce app. which should have capability to assign task, task prioritization, route planning etc. Also field workforce can raise issues, get task assigned, provide status update etc. using this app.

2) **Web-based UI** – Web-based UI for the other officials who would be accessing the system for the information required for their respective departments

h. Integrated Command and Control Center

This is the overarching layer that integrates with the business applications that receive data from field devices. The Integrated Command and Control Centre application presents a Common Operating Picture which will enable citizens and administrators alike to get a holistic view of city operations. The application will integrate with the GIS layer to represent the real-time operational state on the map for easy visualization.

5. Scope of Services

5.1. Geographical Scope of services

The following is a summary of the geographical extent of the project.

#	System Description	Locations
1.	Intelligent Traffic Signals	23 Junctions
2.	Surveillance System (Fixed and PTZ Cameras)	131 Locations
3.	ANPR Cameras	12 Locations
4.	Red Light Violation Detection System at Intersection	23 Junctions
5.	Variable Message Display (VMD) Boards	18 Locations
6.	Passenger Information System (PIS) for Bus Shelters	48 Locations
7.	AVLS system for TRTC Buses	173 buses
8.	AVLS for Auto Rickshaws	8000
9.	AVLS for AMC vehicles (Such as Garbage Collectors, Ambulances, etc.)	7 AMC Ambulances
10.	Data Center (DC)	DC at State Data Centre
11.	Data Recovery (DR) Center	DR Cloud
12.	City Operation/IoT Platform	Cloud hosted
13.	Integrated Command & Control Center (ICCC)	ICCC at Agartala Municipal Corporation

The Indicative list of locations to be covered under this project are provided as Annexure IX.

5.2. Overview of Scope of Services

The MSI's scope of work shall include but will not be limited to the following broad areas. Details of each of these broad areas have also been outlined in Annexure II.

1. **Assessment, Scoping and Survey Study: Conduct a detailed assessment, scoping study and develop a comprehensive project plan, including:**
    a. Assess existing systems, street infrastructure and connectivity within the city for the scope items mentioned in section 4.1
    b. Conduct site survey for finalization of detailed technical architecture, gap analysis and project plan
    c. Conduct site surveys to identify need for site preparation activities
    d. Obtain site Clearance obligations & other relevant permissions
2. **Design, Supply, Installation, Commissioning and Testing which includes the following components:**
    a. Integrated Traffic Management System

b. Rapid Transit Management System (AVLS/ETM). AVLS for AMC vehicles such as Garbage Collectors, Auto Rickshow, Government Ambulances etc.

c. PIS for Smart Bus Shelters

d. Variable Message Display

e. City Surveillance System with PAS and ECB

f. Automatic Number Plate Recgnition System

g. Intelligent Pole

h. City Wide Wi-Fi

i. Digital Information Kiosk

j. Integrated Control and Command Centre

k. Data Centre

3. **Operation and Maintenance Phase:** The selected vendor will also be responsible for supply of IT solution for the management of hardware and application software, networking, installation, Training, Maintenance and operations of the solution for the period of 5 years from the Go Live date (after 6 months) (Refer Section 7), the O&M period will commence after Go-Live and will be for a period of 5 years. Warranty period of the product supplied under project i.e. hardware, software, IT/Non-IT etc., will be considered after Go-Live.

4. Integration with provisions available for Network Connectivity within the city which includes:

   a. Existing Fibre Optic Network (if available)

   b. Internet connectivity procured as part of this tender

5. Provisioning Hardware and Software Infrastructure which includes design, supply, installation, and commissioning of Cloud Platform, IT Infrastructure at Data Center (DC), Data Recovery Center (DRC), Integrated Command & Control Center (ICCC). This consist of:

   a. Basic Site preparation services

   b. IT Infrastructure including server, storage, other required hardware, application portfolio, licenses

   c. Command Center infrastructure including operator workstations, IP phones, joystick controller etc.

   d. Establishment of LAN and WAN connectivity between cloud, command center, DC and DR limited to scope of infrastructure procured for the project

6. Phase wise Integration of the ICT systems with Integrated Command & Control Center (ICCC):

   a. Integrated Traffic Management System

   b. Transit Management System for City Buses

c. City Surveillance System
d. Panic Button/Emergency Call Box
e. Public Address System
f. Smart Poles
g. City Network
h. City Wifi
i. Disaster Management
j. Grievance Management
k. Geographical Information System
l. Digital Information Kiosk
m. Any other sensors/systems

7. Capacity Building for ASCL and other end user department which includes preparation of operational manuals, training documents and capacity building support, including:

a. Training of the city authorities, police personnel and operators on operationalization of the system
b. Support during execution of acceptance testing
c. Preparation and implementation of the information security policy, including policies on backup and redundancy plan
d. Preparation of KPIs for performance monitoring of various urban utilities monitored through the system envisaged to be implemented
e. Developing standard operating procedures for operations management and other services to be rendered by ICCC

8. Preparation of system documents, user manuals, performance manuals, Operation manual etc.

9. Identification of Revenue generation opportunities by various smart solutions, planning and roll out of strategy

10. Operations and Maintenance services for the software, hardware and other IT and Non-IT infrastructure installed as part of the project after Go-Live and for a period of 5 years from the date of Go-Live. Five years of warranty period of the product supplied under project i.e hardware, software, IT/Non-IT etc., will be initiated/considered after Go-Live only.

5.3. Assessment and Site Survey & Project Plan

After signing of contract, the MSI needs to deploy local team (based out of Agartala) proposed for the project and ensure that a Project Inception Report is submitted to ASCL which should cover following aspects:

1. Names of the Project Team members, their roles and responsibilities
2. Approach and methodology to be adopted to implement the Project (which should be in line with what has been proposed during bidding stage, but may have value additions / learning in the interest of the project).
3. Responsibility matrix for all stakeholders
4. Risks the MSI anticipates and the plans they have towards their mitigation
5. Detailed project plan specifying dependencies between various project activities / sub-activities and their timelines
6. The MSI shall conduct a comprehensive As-Is study of the existing infrastructure of Traffic Junctions, Locations of Public Wi-Fi Hot Spots, CCTV camera locations to establish the key performance indicators (KPIs) for the project. The KPIs of the study shall be included in the survey.
7. The MSI shall study the existing business processes, functionalities, existing management systems and applications including MIS reporting requirements.

Additionally, the MSI should provide detailed designs specifying the following:

1. High Level Design (including but not limited to) Application architecture, Logical and physical database design, Data dictionary and data definitions, ER diagrams and other data modelling documents and Physical infrastructure design for devices on the field
2. Concept of Operations for the TO-BE state that covers – Layout of the ICCC, Staffing Requirements, Standard Operating Procedures, Operations Model for 24/7 coverage, Roles and Responsibilities
3. Application component design including component deployment views, control flows, etc.
4. Low Level Design (including but not limited to) Application flows and logic including pseudo code, GUI design (screen design, navigation, etc.), Database architecture, including defining data structure, data dictionary as per standards laid-down by Government of India/ Government of Tripura
5. Location of all field systems and components proposed at the junctions, (KML /KMZ file plotted on GIS platform like google earth etc.)
6. Location of Network Provider's Point of Presence (PoP)
7. Design of Cables, Ducts routing, digging and trenching
8. Electrical power provisioning.

9. **Open Standards -** System should use open standards and protocols to the extent possible without compromising on the security
10. **Convergence** - ASCL has already initiated many projects which have state of the art infrastructure at field locations deployed under them. Under the smart city program, ASCL has envisaged to create a state of the art infrastructure and services for the citizens of Agartala, hence it is imperative that all infrastructure created under the project shall be leveraged for maximum utilization. Hence the MSI is required to ensure that such infrastructure will allow for accommodation of equipment's being procured under other smart city projects. The procedure for utilization of the infrastructure will be mutually agreed between the ASCL and MSI
11. Sub-contracting / Outsourcing shall be allowed only for the work which is allowed as mentioned in this clause with prior written approval of ASCL. However, even if the work is sub-contracted / outsourced, the sole responsibility of the work shall lie with the MSI. The MSI shall be held responsible for any delay/error/non-compliance etc. of its sub-contracted vendor. The details of the sub-contracting agreements (if any) between both the parties would be required to be submitted to ASCL. Sub-contracting / outsourcing would be allowed only for work such as:

    I. Field Surveys required for the projects in scope

    II. Passive Networking & Civil Work during implementation,

    III. FMS staff for non- IT support during post-implementation

5.4. Finalization of Detailed Technical Architecture

The MSI shall also identify the customizations/ workaround that would be required for successful implementation and operation of the ICCC project. The MSI shall submit the detailed Technical Architecture, which should take into consideration following guiding principles:

1. **Scalability -** Important technical components of the architecture must support scalability to provide continuous growth to meet the growing demand of the city. The system should also support vertical and horizontal scalability so that depending on changing requirements from time to time, the system may be scaled upwards. There must not be any system imposed restrictions on the upward scalability in number of cameras, data centre equipment or other smart city components. Main technology components requiring scalability are storage, bandwidth, computing performance (IT Infrastructure).

    The architecture should be scalable (cater to increasing load of internal and external users and their transactions) and capable of delivering high performance till the system is operational. In this context, it is required that the application and deployment architecture should provide for Scale-Up and Scale out on the Application and Web Servers, Database Servers and all other solution components. The data centre infrastructure shall be capable of serving the growing concurrent users requirement which would be increasing as the city would grow.

2. **Availability** - The architecture components should be redundant and ensure that are no single point of failures in the key solution components. Considering the high sensitivity of the system, design should be in such a way as to be resilient to technology sabotage. To take care of remote failure, the systems need to be configured to mask and recover with minimum outage. The MSI shall make the provision for high availability for all the services of the system. Redundancy has to be considered at the core / data center components level.

3. **Security** - The architecture must adopt an end-to-end security model that protects data and the infrastructure from malicious attacks, theft, natural disasters etc. MSI must make provisions for security of field equipment as well as protection of the software system from hackers and other threats. Using Firewalls and Intrusion Prevention Systems such attacks and theft should be controlled and well supported (and implemented) with the security policy. The virus and worm attacks should be well defended with gateway level Anti-virus system, along with workstation level Anti-virus mechanism. There should also be an endeavour to make use of the SSL/VPN technologies to have secured communication between Applications and its end users. Furthermore, all the system logs should be properly stored & archived for future analysis and forensics whenever desired. ASCL would carry out the security audit of the entire system upon handover and also at regular interval during O&M period. Bidder's solution shall adhere to the model framework of cyber security requirements set for Smart City (K-15016/61/2016-SC-1, Government of India, and Ministry of Urban Development).

   Field equipment installed through the ICCC project would become an important public asset. During the contract period of the Project the MSI shall be required to repair / replace any equipment if stolen / damaged/faulty. Appropriate insurance cover must be provided to all the equipments supplied under this project.

   The systems implemented for project should be highly secure, considering that it is intended to handle sensitive data relating to the city and residents of the city. The overarching security considerations are described below:

   a. The security services used to protect the solution shall include: Identification, Authentication, Access Control, Administration and Audit and support for industry standard protocols.

   b. The solution shall support advanced user authentication mechanisms including digital certificates and biometric authentication.

   c. Security design should provide for a well-designed identity management system, security of physical and digital assets, data and network security, backup and recovery and disaster recovery system.

   d. The solution should provide for maintaining an audit trail of all the transactions and should also ensure the non-repudiation of audit trail without impacting the overall performance of the system.

   e. The overarching requirement is the need to comply with ISO 27001 standards of security.

f. The application design and development should comply with OWASP top 10 principles

4. **Manageability** - Ease of configuration, ongoing health monitoring, and failure detection are vital to the goals of scalability, availability, and security and must be able to match the growth of the environment. Network should be auto/manual configurable for various future requirements for the ease of maintenance / debugging.

5. **Interoperability** - The system should have capability to take feed from cameras installed by private / Govt. at public places, digitize (if required) & compress (if required) this feed & store as per requirements.

6. **Open Standards** - Systems should use open standards and protocols. Keeping in view the evolving needs of interoperability, especially the possibility that the solution shall become the focal point of delivery of services, and may also involve cross-functionality with the e-Government projects of other departments / businesses in future, the solution should be built on Open Standards. The MSI shall ensure that the application developed is easily integrated with the existing applications. The code does not build a dependency on any proprietary software, particularly, through the use of proprietary 'stored procedures' belonging to a specific database product. The standards should at least comply with the published eGovernance standards, frameworks, policies and guidelines available on http://egovstandards.gov.in (updated from time-to-time)

7. **Single-Sign On-** The application should enable single-sign-on so that any user once authenticated and authorized by system is not required to be re-authorized for completing any of the services in the same session. For employees of the department concerned, the browser based application accessed on the intranet, through single-sign-on mechanism, will provide access to all the services of the departments concerned (based on their roles and responsibilities), Help module, basic and advanced reporting etc. Similarly, for external users (citizens, etc), based on their profile and registration, the system shall enable single-sign on facility to apply for various services, make payments, submit queries /complaints and check status of their applications.

8. **Support for PKI-based Authentication and Authorization**- The solution shall support PKI based Authentication and Authorization, in accordance with IT Act 2000, using the Digital Certificates issued by the Certifying Authorities (CA). In particular, 3 factor authentications (login id & password, biometric and digital signature) shall be implemented by the MSI for officials/employees involved in processing citizen services.

9. **Convergence** - ASCL has already initiated many projects which have state of the art infrastructure at field locations deployed under them. The ICCC Infrastructure should be made scalable for future convergence needs. Under the smart city program, ASCL has envisaged to create a state of the art infrastructure and services for the citizens of Agartala, hence it is imperative that all infrastructure created under the project shall be leveraged for maximum utilization. Hence the MSI is required to ensure that such infrastructure will allow for accommodation of equipment's being procured under other smart city projects. Equipment like Junction Boxes and poles deployed under the ICCC project at the field locations will be utilized

to accommodate field equipment's created under the other projects of ASCL. The procedure for utilization of the infrastructure will be mutually agreed between the ASCL and Master System Integrator.

10. All the personnel working on the Project and having access to the Servers / Data Center should be on direct payroll of the MSI/OEM/Consortium partner. The MSI would not be allowed to sub-contract work, except for following:

    a. Passive networking & civil work during implementation and O&M period,

    b. Viewing manpower at ICCC during post-implementation

    c. FMS staff for non- IT support during post-implementation

    d. Services of professional architect for design of ICCC

    However, even if the work is sub-contracted , the sole responsibility of the work shall lie with the MSI. The MSI shall be held responsible for any delay/error/non-compliance/penalties etc. of its sub-contracted vendor. The details of the sub-contracting agreements (if any) between both the parties would be required to be submitted to ASCL and approved by the ASCL before resource mobilisation.

11. **GIS Integration**- MSI shall undertake detail assessment for integration of the e-Governance, Surveillance System and all other components with the Geographical Information System (GIS). MSI is required to carry out the seamless integration to ensure ease of use of GIS in the Dashboards in ICCC. If this requires field survey, it needs to be done by MSI. If such a data is already available with city, it shall facilitate to provide the same. MSI is to check the availability of such data and it's suitability for the project. MSI is required to update GIS maps from time to time.

12. **SMS Gateway Integration**- MSI shall carry out SMS Integration with the Smart City System and develop necessary applications to send mass SMS to groups/individuals. Any external/third party SMS gateway can be used, but this needs to be specified in the Technical Bid, and approved during Bid evaluation.

13. **Application Architecture**

    a. The applications designed and developed for the departments concerned must follow best practice and industry standards. In order to achieve the high level of stability and robustness of the application, the system development life cycle must be carried out using the industry standard best practices and adopting the security constraints for access and control rights. The various modules / application should have a common Exception Manager to handle any kind of exception arising due to internal/ external factors. The standards should at least comply with the published eGovernance standards, frameworks, policies and guidelines available on http://egovstandards.gov.in (updated from time-to-time)

    b. The modules of the application are to be supported by the Session and Transaction Manager for the completeness of the request and response of the client request. The system should

have a module exclusively to record the activities/ create the log of activities happening within the system / application to avoid any kind of irregularities within the system by any User / Application.

c. MSI shall design and develop the ICCC System as per the Functional and System requirement specifications finalized.

i. The Modules specified will be developed afresh based on approved requirement.

ii. Apart from this, if some services are already developed/under development phase by the specific department, such services will be integrated with the ICCC System. These service will be processed through department specific Application in backend.

iii. The user of citizen services should be given a choice to interact with the system in local language in addition to English. The application should provision for uniform user experience across the multi lingual functionality covering following aspects:

- Front end web portal in English and local language
- E-forms (Labels & Data entry in local languages). Data entry should be provided preferably using the Enhanced Inscript standard (based on Unicode version 6.0 or later) keyboard layout with option for floating keyboard.
- Storage of entered data in local language using UNICODE (version 6.0 or later) encoding standard.
- Retrieval & display in local language across all user interfaces, forms and reports with all browsers compliant with Unicode version 6.0 and above.
- Facility for bilingual printing (English and the local language)

iv. Application should have a generic workflow engine for citizen centric services. This generic workflow engine will allow easy creation of workflow for new services. At the minimum, the workflow engine should have the following features:

- Feature to use the master data for the auto-populating the forms and dropdowns
- Creation of application form, by “drag & drop” feature using meta data standards
  - Defining the workflow for the approval of the form
  - First in First out
  - Defining a citizen charter/delivery of service in a time bound manner
- Creation of the “output” of the service, i.e. Certificate, Order etc.
- Automatic reports
  - of compliance to citizen charter on delivery of services
  - delay reports

d. The standards should at least comply with the published eGovernance standards, frameworks, policies and guidelines available on http://egovstandards.gov.in (updated from time-to-time).

e. The application should have a module for management of digital signature including issuance, renewal and suspension of digital signatures based on the administrative decisions taken by the State.

f. MSI shall ensure using Digital signatures/eAuthentication(Aadhar Based) to authenticate approvals of service requests etc.

i. e-Transaction & SLA Monitoring Tools

- The MSI should be able to measure and monitor the performance of the deployed infrastructure and all SLAs set out in this RFP. More importantly, it should be possible to monitor in REALTIME, the number of citizens touched through e-Services each day, month and year, through appropriate tools and MIS reports.
- The Infrastructure management and Monitoring System shall be used by MSI to monitor the infrastructure (Both IT and Non-IT) hosted at the Data center and DR site.
- For monitoring of uptime and performance of IT and non IT infrastructure deployed, the MSI shall have to provision for monitoring and measurement tools, licenses, etc. required for this purpose.

ii. The ICCC Application should have roadmap to integrate with key initiatives of State namely Portal Services, Citizen Contact Centre, Certifying Authority etc.

iii. Complete mobile enablement of the ICCC System

14. The functional requirements and technical specifications provided in this RFP are indicative and carry guiding rule. The MSI is free to offer products and solutions which meet requirements of the RFP focusing on the outcome, future scalability, security, reliability and adherence to specified SLA under this RFP, in line with applicable standards & best practices adopted in the industry. The MSI is encouraged to design an Optimised solution which is technically superior, innovative, proven, better in terms of functionality and is cost effective. Any specified parameters mentioned in the scope/technical requirement in the RFP may be considered if it is required for meeting current & future requirements during the contract period. The MSI is fully responsible for the specified outcome to be achieved.

5.5. Site Clearance obligations & other relevant permissions

5.5.1. Survey and Commencement of Works

Prior to starting the site clearance, the MSI shall carry out survey of field locations as specified in Annexure IX, for buildings, structures, fences, trees, existing installations, etc. The ASCL shall be fully informed of the results of the survey and the amount and extent of the demolition and site clearance shall then be agreed with the ASCL.

5.5.2. Existing Traffic Signal system

The infrastructure of existing 7 traffic signal systems including the aspects, controllers etc. will be dismantled and replaced with the new systems which are proposed and required under the scope of the ICCC project. The dismantled infrastructure shall be delivered at the ASCL designated location without damage at no extra cost.

5.5.3. Electrical works and power supply

The MSI shall directly interact with electricity boards for provision of mains power supply at select/permanent locations for ICCC field systems. The MSI shall be responsible to pay the electricity bills including connection charge, meter charge, recurring charges etc. to the electricity board directly. MSI shall have to submit the challan of bill submission to ASCL. ASCL will reimburse the amount submitted to the MSI after verification in next billing cycle.

5.5.4. Lightning-proof measures

The MSI shall comply with lightning-protection and anti–interference measures for system structure, equipment type selection, equipment earthing, power, signal cables laying. The MSI shall describe the planned lightning-protection and anti –interference measures in the As-Is report. Corresponding lightning arrester shall be erected for the entrance cables of power line, video line, data transmission cables. All crates shall have firm, durable shell. Shell shall have dustproof, antifouling, waterproof function & should capable to bear certain mechanical external force. Signal separation of low and high frequency; equipment's protective field shall be connected with its own public equal power bodies; small size/equipment signal lightning arrester shall be erected before the earthling. The Internal Surge Protection Device for Data Line Protection shall be selected as per zone of protection described in IEC 62305, 61643-11/12/21, 60364-4/5. Data line protection shall be used for security system, server data path and other communication equipment. Data line protection shall be installed as per zone defined in IEC 62305.Type 1 device shall be installed between zone 0B and zone 1. Type 2 devices shall be installed before the equipment in zone 2 and 3.

5.5.5. Earthing System

All electrical components are to be earthen by connecting two earth tapes from the frame of the component ring and will be connected via several earth electrodes. The cable arm will be earthen through the cable glands. The entire applicable IT infrastructure i.e field locations/traffic junctions or command centre shall have adequate earthing. Further, earthing should be done as per Local state national standard in relevance with IS standard.

1. Earthing should be done for the entire power system and provisioning should be there to earth UPS systems, Power distribution units, AC units, etc. so as to avoid a ground differential. ASCL shall provide the necessary space required to prepare the earthing pits.
2. All metallic objects on the premises that are likely to be energized by electric currents should be effectively grounded.
3. There should be enough space between data and power cabling and there should not be any cross wiring of the two, in order to avoid any interference, or corruption of data.
4. The earth connections shall be properly made.
5. A complete copper mesh earthing grid needs to be installed for the server farm area, every rack need to be connected to this earthing grid. A separate earthing pit needs to be in place for this copper mesh.
6. Provide separate Earthing pits for Servers, & UPS as per the standards.

5.5.6. Junction Box, Poles and Cantilever

1. The MSI shall provide the Junction Boxes, poles and cantilever to mount the field sensors like the cameras, traffic sensors, traffic light aspects, active network components, controller and UPS at all field locations, as per the specifications given in the RFP.
2. The Junction Box needs to be appropriately sized in-order to accommodate the systems envisaged at the Junctions
3. The Junction Box for UPS with Battery bank needs to be considered separately
4. It should be noted that the MSI would have designed the Junction box keeping in mind the scalability requirements of ICCC project
5. The junction box should be designed in a way that, separate compartment will be available for separate system (i.e. ITMS Controller, Mini server, Active component, etc.). Each compartment shall have lock & key facility. There should be provision made to integrate the systems if required.
6. At selected traffic junctions, the infrastructure of poles and cantilevers will be provided by the client for mounting/installing the traffic light aspects. The details of such traffic junctions/locations are provided in Annexure VIII**.**

5.5.7. Cabling Infrastructure

1. The MSI shall provide standardized cabling for all devices and subsystems in the field.
2. MSI shall ensure the installation of all necessary cables and connectors between the field sensors /devices assembly, outstation junction box, for pole mounted field sensors /devices the cables shall be routed down the inside of the pole and through underground duct to the outstation cabinet.
3. All cables shall be clearly labeled with indelible indications that can clearly be identified by maintenance personnel. The proposed cables shall meet the valid directives and standards.

4. Cabling must be carried out per relevant BIS standards. All cabling shall be documented in a cable plan by the MSI.

5.6. Design and Implementation of Integrated Command & Operation Center System

The MSI should ensure the successful implementation of the proposed ICCC Project as per the scope of services described below. MSI shall implement and deliver the following systems and capabilities linked ICCC.

1. Integrated Traffic Management System (ITMS)
2. Traffic Violation Detection System
3. Variable Message Display (VMD) boards
4. Surveillance System
5. Automatic Number Plate Recognition (ANPR) System
6. Passenger Information System for Bus Shelters
7. AVLS for city TRTC buses, Auto Rickshaws, AMC vehicles
8. Intelligent Pole
9. City Wide Wi-Fi
10. Digital Information Kiosk
11. Network Connectivity
12. Cloud platform for ICCC deployment
13. Data Center (DC)
14. Disaster Recovery Center (DRC)
15. Integrated Command & Operation Center (ICCC)

The functional requirements and technical specifications provided in the below sections and at other sections in this section are indicative and carry guiding rule. The MSI is free to offer products and solutions which meet requirements of the RFP focusing on the outcome, future scalability, security, reliability and adherence to specified SLA under this RFP, in line with applicable standards & best practices adopted in the industry. The MSI is encouraged to design an Optimised solution which is technically superior, innovative, proven, better in terms of functionality and is cost effective. Any specified parameters mentioned in the scope/technical requirement in the RFP may be considered if it is required for meeting current & future requirements during the contract period. The MSI is fully responsible for the specified outcome to be achieved.

5.6.1. Design, Supply, Installation & Commissioning of the Field Equipment

The Scope includes Supply, Installation, commissioning and Customization (as required) of various field systems which include Integrated Traffic Management System (ITMS) at Traffic Junctions, Surveillance System, ANPR Cameras, Variable Message Display (VMDs), Traffic Violation Detection system, Intelligent Poles, City Wide Wi-Fi, Transit Management System for city buses etc. and other IT infrastructure required for successful operations of the ICCC project.

Based on the approved Survey report, the MSI will undertake the system configuration and customization in line with the changed, improved or specific requirements of ASCL including:

1. The implementation methodology and approach must be based on the global best practices in-order to meet the defined Service Levels during the operation.
2. Best efforts have been made to define major functionalities for each sub- system of ICCC system. However, MSI should not limit its offerings to the functionalities proposed in this RFP and is suggested to propose any functionality over and above what has already been given in this tender.
3. The MSI shall design the field level equipment architecture to ensure maximum optimization of network equipment, poles, cantilever, mounting infrastructures, power supply equipment including, electric meters and junction box.
4. Finally approved/accepted solution for each component of ICCC project shall be accompanied with “System Configuration” document and the same should be referenced for installation of ICCC systems at Junctions/Locations that are identified within the scope of this project.
5. The MSI shall be required to submit a detailed installation report post installation of all the equipment at approved locations. The report shall be utilized during the acceptance testing period of the project to verify the actual quantity of the equipment supplied and commissioned under the project.
6. The MSI shall be responsible for obtaining all permits and approvals necessary to install the ICCC systems components as per the approved design.

The sub-systems included as part of the ICCC project which are required to be implemented and integrated are given in the subsequent sections.

5.6.1.1. Integrated Traffic Management System (ITMS)

The broad scope of work to be covered under ITMS sub module will include the following, but is not limited to:

1. Preparation of Solution Architecture as per project blueprint to develop a final BOQ for installation traffic signaling systems.
2. Installation of vehicle detectors, controllers, Traffic light aspects, poles, cantilevers, Junction Box and other required accessories at 23 traffic junctions for successful operation of the ITMS project for Agartala Smart City

3. Integration of ITMS field infrastructures with the proposed ITMS software application
4. Configuration of traffic signal at each of the junction along with development of signal control plan for individual operations, coordinated signal plan for the junction in sync with the area wide signal plan for different operating conditions. The operating conditions may include different peak and off-peak conditions, special events, contingency plans etc.
5. The MSI should design and propose energy saving signaling system by using solar powered signals or other advanced technologies.
6. The functional requirements and technical specifications provided in this RFP are indicative and carry guiding rule. The MSI is free to offer products and solutions which meet requirements of the RFP focusing on the outcome, future scalability, security, reliability and adherence to specified SLA under this RFP, in line with applicable standards & best practices adopted in the industry. The MSI is encouraged to design an Optimised solution which is technically superior, innovative, proven, better in terms of functionality and is cost effective. Any specified parameters mentioned in the scope/technical requirement in the RFP may be considered if it is required for meeting current & future requirements during the contract period. The MSI is fully responsible for the specified outcome to be achieved.
7. For more details on technical and functional specifications of ITMS, MSI should refer to Annexure I for Functional and Technical specifications.

5.6.1.2. Surveillance System

The broad scope of work to be covered under this sub module will include the following, but is not limited to:

1. The MSI shall install Surveillance System Cameras for CCTV monitoring and management at 131 locations across Agartala city.
2. Provision for Emergency Call Box and Public Address/Hooter System at identified locations
3. The MSI shall undertake due diligence for selection and placement of surveillance cameras to ensure the optimized coverage of the traffic junction and other locations along with all associated junction arms, accuracy of the information captured on the field and for rugged operations.
4. The MSI shall design, supply, and install the surveillance cameras as defined in the RFP; all wiring connections for the system shall be installed by the MSI. The MSI shall supply all of the necessary equipment for the camera operations including camera housings and mountings, camera poles, switches, cabling, and shall make the final connections to the junction box.
5. The MSI shall be responsible for providing the entire necessary IT infrastructure for monitoring, recording, storage & retrieval of the video streams at ICCC or any other location as specified in the RFP.
6. The functional requirements and technical specifications provided in this RFP are indicative and carry guiding rule. The MSI is free to offer products and solutions which meet

requirements of the RFP focusing on the outcome, future scalability, security, reliability and adherence to specified SLA under this RFP, in line with applicable standards & best practices adopted in the industry. The MSI is encouraged to design an Optimised solution which is technically superior, innovative, proven, better in terms of functionality and is cost effective. Any specified parameters mentioned in the scope/technical requirement in the RFP may be considered if it is required for meeting current & future requirements during the contract period. The MSI is fully responsible for the specified outcome to be achieved.

7. For more details on technical and functional specifications of Surveillance Cameras, MSI should refer to Annexure I for Functional and Technical specifications.

5.6.1.3. Traffic Violation Detection System

The broad scope of work to be covered under this sub module will include the following, but is not limited to:

1. The MSI shall install the Traffic Violation Detection System at 23 traffic junctions across the city. This system shall capture the infractions of Red light and stop line violations at these junctions.
2. The MSI shall design, supply, and install the Traffic Violation Detection System as defined in the RFPs, all wiring connections to the traffic signal controllers and to the camera platforms shall be installed by the MSI. The MSI shall supply all of the necessary equipment for the camera and detection system, including but not limited to: computers, ancillary camera equipment, camera housings, camera poles, warning signs and shall make the final connections to the camera.
3. The solution proposed by the MSI shall seamlessly integrate with the E-Challan system proposed under the scope of this project. ASCL shall facilitate to get access to the Vaahan and Sarathi database. Bidder shall be required to access the same through use of appropriate APIs.
4. The MSI shall be responsible for providing all the necessary IT infrastructure for analysis, storage & retrieval of the infraction information at ICCC or any other location as specified in the RFP.
5. The functional requirements and technical specifications provided in this RFP are indicative and carry guiding rule. The MSI is free to offer products and solutions which meet requirements of the RFP focusing on the outcome, future scalability, security, reliability and adherence to specified SLA under this RFP, in line with applicable standards & best practices adopted in the industry. The MSI is encouraged to design an Optimised solution which is technically superior, innovative, proven, better in terms of functionality and is cost effective. Any specified parameters mentioned in the scope/technical requirement in the RFP may be considered if it is required for meeting current & future requirements during the contract period. The MSI is fully responsible for the specified outcome to be achieved.
6. For more details on technical and functional specifications of Traffic Violation Detection system, MSI should refer to Annexure I for Functional and Technical specifications.

5.6.1.4. Variable Message Display (VMD) Boards

The broad scope of work to be covered under this sub module will include the following, but is not limited to:

1. The MSI shall install 23 IP based VMD boards (of two sizes) on approximate 18 locations across city of Agartala. These VMD boards shall have different characteristics depending upon the location and purpose of installation. VMD board displays are to be controlled through ICCC. The purpose of the VMD boards is to provide the commuters with information about traffic/congestion conditions and alternate routes/diversions in case of high traffic on roads.
2. The MSI, in consultation with AMC can propose alternate locations apart from the locations mentioned in this RFP for installing the VMD boards where their effectiveness in communicating information about traffic conditions/other informations in Agartala will be maximized.
3. AMC shall review and approve the proposed locations. The MSI shall install the VMD boards on the approved locations.
4. The functional requirements and technical specifications provided in this RFP are indicative and carry guiding rule. The MSI is free to offer products and solutions which meet requirements of the RFP focusing on the outcome, future scalability, security, reliability and adherence to specified SLA under this RFP, in line with applicable standards & best practices adopted in the industry. The MSI is encouraged to design an Optimised solution which is technically superior, innovative, proven, better in terms of functionality and is cost effective. Any specified parameters mentioned in the scope/technical requirement in the RFP may be considered if it is required for meeting current & future requirements during the contract period. The MSI is fully responsible for the specified outcome to be achieved.
5. For more details on technical and functional specifications of VMD boards, the MSI should refer to Annexure I for functional requirements and technical specifications.

5.6.1.5. ANPR Cameras

The broad scope of work to be covered under this sub module will include the following, but is not limited to:

1. The MSI shall install the ANPR Cameras at 12 junctions/locations across the city. This system shall automatically capture the license number plate of the vehicle at these junctions.
2. The MSI shall design, supply, and install the ANPR camera system as defined in the RFPs, all camera accessories such as IR Illuminators, camera housing and mounting shall be installed by the MSI. The MSI shall supply all of the necessary equipment for the camera and local processing system, including but not limited to: computers, local storage, and ancillary camera equipment, camera poles, warning signs and shall make the final connections to the camera.

3. The MSI shall be responsible for providing all the necessary IT infrastructure for detection, analysis, storage & retrieval of the number plate information at ICCC or any other location as specified in the RFP.
4. The functional requirements and technical specifications provided in this RFP are indicative and carry guiding rule. The MSI is free to offer products and solutions which meet requirements of the RFP focusing on the outcome, future scalability, security, reliability and adherence to specified SLA under this RFP, in line with applicable standards & best practices adopted in the industry. The MSI is encouraged to design an Optimised solution which is technically superior, innovative, proven, better in terms of functionality and is cost effective. Any specified parameters mentioned in the scope/technical requirement in the RFP may be considered if it is required for meeting current & future requirements during the contract period. The MSI is fully responsible for the specified outcome to be achieved.
5. For more details on technical and functional specifications of ANPR Cameras, MSI should refer to Annexure I for Functional and Technical specifications.

5.6.1.6. E-Challan Devices

The MSI is required to supply 23 devices for 23 junctions along with e-Challan application for spot challan issuance. The MSI is required to seamlessly integrate the handheld e-Challan application with the E-Challan system proposed under the scope of this project.

The functional requirements and technical specifications provided in this RFP are indicative and carry guiding rule. The MSI is free to offer products and solutions which meet requirements of the RFP focusing on the outcome, future scalability, security, reliability and adherence to specified SLA under this RFP, in line with applicable standards & best practices adopted in the industry. The MSI is encouraged to design an Optimised solution which is technically superior, innovative, proven, better in terms of functionality and is cost effective. Any specified parameters mentioned in the scope/technical requirement in the RFP may be considered if it is required for meeting current & future requirements during the contract period. The MSI is fully responsible for the specified outcome to be achieved.

5.6.1.7. Design & Implementation of Transit Management System for City buses & AMC Vechicles & Smart Bus Shelters

1. The following locations would be covered for Transit Management system for city buses & AMC Vechiles:

S. No.	System	Sub-System	Coverage
1.	Vehicle Tracking System	A. Vehicle Location System (GPRS/GSM/ LoRa Communication) for city buses	173 Buses
		B. Vehicle Location System for Auto Rickshaw	Approximately 8000 Nos.

S. No.	System	Sub-System	Coverage
		C. Vehicle Location System for Municipal/ Emergency Vehicles: ▪ Integration of SWM Vehicles/ Garbage Collector ▪ Government Ambulances	7 Ambulances
2.	Smart Bus Shelters	A. PIS at identified Bus Stops/ Bus Depots B. CCTV Camera C. ECB/Panic Buttons D. Small size VMDs	A. 45 Bus Stops/Shelters B. 3 Bus Depots
3.	Automatic fare Collection System Through ETMs	Electronic Ticketing System with Handheld Ticketing Machine scalable to Smart Card reading	350 Nos.

2. MSI shall be responsible for installation, integration, initialization and startup of the Hardware and software supplied as part of Transit Management System.
3. The functional requirements and technical specifications provided in this RFP are indicative and carry guiding rule. The MSI is free to offer products and solutions which meet requirements of the RFP focusing on the outcome, future scalability, security, reliability and adherence to specified SLA under this RFP, in line with applicable standards & best practices adopted in the industry. The MSI is encouraged to design an Optimised solution which is technically superior, innovative, proven, better in terms of functionality and is cost effective. Any specified parameters mentioned in the scope/technical requirement in the RFP may be considered if it is required for meeting current & future requirements during the contract period. The MSI is fully responsible for the specified outcome to be achieved.
4. For more details on technical and functional specifications of Transit Management System, the MSI should refer to Annexure I for functional requirements and technical specifications.

5.6.1.8. Design & Implementation of Intelligent Pole

The MSI shall be responsible for Installation of Intelligent Poles at below mentioned locations:

1. Main entrance zone of Secretariat Complex
2. Radhanagar Bus Stand Area
3. Chandrapur ISBT
4. Airport Approach Road
5. MBB college approach road
6. Entrance of Govt. Museum

The scope of the project for the Master System Integrator (MSI) shall be to:

1. Design, implement, maintain and solution as mentioned in the RFP
2. Provide the hardware and software required for a centralized view of intelligent poles
3. The components which will be hosted at the Intelligent Poles are as follows (this is indicative list and MSI is encouraged to come up with more components)
    a. Smart LEDs
    b. Surveillance
    c. Smart Billboards
    d. Environmental Sensors
    e. Wi-Fi
    f. SOS panic button on pole
    g. Flood Monitoring Sensors
4. Provide the backhaul network which acts as communication layer for real time data from sensors to reach data center.
5. Integration with ICCC
    a. The Intelligent Pole solution will be integrated with the Integrated Command and Control Center (ICCC) and provide real-time statistics and data along with control to the operators and other stakeholders in the ICCC.
    b. The functionalities at the poles should be controlled and operated through ICCC

The functional requirements and technical specifications provided in this RFP are indicative and carry guiding rule. The MSI is free to offer products and solutions which meet requirements of the RFP focusing on the outcome, future scalability, security, reliability and adherence to specified SLA under this RFP, in line with applicable standards & best practices adopted in the industry. The MSI is encouraged to design an Optimised solution which is technically superior, innovative, proven, better in terms of functionality and is cost effective. Any specified parameters mentioned in the scope/technical requirement in the RFP may be considered if it is required for meeting current & future requirements during the contract period. The MSI is fully responsible for the specified outcome to be achieved.

For more details on technical and functional specifications of Intelligent Pole solution, the MSI should refer to Annexure I for functional requirements and technical specifications.

5.6.1.9. Design & Implementation of City Wide Wi-Fi

The scope of work for the MSI will include establishment of Wi-Fi network at the selected location in the Agartala, these locations are normally tourist spots, public places or any other identified place by ASCL. Bidder shall provide Operation & Maintenance throughout the concession period from the date of commissioning. The broad scope of work for the Bidder during the entire project period would be as under.

The MSI will be responsible for design and implementation of following Wi-Fi system:

a. The Bidder Shall undertake a Site-survey of all the specified sites and submit a site wise survey report to ASCL mentioning the location &number of Access Points (APs) required to be installed at each site.

b. Bidder proposal must provide all the necessary electronic components needed to provide wireless access to the public. This includes but is not limited to Wireless controllers, Access points, Power over Ethernet devices, L2 and L3 managed switches, Routers, UPS, passive components i.e UTP, OFC, Electric wires, racks etc.

c. The Bidder shall install the Access Points at approved locations (on directions by ASCL after approval of Site-Survey report). The power points, connectivity and LAN points will be the responsibility of Bidder. ASCL will facilitate the requirement/clearances as and when required

d. Bidder shall properly Wall Mount/ Pole Mount the Access Points at approved locations with external mounting kit as per OEM standard practice.

e. The Bidder shall install the AP Controller, NMS, NAS and required software at Command & Control Center

f. The Patch Cords, Power adapter, Power cables, connectors, mounting kit and other required accessories for successful commissioning of the Wi-Fi network shall be provided by the Bidder and shall be properly cased and tied such that it doesn't get broken

g. All intended coverage areas must be covered with wireless AP/array for high rate data applications. For density concerns, there must be multiple radios per classroom/area. Each wireless AP/array must be 802.11 a/b/g/n/ac 3x3:3 MIMO WAVE2 capable and be able to scale without adding additional controllers or user licenses. At each site Bidder must consider at least one primary controller and secondary controller to avoid a single point of failure.

h. The controller should be configured with 1 + 1 in Active-Active Load Balancing mode.

i. Hardware / Software based controller should be ready for supporting 100 AP's and 10000 devices from day one to run in Active-Standby / Active-Active Load Balancing Mode, with scalability for 500 AP support in future.

j. Each wireless device (not system) must support per SSID traffic shaping and limiting at line-rate at the Access Point (not controller). This is to prevent additional data on the network

k. Each wireless device (AP) must employ a future-proof modular architecture for upgradability to future standards

l. Bidder must include PoE-injectors in the pricing and clearly define where PoE injectors are needed

m. System must include a centralized management system that provides a platform for central management of all devices across the network

n. Where ever applicable, Bidder shall have to integrate the existing wired LAN and internet links to the Wi-Fi solution

o. PVC case wiring should be done for the entire required passive cabling i.e. UTP and electrical wiring

p. Bidder will ensure a secure Wi-Fi connectivity and internet access through user Login ID and password to all the subscribers with central authentication mechanism

q. Bidder shall ensure that unique user ID and Password do not have provisions for simultaneous multiple logins

r. Policy on validity of the user ID and Password for internet access should be configurable as per the requirement.

s. Wi-Fi access points (APs) must be configured to use cryptographic keys or other methods to ensure that only authenticated users can use the Wi-Fi services

t. Internal / External AAA server should be deployed ensuring DOT guidelines for providing public Wifi access. The log trails for any specific user shall be made available online for at least last 3 months and the backup shall be kept for one year.

u. The system should be capable of managing automatically upgrade or degrade of end-user's account after threshold usage (download/time limit) is reached

v. The Wi-Fi network should be secure and conform to the industry standard security requirement. Bidder shall suggest and help ASCL team to deploy policies at various levels (i.e. on firewall, IDS, antivirus etc.) to prevent any attack/intrusion in the Wi-Fi network

w. The Bidder shall be responsible for integrating the Wi-Fi Network with the existing LAN/SWAN network

x. The Bidder shall be responsible for integrating the available payment gateway(s) at ASCL for making online payments (if any) according to respective plans for internet usage

y. The Bidder shall be responsible for integrating the available SMS gateway (HTTP) at ASCL for automatically sending the required details/ information through SMS to the users as per the requirement e.g. during user registration, forgot password, password reset etc

z. Weigbridge Monitoring: Electronic weighbridges shall be installed to measure the input being carried into by the incoming vehicles as well as to check the produced output after the compost generation. The same shall be fed into the weighbridge software for processing data date wise, truck wise, shift wise, etc. The same shall be passed on to ICCC for day-to-day monitoring of waste treatment, disposal and compost generation and for generation of daily, weekly & monthly reports. The MSI will also have to make a provision for inclusion of any additional weighbridges identified, in the future, to be monitored at the ICCC. The rates for weighbridge discovered as part of the ICCC RFP can be used for procurement of the additional weighbridges.

The functional requirements and technical specifications provided in this RFP are indicative and carry guiding rule. The MSI is free to offer products and solutions which meet requirements of the RFP focusing on the outcome, future scalability, security, reliability and adherence to specified SLA under this RFP, in line with applicable standards & best practices adopted in the industry. The MSI is encouraged to design an Optimised solution which is technically superior, innovative, proven, better in terms of functionality and is cost effective. Any specified parameters mentioned in the scope/technical requirement in the RFP may be considered if it is required for meeting current & future requirements during the contract period. The MSI is fully responsible for the specified outcome to be achieved.

For more details on technical and functional specifications of City Wide Wi-Fi solution, the MSI should refer to Annexure I for functional requirements and technical specifications.

5.6.1.10. Design & Implementation of Digital Information Kiosk

The scope of work for the MSI will include installation of Digital Information kiosk at identified location across the city.

The MSI will be responsible for design and implementation and maintenance of Digital Information Kiosk as per below requirements and should not be limited to:

a. The MSI will have to conduct a survey and finalize the location with AMC/ASCL

b. The MSI will be responsible for replacement, repair and periodic updation of Kiosk

c. During warranty period besides service/maintenance of Hardware, System Software and its Peripherals, all software up-gradation, bugs/patches and services shall be provided free of cost by the vendor

d. The MSI must not bid/supply any equipment that is likely to be declared end of sale within the 5 years from the Bid Date. The bidder would be required to replace all such equipments/faulty spares/peripherals with latest and at least of equivalent configuration if not better in such case.

e. Below mentioned are the high level requirement to be part of Digital Information Kiosk (not limited to):

I. About Agartala

- Agartala city map
- History of Agartala
- Location of historical Places
- Event updates

II. Law & Order

- Helpline numbers
- SOS function

III. **Tourism Details**

IV. **Information about public transports**

V. **Provision for advertisements**

The functional requirements and technical specifications provided in this RFP are indicative and carry guiding rule. The MSI is free to offer products and solutions which meet requirements of the RFP focusing on the outcome, future scalability, security, reliability and adherence to specified SLA under this RFP, in line with applicable standards & best practices adopted in the industry. The MSI is encouraged to design an Optimised solution which is technically superior, innovative, proven, better in terms of functionality and is cost effective. Any specified parameters mentioned in the scope/technical requirement in the RFP may be considered if it is required for meeting current & future requirements during the contract period. The MSI is fully responsible for the specified outcome to be achieved.

For more details on technical and functional specifications of Digital Information Kiosk, the MSI should refer to Annexure I for functional requirements and technical specifications.

5.6.1.11. Design & Implementation of City Network Backbone (OFC Network)

Fiber backbone infrastructure is an important component of the entire smart city initiative that shall enable the delivery of all the key and important services to be made available to its citizens with seamless access. Network backbone infrastructure shall comprise of dark fiber, setting of various point of presence (PoP) that shall be established across city. The fiber shall be further utilized for services to be enabled as and when required.

The scope of work for the MSI while implementing City Network Backbone are:

1. **Route Survey and Network Design Preparation:**
    a. The MSI shall prepare the route map & network design and submit the final route maps and network design to the Authority for their approval.
    b. The MSI are advised to make a detailed survey and familiarize themselves with the soil and terrain so that the rates quoted takes all factors into consideration
    c. Based on the survey and studies, MSI has to adopt all three approach for laying the OFC in the city.
        i. On Non Duct Routes: Ducting, Trenching and Laying of Optical Fibre in the HDPE ducts
        ii. On Ducted Routes: Utilitzing the utilities ducts and laying the fibre in these ducts
        iii. Arial: Laying of overhead OFC
    d. MSI will have to approve route survey, laying method and network design with the ASCL
    e. MSI through preliminary survey to decide on number of drop and insert junctions, Length of the cable required, etc.

f. Detailed information security architecture to ensure data privacy as well as security

2. Fibre Implementation

a. All fittings, accessories and associated works for proper and safe installation of fiber assets to be taken into consideration by the SI

b. Laying, jointing, live line installation, testing and commissioning of all optical fiber and its accessories

c. Training of Engineers / linesmen, both in supplier's premises and at site, in the installation, operation and maintenance of the optical fiber cables.

3. Core Backbone

a. The core backbone shall be established using 48 Core or more Optical Fiber Cables. Finalization of cores to be done after detailed study on the Bandwitch requirement from the smart elements.

b. The core architecture shall be established maintaining high level of redundancy and no single point of failure.

c. Adequate number of cores in each laid OFC shall be redundant for future scalability and maintenance activity.

d. The maximum fiber distance between Core and Zone layer shall not exceed 8 Kms

e. Adequate loop of 10 to 15 meters of OFC shall be kept loose on junctions wherever applicable.

f. There shall not be more than one Splice, Joint closures installed between two (2) locations, during hand over of Network to Authority.

g. All the cores shall be spliced & joined in the Core Backbone.

h. The colour code shall be uniformly followed across the Core ring, zonal aggregation ring & ward ring.

i. The core shall adhere to industry standards.

4. Ownership

The entireownership of the project's fibre optic network at any given point shall remain with ASCL.

5. The functional requirements and technical specifications provided in this section are indicative and carry guiding rule. The MSI is free to offer products and solutions which meet requirements of the RFP focusing on the outcome, future scalability, security, reliability and adherence to specified SLA under this RFP, in line with applicable standards & best practices adopted in the industry. The MSI is encouraged to design an Optimised solution which is technically superior, innovative, proven, better in terms of functionality and is cost effective. Any specified parameters mentioned in the scope/technical requirement in the RFP may be

considered if it is required for meeting current & future requirements during the contract period. The MSI is fully responsible for the specified outcome to be achieved.

6. For more details on technical and functional specifications of Laying of OFC, the MSI should refer to Annexure I for functional requirements and technical specifications.

5.6.1.12. Geographical Information System (GIS) platform

The scope of work for the MSI will include utilization of GIS system at ASCL/AMC & integrate it with ICCC or other systems. The MSI will have to consult with ASCL/AMC and confirm what all GIS map/layer/datatset is available with the city. If the map/layer/dataset is not already available or in the process of being created by the city, the MSI will have to prepare the GIS base maps, layers and dataset for all the components, assets, properties, critical infrastructure etc. as the part of this project. It will also be the scope of MSI to develop component specific GIS layers/utilities as & when requested by ASCL/AMC. The MSI will also be responsible to ensure that the GIS datasets are updated at regular frequency based on nature of datasets to ensure accuracy during the course of the entire project.

The MSI is required to carry out implementation of City GIS Platform and seamless integration to ensure ease of use of GIS in the Dashboards at ICCC. If this requires field survey, it needs to be done by MSI. If such a data is already available with city, it shall facilitate to provide the same. The MSI is required to update GIS maps from time to time.

The MSI will be required to undertake a detailed assessment for integration of all the Field level ICT interventions proposed with the Geographical Information System (GIS).

The scope of work for the MSI while implementing GIS are:

1. Creation of City Base Map
2. Creation of layers for roads, properties, forest zones etc.
3. Mapping of city assests, utilities, smart components in the Map/ Layers
4. Mapping of potentially affected infrastructure in high-hazard zone in one municipality that will include critical infrastructure (life-line infrastructure, schools, police stations etc), housing, commercial and industrial facilities, transport infrastructure etc.

An indicative list of the GIS datasets that are relevant to ICCC operations and would be required to be collected from stakeholder/end users departments, field surveys and other ongoing projects is given below in the table:

S. No.	Systems/Departments	GIS Dataset
1.	Solid Waste Management	Garbage secondary collection points and Landfill in city
2.		Location of Community Bins

S. No.	Systems/Departments	GIS Dataset
3.		Type of fleet vehicle
4.		Location of toilets
5.	Public Transport	Bus Routes on GIS Map
6.		Location of Bus Stations, Bus Depots, Bus Stops
7.	Traffic and Police	Location of traffic lights
8.		Locations of existing surveillance cameras from Traffic and Police
9.		Location of police stations
10.	Electricity / Power	Location of Energy Assets (Sub-stations, Transmission network etc)
11.		Location of the Energy Network on GIS map
12.	Housing & Slums	Location of Slums
13.	Smart Poles	Location of Smart Poles
14.		Features on each Smart Pole
15.	Smart Parking	Location and number of Parking Slots
16.	Street Lights	Location of Street Lights
17.	Property Taxes (AMC-Revenue)	Properties on GIS map
18.	E-Governance	Population by each ward

S. No.	Systems/Departments	GIS Dataset
19.		Location of important Government buildings
20.		Location of Tourist Attractions
21.		Location of Public Advertisement Boards
22.	Disaster Management	Location of highest Disaster Impact Areas in the city (Geofence)
23.	Emergency Management	Location of Fire Hydrants
24.		Location of fire stations
25.		Amenities at the each Fire Station
26.		Location of Health centres/Hospital
27.		Amenities at each Health Centre/Hospital
28.		Type of fleet vehicle
29.	Water	Location of Water Assets
30.		Location of Water Network on GIS map
31.	Sewerage	Location of Sewerage Assets (STPs, ETPs etc)
32.	Storm Water	Location of Storm Water drains

The functional requirements and technical specifications provided in this section are indicative and carry guiding rule. The MSI is free to offer products and solutions which meet requirements of the RFP focusing on the outcome, future scalability, security, reliability and adherence to specified SLA under this RFP, in line with applicable standards & best practices adopted in the industry. The MSI is encouraged to design an Optimised solution which is technically superior, innovative, proven, better

in terms of functionality and is cost effective. Any specified parameters mentioned in the scope/technical requirement in the RFP may be considered if it is required for meeting current & future requirements during the contract period. The MSI is fully responsible for the specified outcome to be achieved.

For more details on technical and functional specifications of GIS Platform, the MSI should refer to Annexure I for functional requirements and technical specifications.

5.6.1.13. Design & Implementation of Artificial Intelligence System with Edge Analytics

The MSI will be responsible for designing and implementing Artificial Intelligence System through various CCTV cameras, sensors etc. at the edge/field devices with continuous learning capabilities. Following listed use cases should be part of implementation and should be not be limited to:

1. Graffiti and Vandalism detection
2. Debris and Garbage detection
3. Attendance of sanitation workers on site by face recognition
4. Sweeping and cleaning of streets/bins before and after
5. Garbage bin, cleaned or not
6. Litter detection
7. Tracking of garbage truck movement and Quantity of garbage dumped at dumpsite
8. Detection and Recognize the pattern of demonstration and conflicts in crowd
9. Detection and classification of human, animal and vehicle
10. Safety: Detection and classification based on:
    a. Behavioural Biometry : Identification through multiple behaviour
    b. Parking violation
    c. Speeding vehicle
    d. Accident detection
    e. Loitering detection
    f. Person climbing barricade
    g. Person collapsing
    h. Person/Face recognition
    i. Gesture recognition : Identification through gesture change
11. 'Vehicle of interest' tracking by colour, speed, number plate
12. Detection of number of two wheeler with people without
13. Unwanted/ banned vehicle detection

14. Wrong way or illegal turn detection
15. Water quality sensors at District Metered Area level
16. Environmental condition detection
17. Air quality detection

The functional requirements and technical specifications provided in this RFP are indicative and carry guiding rule. The MSI is free to offer products and solutions which meet requirements of the RFP focusing on the outcome, future scalability, security, reliability and adherence to specified SLA under this RFP, in line with applicable standards & best practices adopted in the industry. The MSI is encouraged to design an Optimised solution which is technically superior, innovative, proven, better in terms of functionality and is cost effective. Any specified parameters mentioned in the scope/technical requirement in the RFP may be considered if it is required for meeting current & future requirements during the contract period. The MSI is fully responsible for the specified outcome to be achieved.

For more details on technical and functional specifications of Artificial Intelligence solution, the MSI should refer to Annexure I for functional requirements and technical specifications.

5.6.2. Design, Supply, Installation and Commissioning of Network & Backbone Connectivity for ICCC and other Smart Components

1. Network & Backbone Connectivity is an important components of the project and needs very careful attention in assessment, planning and implementation. It is important not only to ensure that the required connectivity is provisioned within the required timelines but also ensure that it is reliable, secure and supports the required SLA parameters of Latency, Jitter, Packet Loss and Performance.
2. In order to meet the project requirements and SLA requirements as defined in this RFP, it has been decided that the MSI shall provision bandwidth/connectivity requirements as below:
    a. For all locations, where field infrastructure would be operational the MSI should consider the bandwidth/network connectivity requirements from field locations to Data Center/ICCC as defined in Annexure IX for 5 years from date of Go-Live
3. The provisioning of the PoPs for the City Network Backbone at the Junction and other field locations will be mutually agreed upon by the ASCL and the MSI for the ICCC project.
4. The MSI should provide a detailed network architecture of the overall system, incorporating findings of site survey exercise. The network so envisaged should be able to provide real time data streams to the Data Centre, and ICCC. All the components of the technical network architecture should be of industry best standard and assist MSI in ensuring that all the connectivity SLAs are adhered to during the operational phase.
5. The MSI shall prepare the overall network connectivity plan for this project. The plan shall comprise of deployment of network equipment at the junctions/locations to be connected over network, any clearances required from other government departments for setting up of

the entire network. The network architecture proposed should be scalable and in adherence to network security standards. It is necessary that at least 70% of the proposed last mile connectivity should be wired. Last Mile to be defined as "the access link from the service provider's PoP – (as per Telco Standards) to the field device".

6. MSIs are also required to do the estimation of bandwidth requirements considering following benchmark parameters:

#	ICCC System Components	Consideration
1	Integrated Traffic Management System	• As per designed solution requirements for real time data transmission
2	Variable Message Display (VMD) Boards	• As per designed solution requirements for real time data trasmission
3	Surveillance Cameras	• Resolution: 1920x1080 • Frame Rate: 25 fps
4	ANPR Cameras	• Resolution: 1920x1080 • Frame Rate: 25 fps
5	City Wide Wi-Fi	• As per designed solution requirements for real time data transmission
6	RLVD	• Video footage of incident (t-5 seconds to t+5 seconds, where t is time of incident) at required high resolution • Minimum 4 Images of violating vehicle along with Number plate
7	Intelligent Poles	• As per designed solution requirements for real time data transmission
8	Digital Kiosk, VMS etc.	• As per designed solution requirements for real time data transmission
10	Bus Surveillance, PIS, ETMs, GPS based VTS for Transit Management System	• As per designed solution requirements for real time data transmission

7. The actual bandwidth requirement to cater the above mentioned bandwidth parameters and to meet SLAs would be calculated by the MSI and the same shall be clearly proposed in the technical proposal with detail calculations. ASCL also requires the MSI to meet the parameters of video feed quality, security & performance and thus MSIs should factor the same while designing the solution. ASCL reserves its right to ask the Master Systems

Integrator to increase the bandwidth if the provided bandwidth is not sufficient to give the functionality of the system mentioned in the RFP and adhere to the SLAs.

8. In case the Telecommunication guidelines of Government of India require the purchaser to place Purchase Order to the Service Provider for bandwidth, ASCL shall do so. However, Master Systems Integrator shall sign a contract with Telecom Service Provider(s) and ensure the performance. ASCL shall make payments to the Systems Integrator.
9. The MSI shall be required to submit a detailed installation report post installation of all the equipment at approved locations. The report shall be utilized during the acceptance testing period of the project to verify the actual quantity of the equipment supplied and commissioned under the project.
10. The functional requirements and technical specifications provided in this RFP are indicative and carry guiding rule. The MSI is free to offer products and solutions which meet requirements of the RFP focusing on the outcome, future scalability, security, reliability and adherence to specified SLA under this RFP, in line with applicable standards & best practices adopted in the industry. The MSI is encouraged to design an Optimised solution which is technically superior, innovative, proven, better in terms of functionality and is cost effective. Any specified parameters mentioned in the scope/technical requirement in the RFP may be considered if it is required for meeting current & future requirements during the contract period. The MSI is fully responsible for the specified outcome to be achieved.

5.6.3. Hosting Services

1. The infrastructure of Data Center for ICCC, ITMS, City Surveillance system, Transit Management System, Intelligent Poles, Wi-Fi, etc. shall be hosted in the State Data Centre (SDC) of Govt. of Tripura. ASCL shall be responsible for entering into a Memorandum of Understanding with the nodal agency responsible for managing the SDC in Agartala. The following services shall be provisioned by SDC
    a. Internet Bandwidth
    b. Hosting Space
    c. Power & Cooling
    d. Secured Data Center Environment
2. The ASCL shall borne the charges for hosting data centre services at SDC.
3. The MSI need to do the sizing of rack space required at facilities based on its capacity planning and sizing for the entire duration of the contract with adequate space for future expansion.
4. All the requisite consumables like tapes, hard disks, etc. for backup shall be provided by the MSI as per the project requirements. All the tapes, hard disks, etc. once deployed for the project will become property of ASCL including corrupted/damaged devices.

5.6.4. Design, Supply, Installation and Commissioning of IT Infrastructure at Data Centre (DC) and ICCC

1. It is proposed that the MSI shall provide the IT hardware/software and Non-IT infrastructure at the following locations:

S. No.	Location Type	Location Name	Approximate Area	Indicative IT Infrastructure
1	Integrated Command & Operation Center (ICCC)	Agartala Municipal Corporation (AMC),	2500 SFT	a. Video Wall 55" in 5x2 matrix b. Workstation with VMS Client License: 16 Nos c. IP Phones: 25 Nos d. Simulatneous Viewing Capability: All live Cameras feeds coming at the DC/ICCC
2	Data Center	State Data center	300 SFT	a. DC Infrastructure will be available at State DC b. Servers c. Storage d. Network Switches
3	Cloud DC	Cloud Hosted	NA	Cloud Hosted ICCC & other applicable applications
4	Data Recovery	Cloud Hosted	NA	Cloud Hosted DR (Details provided in next section)

2. MSI has to ensure that redundancy is provided for all the key components to ensure that no single point of failure affects the performance of the overall system. It will be MSI's responsibility to:
    a. Supply, Install and Commission of IT Infrastructure including site preparation in DC, and ICCC
    b. Supply viewing screen, workstations, IP Phones, network switch, and required accessories including furniture at 5 viewing centers. The IT infrastructure of temporary viewing centers will be re-installed to the permanent viewing centers locations to monitor:
        i. Video feeds from field CCTV cameras
        ii. Live MIS Reports of ICCC operations
    c. Establish LAN and WAN connectivity at DC and ICCC

3. State Data Centre should provide a dedicated rack space for the ICCC Infrastructure.
4. Cloud Data Centre developed by MSI should be as per Telecommunications Infrastructure Standard for Data Centers
5. Access to the Cloud Data Centre Space where the ICCC platform is hosted should be restricted and access be given only to the authorized personnel including Networking & Security Infrastructure and other associated ICT Components.
6. The MSI shall provide system integration services to customize and integrate the applications procured through the project. The ICCC system applications proposed by the MSI should have open APIs and should be able to integrate and share the data with other third party systems already available or coming up in the near future
7. As part of preparing the final bill of material for the cloud data center, the successful MSI will be required to list all passive & active components required in the data centers.
8. The bill of material proposed by the successful MSI will be approved by ASCL for its supply and installation. Indicative IT Infrastructure to be commissioned as part of the ICCC project at Data Centre/ICCC are as under:
    a. Servers (inclusive of OS) - Application Servers, Database Server, Video Recording Server, Video Management Server, Enterprise Backup Server, Domain Controller, Failover Servers for application and Recording Servers
    b. Application & System Software (with necessary customization) – Adaptive Traffic Control System application, Video Management System application, ANPR application, Red Light Violation Detection application, Variable Message Display application, E-Challan application, Passenger Information System (PIS) management application, AVLS application, Command & Control Centre Application, etc.
    c. RDBMS (if required)
    d. Anti-virus Software
    e. EMS software
    f. Primary Storage Solution
    g. Storage Management Solution
    h. Core Router
    i. Switches (L2 & L3 Switches)
    j. KVM Switches
    k. Firewall
    l. IP Phones
    m. Racks

n. All required Passive Components

o. Any other Server required to the cater to the scope of work mentioned in this

9. The bidder is expected to calculate and design the IT Infrastructure requirements including compute, storage and video management software licences etc. required for real-time monitoring, recording and integration of IP CCTV (PTZ and Fixed Box) Cameras. The supply, installation and connectivity till ICCC of the provided cameras will be in their scope. MSI is expected to capture and propose the IT Infrastructure for successful oprations and integrations of the same. The following table provides the details of proposed cameras:

S. No.	No. of Locations	Approximate No. of Cameras	Remarks
1	131	464 nos	Permanent infrastructure for City Area

10. The above are only indicative requirements of IT & Non-IT Infrastructure requirements at DC/ICCC. The exact quantity and requirement shall be proposed as part of the technical proposal of the MSI.

11. The MSI shall prepare the overall data centers establishment & their operational plan for this project. The plan shall comprise of deployment of all the equipment required under the project. The implementation roll-out plan for setting up the data centers shall be approved by ASCL. The detailed plan shall be also comprise of the scalability, expandability and security that such data centers will implement under this project.

12. The MSI shall establish a state of the art ICCC, the key components for the same will be as follows:

a. Video Wall system

b. Operator workstations

c. IP Phones

d. Active Networking Components (Switches, Routers)

e. Passive Networking Components

f. Electrical Cabling and Necessary LED Illumination Devices

g. Office Workstations

h. UPS (as per the requirement mentioned in the Technical Specification)

13. The MSI shall be required to submit a detailed installation report post installation of all the equipment at approved locations. The report shall be utilized during the acceptance testing period of the project to verify the actual quantity of the equipment supplied and commissioned under the project.

14. The functional requirements and technical specifications provided in this RFP are indicative and carry guiding rule. The MSI is free to offer products and solutions which meet requirements of the RFP focusing on the outcome, future scalability, security, reliability and adherence to specified SLA under this RFP, in line with applicable standards & best practices adopted in the industry. The MSI is encouraged to design an Optimised solution which is technically superior, innovative, proven, better in terms of functionality and is cost effective. Any specified parameters mentioned in the scope/technical requirement in the RFP may be considered if it is required for meeting current & future requirements during the contract period. The MSI is fully responsible for the specified outcome to be achieved.

5.6.5. Design and Implementation of Disaster Recovery Infrastructure for ICCC project

1. MSI shall propose to host Applications and storage on cloud for complete Data Recovery (DR) operations. Applications should fail-over to the cloud in case of DR. The MSI would have to Design the DR according to RTO (4 hrs.)/RPO (15 min.) criteria and consider active/active and active/passive method.
2. DR shall be implemented based on managed cloud services and shall adhere to guideline issued by MeitY over time to time. SLA for DR shall be as per MeitY guideline.
3. MSI may propose the Cloud Service Provider from the empaneled vendors of Deity.
4. Below are the key factors to be considered for cloud hosting -
    a. The MSI is required to prepare and submit along with their technical proposal, the details of methodologies and computations for sizing and capacity of storage, compute, backup, network and security.
    b. There should be logical separation (of space, servers, storage, network infrastructure and networks) to protect data, applications and servers on Private cloud.
    c. It is expected that bidder will make all necessary provision to ensure high availability at the Data Centre and after switch over to the DR; it gets back in to normal operations from the DC as soon as possible.
    d. One full-scale DR drill to be conducted after go-live and additional DR Drills on half yearly basis shall be conducted.
    e. The system will be hosted in the site identified by the MSI and as agreed by the ASCL for DR (backup only).
    f. There should be sufficient capacity (compute, network and storage capacity offered) available for near real time provisioning (as per the SLA requirement of the ASCL) during any unanticipated spikes in the user load.
    g. DR site will be located in India only.
    h. Ensure redundancy at each level

i. MSI shall provide interoperability support with regards to available APIs, data portability etc. for the ASCL to utilize in case of Change of cloud service provider, migration back to in-house infrastructure, burst to a different cloud service provider for a short duration or availing backup or DR services from a different service provider.

j. The MSI is fully responsible for tech refreshes, patch management and other operations of infrastructure that is in the scope of the MSI.

k. ASCL retains ownership of all virtual machines, templates, clones, and scripts/applications created for the ASCL's application. ASCL retains the right to request (or should be able to retrieve) full copies of these virtual machines at any time

l. Provide a robust, fault tolerant infrastructure with enterprise grade SLAs with an assured uptime of 99.999%, SLA measured at the VM Level & SLA measured at the Storage Levels

m. Cloud services should be accessible via internet and MPLS.

n. Required Support to be provided to the ASCL in migration of the VMs, data, content and any other assets to the new environment created by the ASCL or any Agency (on behalf of the ASCL) on alternate cloud service provider's offerings to enable successful deployment and running of the ASCL's solution on the new infrastructure.

o. The MSI should configure, schedule and manage backups of all the data including but not limited to files, folders, images, system state, databases and enterprise applications

- Perform and store data and file backups consisting of an initial full back up with daily incremental backups for files;
- For the files, perform weekly backups;
- For the databases, perform a twice weekly full database backup, with a three times daily backup of database log files
- Encryption of all backup files and data and management of encryption keys as a service that can be enabled for Government Departments that require such a service.
- Retain database backups for thirty (30) days

p. The MSI should offer dashboard to provide visibility into service via dashboard.

q. MSI shall not delete any data at the end of the agreement (for a maximum of 45 days beyond the expiry of the Agreement) without the express approval of the ASCL.

Preparation of Disaster Recovery Operational Plan

The MSI should provide detailed operating procedures for each application during the following scenarios. These will be mutually agreed upon with ASCL during the project kick off.

a. Business as usual: the primary site is functioning as required, procedures for ensuring consistency of data availability at secondary site.

b. Disaster: Declaration of disaster, making the DR site live for production, ensuring availability of users to the secondary site.

c. Operations from DR site: Ensuring secondary site is addressing the functionality as desired

Configure proposed solution for usage

The service provider shall provide DR Management Solution to ASCL meeting following specifications:

#	Features
1	The proposed solution must offer a workflow based management & monitoring and reporting capability for the real time monitoring of a DR solution parameters like RPO (at DB level), RTO, replication status and should provide alerts(including SMS and e-mail alerts) on any deviations. The proposed solution should be able to conduct DR Drills from a centralized location
2	The proposed solution should provide a single dashboard to track DR Readiness status of all the applications under DR
3	The proposed solution should be capable of reporting important health parameters like disk space, password changes, file addition/deletion etc. to ensure DR readiness
4	The proposed solution should have inbuilt ready to use library of recovery automation action for heterogeneous databases and replication environment. This must significantly reduce custom development of scripts and speedy deployment of DR solutions
5	The proposed solution should facilitate out-of-the-box, workflow based switchover and switchback for DR drills for standard applications based on industry best practices
6	The proposed solution should facilitate workflows for bringing up the applications and all the components it depends on at DR while it is up at primary site without pausing/stopping the replication
7	The proposed solution should be able to manage hosts by either deploying agents or without deploying any agent and should not require any change in the existing environment
8	The proposed solution must support all major platforms including Linux, Windows, Solaris, HP-UX, and AIX with native high availability options. It must support both physical and virtual platforms
9	The proposed solution should facilitate workflow based, single-click recovery mechanism for single or multiple applications
10	The proposed DRM solution should integrate seamlessly with the existing setup without the need to reconfigure or remove existing application setup including clusters

#	Features
11	The proposed solution should cover all the functionalities mentioned in the specifications and all the required licenses should be provisioned

Periodic Disaster Recovery Plan Update

The service provider shall be responsible for –

a. Devising and documenting the DR policy discussed and approved by Authority.

b. Providing data storage mechanism with from the Go-Live date till the date of contract expiry for the purpose of compliance and audit

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5.7. Responsibility Matrix

#	Key Activities	MSI	AMC	ASCL	Network Vendors	Electricity Providers	Other Utilities	Other Departments	PMC	Exisitng ICT Vendors at ASCL
Project Inception Phase										
1	Project Kick Off	R/A	C	C	I	I	I	I	C	I
2	Deployment of manpower	R/A	C	C	I	I	I	I	C	I
Requirement Phase										
3	Assess the requirement of IT Infrastructure and Non IT Infrastructure	R/A	C	C	C	C	C	C	C	C
4	Assessment of Business processes	R/A	C	C	I	I	I	C	C	I
5	Assessment of requirement of Software requirements	R/A	C	C	I	I	I	C	C	I

#	Key Activities	MSI	AMC	ASCL	Network Vendors	Electricity Providers	Other Utilities	Other Departments	PMC	Exisitng ICT Vendors at ASCL
6	Assess the Integration requirement	R/A	C	C	C	C	I	C	C	C
7	Assess the connectivity requirement all locations (including Building)	R/A	C	C	C	I	I	C	C	I
8	Assessment the Network laying requirement	C	C	C	R/A	I	I	C	C	I
9	Assessment of training requirement	R/A	C	C	I	I	I	C	C	I
Design Phase										
10	Develop the Concept of Operations (CONOPS)	R/A	C	C	C	I	I	C	C	I
11	Formulation of Solution Architecture	R/A	C	C	C	I	I	C	C	I
12	Creation of Detail Drawing	R/A	C	C	C	I	I	C	C	I
13	Detailed Design of Smart City Solutions	R/A	C	C	C	I	I	C	C	I
14	Development of test cases (Unit, System Integration and User Acceptance)	R/A	C	C	C	I	I	C	C	I
15	Preparation of final bill of quantity and material	R/A	C	C	C	C	I	C	C	I
16	SoP & KPIs preparation	R/A	C	C	C	C	C	C	C	I
Development Phase										
17	Helpdesk setup	R/A	C	C	I	I	I	I	C	I
18	Physical Infrastructure setup	R/A	C	C	I	I	I	I	C	I
19	Procurement of Equipment , edge devices, COTS software (if any), Licenses	R/A	C	C	I	I	I	I	C	I

#	Key Activities	MSI	AMC	ASCL	Network Vendors	Electricity Providers	Other Utilities	Other Departments	PMC	Exisitng ICT Vendors at ASCL
20	IT and Non IT Infrastructure Installation	R/A	C	C	I	I	I	I	C	I
21	Development, Testing and Production environment setup	R/A	C	C	I	I	I	I	C	I
22	Software Application customization (if any)	R/A	C	C	I	I	I	I	C	I
23	Development of Bespoke Solution (if any)	R/A	C	C	I	I	I	I	C	I
24	Integration with Third party services/ application (if any)	R/A	C	C	I	I	I	I	C	I
25	Unit Testing	R/A	C	C	I	I	I	I	C	I
26	Implementation of Solutions	R/A	C	C	I	I	I	I	C	I
27	Preparation of User Manuals , training curriculum and training materials	R/A	C	C	I	I	I	I	C	I
28	Role based training(s) on the Smart City Solutions	R/A	C	C	I	I	I	I	C	I
Integration Phase										
29	SoP & KPI implementation	R/A	C	C	C	C	C	C	C	I
30	Integration with GIS	R/A	C	C	C	C	C	C	C	I
31	Integration of solutions with Command and Control Centre	R/A	C	C	C	C	C	C	C	I
32	Integration Testing	R/A	I	I	C	C	C	C	C	C
33	User Acceptance Testing	A	R	R	C	C	C	C	C	I
Go –Live										

#	Key Activities	MSI	AMC	ASCL	Network Vendors	Electricity Providers	Other Utilities	Other Departments	PMC	Exisitng ICT Vendors at ASCL
34	Go Live	R/A	C	C	I	I	I	I	C	I
Operation and Maintenance										
35	Operation and Maintenance of IT, Non IT infrastructure and Applications	R/A	C	C	I	I	I	I	C	I
36	SLA and Performance Monitoring	R/A	C	C	I	I	I	I	C	I
37	Logging, tracking and resolution of issues.	R/A	C	C	I	I	I	I	C	I
38	Application enhancement	R/A	C	C	I	I	I	I	C	I
39	Patch & Version Updates	R/A	C	C	I	I	I	I	C	I
40	Helpdesk services	R/A	C	C	I	I	I	I	C	I

Note: All decisions will be taken by ASCL which will be abided by all the stakeholders in the above matrix.

R/A = Responsible/Accountable

C = Consulted

I = Informed

5.8. Project Deliverables

#	Key Activities	Deliverables
1	Project Kick Off	1. Project Plan 2. Risk Management and Mitigation Plan
2	Deployment of manpower	
3	Assess the requirement of IT Infrastructure and Non IT Infrastructure	1. Functional Requirement Specification document 2. System Requirement Specification document 3. Requirements Traceability Matrix 4. Site Survey Report
4	Assessment of Business processes	
5	Assessment of requirement of Software requirements	
6	Assess the Integration requirement	

#	Key Activities	Deliverables
7	Assess the connectivity requirement of all locations (including Building)	
8	Assessment of network laying requirement	
9	Assessment of training requirement	
10	Formulation of Solution Architecture	1. Final Bill of Quantity 2. HLD documents 3. LLD documents 4. Application architecture documents 5. Technical Architecture documents. 6. Network Architecture documents. 7. ER diagrams and other data modeling documents. 8. Logical and physical database design. 9. Logical and physical infra architecture 10. Data dictionary and data definitions. 11. GUI design (screen design, navigation, etc.). 12. Test Plans 13. SoPs & KPIs 14. Change management Plan
11	Creation of Detail Drawing	
12	Detailed Design of Smart City Solutions	
13	Development of test cases (Unit, System Integration and User Acceptance)	
14	Preparation of final bill of quantity and material	
15	SoPs & KPIs preparation	
16	Helpdesk setup	1. IT and Non IT Infrastructure Installation Report 2. Training Completion report 3. Application deployment and configuration report 4. Unit Testing Report 5. Functional Testing Report
17	Physical Infrastructure setup	
18	Procurement of Equipment , edge devices, COTS software (if any), Licenses	
19	IT and Non IT Infrastructure Installation	
20	Development, Testing and Production environment setup	
21	Software Application customization (if any)	
22	Development of Bespoke Solution (if any)	
23	Integration with Third party services/application (if any)	
24	Unit Testing	
25	Implementation of Solutions	

#	Key Activities	Deliverables
26	Preparation of User Manuals , training curriculum and training materials	
27	Role based training(s) on the Smart City Solutions	
28	SoP & KPIs implementation	1. Integration Testing Report 2. Completion of UAT and closure of observations report
29	Integration with Smart Components	
30	Integration of solutions with Command and Control Centre	
31	Integration Testing	
32	User Acceptance Testing	
33	Go Live	1. Go-Live Report
34	Operation and Maintenance of IT, Non IT infrastructure and Applications	1. Detailed plan for monitoring of SLAs and performance of the overall system 2. Fortnightly Progress Report 3. Monthly SLA Monitoring Report and Exception Report 4. Quarterly security Report 5. Issues logging and resolution report
35	SLA and Performance Monitoring	
36	Logging, tracking and resolution of issues.	
37	Application enhancement	
38	Patch & Version Updates	
39	Helpdesk services	

5.9. Project Timelines

Services	Approximate Time for Issuance of Request Order	Tentative Scope/ Approximate Sizing	Tentative Lead Time
Request Order	One week post issue of LOI/ completion of site survey activity	1. ICCC - IT hardware 2. ICCC - Non-IT equipment 3. ICCC – software 4. Data Center Cloud – Hardware 5. Data Center Cloud- Software 6. Data Center (DC) – Hardware 7. Data Center (DC) – Software 8. Data Center (DC) – Non-IT equipment 9. DR – Hardware 10. DR – Software 11. DC-DR link	6 months post issuance of Request Order

Services	Approximate Time for Issuance of Request Order	Tentative Scope/ Approximate Sizing	Tentative Lead Time
		12. Implementation and Integration of City Surveillance System – 23 Traffic Junctions/131 Locations 13. Implementation and Integration of Integrated Traffic Management System/ Traffic Violation Detection – 23 Traffic Junctions/Locations 14. Implementation and Integration of 23 Variable Message Display (VMD) Boards at different identified Locations 15. Implementation and Integration of Transit Management System for 173 City Buses & 8000 Autorickshaw 16. Implementation& Integration of AVLS in AMC Vehicles 17. Implementation and integraton of PIS at 48 bus stops 18. Implementation of city wide Wi-Fi with 23 access points 19. Implementation and Integration of 26 Digital Information Kiosk 20. Implementation and Integration of Intelligent Poles – 6 21. Approx. 102 km OFC 22. Integration with GIS (Sub-System) 23. Integration of all smart components with ICCC 24. DR Services	

6. Annexure I- Functional Requirements & Technical Specifications

The functional requirements and technical specifications provided in the below sections and at other sections in this RFP are indicative and carry guiding rule. The MSI is free to offer products and solutions which meet requirements of the RFP focusing on the outcome, future scalability, security, reliability and adherence to specified SLA under this RFP, in line with applicable standards & best practices adopted in the industry. The MSI is encouraged to design an Optimised solution which is technically superior, innovative, proven, better in terms of functionality and is cost effective. Any specified parameters mentioned in the scope/technical requirement in the RFP may be considered if it is required for meeting current & future requirements during the contract period. The MSI is fully responsible for the specified outcome to be achieved.

6.1. Integrated Traffic Management System (ITMS)

Traffic management comprises of the continuous process of monitoring the road network, assessing the state of the network based on the monitored information, determining what action should be taken and then implementing the traffic management intervention on the road network thereby monitoring the road network for determining the effect of the intervention. In addition to these core operational functions, road network managers need to concern themselves with safety, environment and driver compliance with rules and regulations. The ultimate goal is to "Improve Traffic Quality".

The functional requirements and technical specifications provided in the below sections are indicative and carry guiding rule. The MSI is free to offer products and solutions which meet requirements of the RFP focusing on the outcome, future scalability, security, reliability and adherence to specified SLA under this RFP, in line with applicable standards & best practices adopted in the industry. The MSI is encouraged to design an Optimised solution which is technically superior, innovative, proven, better in terms of functionality and is cost effective. Any specified parameters mentioned in the scope/technical requirement in the RFP may be considered if it is required for meeting current & future requirements during the contract period. The MSI is fully responsible for the specified outcome to be achieved.

6.1.1. Functional Requirement – Integrated Traffic Management System (ITMS)

#	Building Blocks	Bidder Compliance(Yes/No)
1	Traffic Signal Controller	
2	Vehicle Detectors	
3	Communication Network	
4	Software Application	

6.1.1.1. Functional Requirement -Traffic Signal Controller

#	Minimum Specifications	Bidder Compliance(Yes/No)	Product Documentation Reference
1	**Make**	<to be provided by the bidder>	
2	**Model**	<to be provided by the bidder>	
3	The Traffic Signal Controller equipment should be 32 bit or 64 bit microcontroller with solid state traffic signal lamp switching module with the ability to program any combination of traffic signal stages, phases and junction groups. The controller shall preferably have a conflict monitoring facility to ensure that conflicting, dangerous are pre-flagged at the programming stage and these are disallowed even during manual override phase.		
4	The Traffic Signal Controller shall be adaptive so that it can be controlled through the central traffic control center as an individual junction or as part of group of traffic junctions along a corridor or a region. The signal controller design shall be flexible for the junction such that it can be easily configured to be part of any corridor or group definition and can be changed through central command controller easily		
5	Site specific configuration data shall be stored in a non-volatile memory device (FLASH memory) easily programmable at the site through keypad or laptop. A minimum of 512KB flash memory and 128KB RAM shall be provided. Volatile memory shall not be used for storing the junction specific plans or signal timings.		
6	All timings generated within a traffic signal controller shall be accurate to plus or minus 100 milliseconds.		
7	The controller shall provide a real time clock (RTC) with battery backup that set and update the time, date and day of the week from the GPS. The RTC shall have preferably minimum of 10 years		

#	Minimum Specifications	Bidder Compliance(Yes/No)	Product Documentation Reference
	battery backup with maximum time tolerance of +/- 2 sec per day.		
8	The controller shall have the facility to update the RTC time from ATCS server, GPS and through manual entry.		
9	The traffic signal system including controller shall have provision for audio output tones and should be disabled friendly.		
10	The controller shall be capable of communicating with the ATCS server through Ethernet on a managed leased line network or any other appropriate stable communication network.		

A) Traffic Police Panel

The controller shall provide the following facilities in a separate panel with provision for lock and key arrangements for use by the Traffic Police.

#	Minimum Specifications	Bidder Compliance(Yes/No)	Product Documentation Reference
1	**Four Hurry Call switches:** The Hurry Call mode shall provide the means to force the controller to a defined stage, without violating safety clearances. A preemption input may be used to demand the Hurry Call mode to give right of way to emergency vehicles. It should be possible to configure the Hurry Call switches to any stage as per site requirements.		
2	**One Forced Flash Switch:** Activation of this switch should force the signal to Flashing Amber / Flashing Red.		
3	**One Auto / Manual Switch:** Activation of this switch should enable manual operation of the controller. Deactivation of the manual switch shall continue from the current stage without interruption.		

#	Minimum Specifications	Bidder Compliance(Yes/No)	Product Documentation Reference
4	**One Manual Advance Pushbutton Switch:** In manual operation mode, the stages appear in the sequence specified in the signal plan timetable. Activating the pushbutton switch shall terminate the currently running stage and start the next, without violating safety clearances.		
5	**One Junction OFF Switch:** Activating this switch should put OFF all signal lamps. On deactivation of the switch the traffic signal controller shall resume its normal operation without violating any safety clearances.		

B) Modes of Operation

The traffic signal controller shall have the following modes of operation:

#	Minimum Specifications	Bidder Compliance(Yes/No)	Product Documentation Reference
1	**Fixed Time (Current Requirement/Scope):** In fixed time (pre-timed) mode the traffic signal controller shall execute stage timings according to the site specific timetable maintained in the traffic signal controller FLASH memory. Inputs from vehicle detectors shall be ignored in this mode and no preemption shall be made on any stage. Cycle time shall remains constant in every cycle execution for a given time period.		
2	**Vehicle Actuation with All Stages Preemption (For future application)**: In the vehicle actuation with all stages preemption mode, the traffic signal controller shall execute stage timings as per demand from vehicle detectors within the constraints of Minimum Green, Maximum Green running period for the stage and Cycle time stored in the traffic signal controller FLASH memory. Preemption shall be possible for all demand actuated stages. Cycle time may vary in every cycle execution.		

#	Minimum Specifications	Bidder Compliance(Yes/No)	Product Documentation Reference
3	**Semi-Actuation (For future application)**: In the semi-actuation mode, the traffic signal controller shall execute stage timings in the vehicle actuated stages as per demand from vehicle detectors within the constraints of Minimum Green, Maximum Green running period for the stage and Cycle time stored in the traffic signal controller FLASH memory. All other stages shall execute the Maximum green time configured for the stage. Preemption shall be possible for all demand actuated stages. Cycle time may vary in every cycle execution.		
4	**Stage Skipping (for future application):** The traffic signal controller shall not execute the stage enabled for skipping when there is no vehicle demand registered for the stage till clearance amber time of the previous stage.		
5	**Vehicle Actuation with Fixed Cycle length (for future application)**: In vehicle actuation with fixed cycle length mode, the traffic signal controller shall execute stage timings as per demand from vehicle detectors within the constraints of Minimum Green, Maximum Green running period for the stage and Cycle time shall be maintained constant during a given timeslot. Preemption for all demand actuated stages except for Priority Stage shall be possible.		
6	**Full ATCS (FATCS) (for future application):** In FATCS mode, the traffic signal controller shall execute stage timings as per demand within the constraints of Minimum Green, Maximum Green running period for the stage and Cycle time specified by the Central Computer during every cycle switching. Preemption for all demand actuated stages except Priority Stage shall be possible in this mode. The traffic signal controller shall identify a communication failure with the central computer within a specified time period. In such an event the signal plan timings shall be		

#	Minimum Specifications	Bidder Compliance(Yes/No)	Product Documentation Reference
	executed from the local timetable stored in the traffic signal controller FLASH memory. Fallback mode of the traffic signal controller shall be vehicle actuated. On restoration of the communication with central computer the traffic signal controller shall automatically resort to FATCS mode. The traffic signal controller shall accept commands for remote selection / de-selection of the following from the Central Computer at ICCC. Hurry Call Flashing Amber / Flashing Red Junction Off If not reverted to the normal operation within the time period listed below, the traffic signal controllers shall timeout the commands and operate normally Hurry Call – 5 Minutes Flashing Amber / Flashing Red – 30 Minutes Junction Off – 30 Minutes The traffic signal controller shall report the following to the Central Computer through the communication network every cycle or on an event as appropriate. Green time actually exercised for each approach (stage preemption timing) against the Green running period set for the approach by the Central Computer Mode of Operation Lamp failure, if any Output short circuit, if any Detector failure, if any		

C) Traffic Signal Controller Operating Parameters

Phases - The controller shall preferably have facility to configure 32 Phases either for vehicular movement, filter green, indicative green, pedestrian movement or a combination thereof.

#	Minimum Specifications	Bidder Compliance(Yes/No)	Product Documentation Reference
1	It shall be possible to operate the filter green (turning right signal) along with a vehicular phase. The filter green signal shall flash for a time period equal to the clearance amber period at timeout when operated with a vehicular phase.		
2	The pedestrian phase signal shall be configured for flashing red or flashing green aspect during pedestrian clearance.		
3	It shall be possible to configure any phase to the given lamp numbers at the site.		
4	**Stages – The controller shall have facility to configure 32 Stages**		
5	**Cycle Plans** – The controller shall have facility to configure 24 Cycle Plans and the Amber Flashing / Red Flashing plan. It shall be possible to define different stage switching sequences in different cycle plans. The controller shall have the capability for a minimum of 32 cycle-switching per day in fixed mode of operation.		
6	**Day Plans** – The controller shall have facility to configure each day of the week with different day plans. It shall also be possible to set any of the day plans to any day of the week. The controller shall have the capability to configure 20 day plans.		
7	**Special Day Plans** – The controller shall have facility to configure a minimum of 20 days as special days in a calendar year.		
8	**Starting Amber** – During power up the controller shall initially execute the Flashing Amber / Flashing Red plan for a time period of 3 Seconds to 10 Seconds. The default value of this Starting Amber is 5 Seconds. Facility shall be available to		

#	Minimum Specifications	Bidder Compliance(Yes/No)	Product Documentation Reference
	configure the time period of Starting Amber within the given limits at the site.		
9	**Inter-green** – Normally the inter-green period formed by the clearance Amber and Red extension period shall be common for all stages. However, the controller shall have a facility to program individual inter-green period from 3 Seconds to 10 Seconds.		
10	**Minimum Green** – The controller shall allow programming the minimum Green period from 5 Seconds to 10 Seconds without violating the safety clearances. It should not be possible to preempt the Minimum Green once the stage start commencing execution.		
11	**All Red** – Immediately after the Starting Amber all the approaches should be given red signal for a few seconds before allowing any right of way, as a safety measure. The controller shall have programmability of 3 Seconds to 10 Seconds for All Red signal.		
12	**Signal lamps monitoring** – The controller shall have inbuilt circuitry to monitor the lamp status		
13	**Green** – Green Conflict Monitoring – The controller shall have a facility to list all conflicting phases at an intersection. The controller should not allow programming of these conflicting phases in a Stage. A hardware failure leading to a conflict condition (due to faulty devices or short circuit in the output) shall force the signal into Flashing Amber / Flashing Red.		
14	**Cable less Synchronization** – It shall be possible to synchronize the traffic signal controllers installed in a corridor in the following modes of operation, without physically linking them and without communication network. GPS enabled RTC shall be the reference for the cable less synchronization.		

#	Minimum Specifications	Bidder Compliance(Yes/No)	Product Documentation Reference
15	Fixed Time mode with fixed offsets		
16	Vehicle Actuated mode with fixed offsets		

D) Input and Output facilities

#	Minimum Specifications	Bidder Compliance(Yes/No)	Product Documentation Reference
1	**Lamp Switching:** The controller shall have maximum 64 individual output for signal lamp switching, configurable from 16 to 32 lamps. The signal lamps shall be operating on appropriate DC/AC voltage of applicable rating		
2	**Detector Interface**: A minimum of 16 vehicle detector inputs shall be available in the controller. All detector inputs shall be optically isolated and provided with LED indication for detection of vehicle.		
3	**Communication Interface**: The traffic signal controller shall support Ethernet interface to communicate with the ITMS server		
4	**Power Saving**: The traffic signal controller shall have a facility to regulate the intensity of signal lamps during different ambient light conditions thereby saving energy.		
5	**Real-time Clock (RTC):** The GPS receiver for updating time, date and day of the week information of the traffic signal controller should be an integral part of the traffic signal controller.		
6	The traffic signal controller shall update the date, time and day of the week automatically from GPS during power ON and at scheduled intervals.		
7	Manual entry for date, time and day of week shall be provisioned for setting the traffic signal controller RTC (Real Time Clock).		

#	Minimum Specifications	Bidder Compliance(Yes/No)	Product Documentation Reference
8	It shall be possible to set the RTC from the Central Server when networked		
9	Keypad (optional): The traffic signal controller shall have a custom made keypad or should have provision for plan upload and download using PC/laptop/Central Server		
10	Operator Display (optional): The traffic signal controller shall optionally have a LED backlit Liquid Crystal Display (LCD) as the operator interface.		

6.1.1.2. Functional Requirement - Camera based Vehicle Detector

The detector equipment shall be a separate logic unit, which may be integrated into the controller, or alternatively mounted in its own housing. The outputs of the detectors shall indicate the presence of vehicles and shall be used to influence the operation of the traffic signal controller and shall generate counts, demands and extensions for right-of-way. Means shall be provided so that a detector may be connected to demand and / or extend a phase movement as specified.

#	Minimum Specifications	Bidder Compliance(Yes/No)	Product Documentation Reference
1	**Make**	<to be provided by the bidder>	
2	**Model**	<to be provided by the bidder>	
3	The MSI shall clearly specify the placement of the detector (upstream, downstream, stop-line, exit etc.) for independent straight and right turn signals.		
4	The detector shall be able to count vehicles in non-lane based mixed traffic flow conditions. The accuracy of counts shall be preferably bigger than 90% over all light and weather conditions. The contractor shall clearly specify how this is accomplished.		
5	The contractor shall give an estimate of the total number of vehicle presence detection zones and		

#	Minimum Specifications	Bidder Compliance(Yes/No)	Product Documentation Reference
	vehicle detectors required and the type of detection system recommended.		
6	A detector that does not change its status at least once during a stage execution shall be notified to the Central Computer (in ITMS mode) at the termination of the associated stage.		

6.1.1.3. Functional Requirement - Countdown Timer

Countdown Timer shall be installed at each traffic junction under ITMS & City Surveillance System.

#	Minimum Specifications	Bidder Compliance(Yes/No)	Product Documentation Reference
1	**Make**	<to be provided by the bidder>	
2	**Model**	<to be provided by the bidder>	
3	Count Down Timer shall be configured in Vehicular Mode.		
4	The Vehicular countdown timer should be dual color, • Red for Stop or STP • Green color for Go		
5	There should be alternate Red and Balance phase time for STOP or STP in Flashing		
6	Alternate Green and Balance Phase Time for Go in Flashing		

6.1.1.4. Functional Requirement - Communication Network

Function of the Communication network shall be for remote monitoring of the intersection and its management. Real time data (like RTC time, stage timing, mode, events, etc.) from the traffic signal controller shall be required to be send to the ITMS application. Central Computer running the ITMS application shall calculate and send optimum signal timings to all intersections in the corridor. The bidder shall clearly specify the bandwidth requirements and the type of network recommended for the ITMS.

The bidder shall specify the networking hardware requirements at the ICCC and remote intersections for establishing the communication network.

6.1.1.5. Functional Requirement -ITMS Software Application

Objective of the ITMS would be to minimize the stops and delays in a road network to decrease the travel time with the help of state-of-the-art technology. The adaptive traffic control system shall operate in real time with the capacity to calculate the optimal cycle times, effective green time ratios, and change intervals for all system traffic signal controllers connected to it. These calculations shall be based up on assessments carried out by the ATCS application software running on a Central Computer based on the data and information gathered by vehicle detectors at strategic locations at the intersections controlled by the system.

The ATCS application software shall do the following:

#	Minimum Specifications	Bidder Compliance (Yes/No)	Product Documentation Reference
1.	**Make**	<to be provided by the bidder>	
2.	**Model**	<to be provided by the bidder>	
3.	Identify the critical junction of a corridor or a region based on maximum traffic demand and saturation.		
4.	The critical junction cycle time shall be used as the group cycle time i.e. cycle time common to all intersection in that corridor or region.		
5.	Stage optimization to the best level of service shall be carried out based on the traffic demand.		
6.	Cycle optimization shall be carried out by increasing or decreasing the common corridor cycle time based on the traffic demand within the constraints of Minimum and Maximum designed value of cycle time.		
7.	Offset correction shall be carried out to minimize number of stops and delays along the corridor for the priority route. Offset deviation measured using distance and speed between successive intersections shall be corrected within 5 cycles at a tolerance of +/- 5 seconds maximum.		
8.	The system shall have provision to configure priority for upstream signals as default. The ATCS software shall continuously check the traffic demand for upstream and downstream		

#	Minimum Specifications	Bidder Compliance (Yes/No)	Product Documentation Reference
	traffic and automatically assign the priority route to the higher demand direction.		
9.	Develop appropriate stage timing plans for each approach of every intersection under the ITMS, based on real time demand		
10.	Propose timing plans to every intersection under the ITMS in every Cycle		
11.	Verify the effectiveness of the proposed timing plans in every cycle		
12.	Identify Priority routes		
13.	Synchronize traffic in the Priority routes		
14.	Manage and maintain communication with traffic signal controllers under ITMS		
15.	Maintain database for time plan execution and system performance		
16.	Maintain error logs and system logs		
17.	Generate Reports on request		
18.	Graphically present signal plan execution and traffic flow at the intersection on desktop		
19.	Graphically present time-space diagram for selected corridors on desktop		
20.	Graphically present network status on desktop		
21.	Make available the network status and report viewing on Web		
22.	The ITMS shall generate standard and custom reports for planning and analysis		
23.	It shall be possible to interface the ITMS with a popular microscopic traffic flow simulation software for pre and post implementation analysis and study of the proposed ITMS control strategy		

#	Minimum Specifications	Bidder Compliance (Yes/No)	Product Documentation Reference
24.	Shall have the ability to predict, forecast and smartly manage the traffic pattern across the signals over the next few minutes, hours or 3-5 days and just in the current real time.		
25.	Shall provide a decision support tool for assessing strategies to minimize congestion, delays and emergency response time to events via simulation and planning tools liked with real time traffic data fusion and control of traffic signaling infrastructure on ground.		
26.	Shall collect continuously information about current observed traffic conditions from a variety of data sources and of different kind (traffic states, signal states, vehicle trajectories, incidents, road works, …)		
27.	Shall infer a coherent and comprehensive observed traffic state (speeds, vehicular densities, and presence of queues) on all network elements, from abovementioned observations, including vehicle trajectories, through a number of map matching, data validation, harmonization and fusion processes		
28.	Shall extend the measurements made on only a number of elements both on the rest of the unmonitored network, and over time, thus obtaining an estimation of the traffic state of the complete network and the evolution of this traffic state in the future		
29.	Shall forecast the traffic state with respect to current incidents and traffic management strategies (e.g. traffic signal control or variable message displays), improving the decision making capabilities of the operators even before problems occur		
30.	Shall calculate customisable Key Performance Indicators (KPI) to quickly assess the results		

#	Minimum Specifications	Bidder Compliance (Yes/No)	Product Documentation Reference
31.	Shall provide calculated traffic flows estimation and forecast, queues and delays to Urban Control and Adaptive Signal Control Systems, allowing for proactive Traffic Management and Control		
32.	Shall generate alerts to the operator that trigger on customizable conditions in the network (starting with simple drops in flow, up to total queue lengths along emission sensitive roads surpassing a definable threshold)		
33.	Shall distribute both collected and calculated traffic information via a variety of communication protocols and channels, ensuring high interoperability degree and thus acting as a "traffic data and information hub"		
34.	Shall create a traffic data warehouse for all historic traffic information gathered from the hardware installed on the road network.		
35.	Shall operate in real time that is continuously updating the estimates on the state of the network and the travel times on the basis of data collected continuously over time.		
36.	Shall operate the traffic lights with the adaptive traffic controls, based on the current and forecasted traffic demand and the current incidents, thus optimizing the green waves continuously throughout the network		
37.	Enable a smart public transport priority respecting the delays for all road users at once with the adaptive signal controller		

A) Reports

System shall generate Corridor based and Intersection based reports. The application software shall generate the following reports, but not limited to the below. All the reports shall be possible for selected dates.

#	Minimum Specifications	Bidder Compliance (Yes/No)	Product Documentation Reference
1.	Intersection based reports		
2.	Stage Timing report – The report shall give details of time at which every stage change has taken place. The report shall show the stage sequence, stage timings and stage saturation of all stages of all cycles for a day. The saturation is defined as the ratio between the available stage timings to the actual stage timing executed by the traffic signal controller for the stage (stage preemption time).		
3.	Cycle Timing report – The report shall give details of time at which every cycle has taken place. The report shall show the cycle sequence and cycle timings for all the cycles in a day.		
4.	Stage switching report – The report shall give details of time at which a stage switching has taken place. The report shall show the stage sequence, stage timings and stage saturation for a day.		
5.	Cycle Time switching report – The report shall give details of time at which a cycle switching has taken place. The report shall show the cycle sequence and cycle timings for the cycle in a day.		
6.	Mode switching report – The report shall give details of the mode switching taken place on a day.		
7.	Event Report - The report shall show events generated by the controller with date and time of event.		
8.	Power on & down: The report shall show time when the master is switched on, and last working time of the master controller.		
9.	Intensity Change – The report shall show the brightness of the signal lamp is changed		

#	Minimum Specifications	Bidder Compliance (Yes/No)	Product Documentation Reference
	according to the light intensity either manually through keypad or automatically by LDR with time stamp.		
10.	Plan Change – The report shall show the time of change of plan either through keypad or remotely through a PC or Server.		
11.	RTC Failure – The report shall show the time when RTC battery level goes below the threshold value.		
12.	Time Update – The report shall show the time when the Master controller updated its time either manually through keypad, automatically by GPS or through remote server.		
13.	Mode Change – The report shall show the time when Master controller's operating mode is changed either manually through keypad or a remote server. The typical modes are FIXED, FULL VA SPLIT, FULL VA CYCLE, FLASH, LAMP OFF and HURRY CALL.		
14.	Lamp Status Report – The report shall show lamp failure report with date and time of failure, colour of the lamp and associated phase		
15.	Loop Failure Report – The report shall show the date and time of detector failure with detector number and associated phase.		
16.	Conflict – The report shall show the conflict between lamps (RED, AMBER, GREEN) in the same phase or conflict between lamps with other phase.		
17.	Corridor Performance Report – The report shall show the saturation of all the intersections in a corridor for every cycle		

#	Minimum Specifications	Bidder Compliance (Yes/No)	Product Documentation Reference
	executed for the corridor and the average corridor saturation for a day		
18.	Corridor Cycle Time Report – The report shall show the Corridor cycle time, Intersection cycle time, Mode of operation and degree of saturation of all the intersections in a corridor for every cycle for a day		

B) Graphical User Interface

The application software shall have the following Graphical User Interface (GUI) for user friendliness.

#	Minimum Specifications	Bidder Compliance (Yes/No)	Product Documentation Reference
1.	User login – Operator authentication shall be verified at this screen with login name and password		
2.	Network Status Display – This online display shall indicate with appropriate colour coding on site map whether an intersection under the ITMS is online or off. On double clicking the intersection a link shall be activated for the traffic flow display for the intersection.		
3.	Traffic Flow Display – This online display shall indicate the current traffic flow with animated arrows, mode of operation, stage number being executed and elapsed stage time.		
4.	Saturation Snapshot – This display shall show the current saturation levels of all intersections in a corridor.		
5.	Reports Printing / Viewing – This link shall allow selection, viewing and printing of different reports available under ITMS		
6.	Time-Space Diagram – The time-space diagram shall display the current stages being		

#	Minimum Specifications	Bidder Compliance (Yes/No)	Product Documentation Reference
	executed at every intersection in a corridor with immediate previous history.		
7.	Junctions shall be plotted proportional to their distance on Y-axis and time elapsed for the stage in seconds on X-axis.		
8.	Junction names shall be identified with each plot.		
9.	Facility shall be available to plot the time-space diagram from history.		
10.	Currently running stage and completed stages shall be identified with different colours.		
11.	Stages identified for synchronization shall be shown in a different colour.		
12.	Speed lines shall be plotter for stages identified for synchronization to the nearest intersection in both directions.		
13.	It should be possible to freeze and resume online plotting of Time-Space diagram.		
14.	The system shall have other graphical interfaces for configuring the ITMS, as appropriate.		

6.1.2. Technical Specifications – Integrated Traffic Management System (ITMS)

6.1.2.1. Integrated Trafic Management - Traffic Sensor

Appropriate camera based traffic sensors may be chosen to provide the operational levels and accuracy as required for successful function of the ITMS system as per the SLAs defined.

6.1.2.2. Integrated Traffic Management - Traffic Controller

Appropriate controller technology may be chosen to provide the operational levels and accuracy as required for successful function of the ITMS system as per the SLAs defined. The proposed traffic controller shall be disabled friendly and shall also provide audio tones output.

6.1.2.3. Integrated Traffic Management System - Traffic Light Aspects

S. No.	Minimum Specifications	Bidder Compliance(Yes/No)	Product Documentation Reference
1.	**Make**	<to be provided by the bidder>	
2.	**Model**	<to be provided by the bidder>	
3.	**Key Features:**		
a.	Shall have less power consumption for all colors, preferably maximum power should not exceed 8 watts for each color		
b.	Shall preferably have temperature compensated power supplies for longer LED life		
c.	Shall have uniform appearance light diffusing		
d.	All units operate at voltage of - 12 / 24 volts DC		
e.	LED shall be single source narrow beam type with clear lens & Luminance uniformity of 1:15		
f.	Pedestrian traffic lights should be provided with clearly audible signals for the benefit of pedestrians with visual impairments		
g.	Phantom Class 5 or equivalent. IP Rating: IP65		
4.	**LED aspects:**		
a.	Red, Amber, Green-Full (300 mm diameter) : Hi Flux		
b.	Green-arrow (300 mm diameter): Hi flux		

S. No.	Minimum Specifications	Bidder Compliance(Yes/No)	Product Documentation Reference
c.	Red, Green – Pdestrian (300 mm diameter): Hi Hlux and Hi Brite		
d.	Animated Pedestrian-Red and Green Animated countdown (300 mm) Hi Brite with diffusions		
5.	**LED Retrofit Specifications:**		
a.	Power supply shall be preferably 230 Vac +/- 10% and frequency 50+/-5Hz		
b.	Standards: EN 12368 compliant		
c.	Convex Tinted Lens shall be available		
d.	Fuse and Transients shall be available		
e.	Operating Temperature Range: As per Agartala weather conditions Turn Off/Turn On Time: 75 milli seconds max		
f.	Total Harmonic Distortion: <20%		
g.	Electromagnetic interference: Meets FCC Title 47,Subpart B, Section 15 Regulation or equivalent EN/IRC standard		
h.	Blowing Rain/Dust Spec: MIL 810F or Equivalent EN/IRC standard complaint		
i.	Minimum Luminous Intensity (measured at intensity point)(cd): Red 400 Amber 400 Green 400		
j.	Dominant Wavelength (nm): Red 630 Amber 590 Green 490		
k.	Lamp conflict compatibility system: Compatible with lamp failure and conflict detection		

6.1.2.4. Countdown Timer

#	Parameters	Minimum Specifications	Bidder Compliance (Yes/No)	Product Documentation Reference
1.	**Make**	<to be provided by the bidder>		

#	Parameters	Minimum Specifications	Bidder Compliance (Yes/No)	Product Documentation Reference
2.	**Model**	<to be provided by the bidder>		
3.	**CPU**	**Micro Controller**		
4.	**Mechanical Specifications**			
A	Structural Material	Polycarbonate strengthened against UV rays		
B	Body Color	Light Grey/Black		
C	Dimensions	Preferably 360mm x 370mm x 220mm (or better)		
5.	**Display Specification**			
A	Lamp Diameter	Minimum 300mm		
B	Digit Height	Minimum 150 -165mm		
C	Display Type	Dual Coloured (Red & Green)		
D	No. of Digit	Minimum 3		
6.	**LED Specifications**			
A	LED Diameter	Minimum 5mm LED		
B	Viewing Angle	Minimum 30°		
C	LED Wave Length	Preferably 630-640nm (Red), 505nm - 520nm (Blue-Green)		
D	LED Dice Material	AIInGap (Red), InGaN (Blue-Green)		
E	LED Warranty period	Minimum 5 years		
7.	**Technical Features**			
A	Power Consumption	Preferably 20 - 30 Watt Per Lamp		
B	Input Power	Preferably 85-260V AC, 50Hz		
C	Operating Temperature	As per Agartala weather conditions		
D	Humidity	As per Agartala weather conditions		
E	Water & Dust Ingress	IP 65		

#	Parameters	Minimum Specifications	Bidder Compliance (Yes/No)	Product Documentation Reference
F	Standard	EN12966 Compliant		

6.1.2.5. Poles for Traffic Signals

Sr. No	Parameters	Minimum Specifications	Bidder Compliance (Yes/No)	Product Documentation Reference
1.	**Make**	<to be provided by the bidder>		
2.	**Model**	<to be provided by the bidder>		
3.	Material	GI Class 'B' pipe		
4.	Paint	Pole painted with two coats of zinc chromate primer and two coats of golden yellow Asian apostolate paint or otherwise as required by architect and in addition bituminous painting for the bottom 1.5 m portion of pole.		

6.1.2.6. Cables for Traffic Signals

Sr. No	Parameters	Minimum Specifications	Bidder Compliance (Yes/No)	Product Documentation Reference
1.	**Make**	<to be provided by the bidder>		
2.	**Model**	<to be provided by the bidder>		
3.	No's of core	As per design requirements		
4.	Materials	As per design requirements		
5.	Certification	ISI Marked		
6.	Standards	Indian Electricity Act and Rules		
A.	IS:1554	PVC insulated electric cables (heavy duty)		

6.2. Surveillance System

Surveillance Cameras are most important component of Traffic & Safety solution for any city. The camera at various location and junctions will have the capability to provide a potential live video to be shared with ICCC for monitoring functions of other departments too (Black spot monitoring, Event Management, etc.). In its endeavor to provide the citizens of Agartala a safe and secure society, Agartala Smart City has made provision to install CCTV/Surveillance cameras across different locations and junctions in the city. All these cameras have to be integrated with the ICCC and also feed will be provided to the Police Control Room. The feed from all of these cameras will be monitored closely to identify incidents (pre-incident and post-incident).

The functional requirements and technical specifications provided in the below sections are indicative and carry guiding rule. The MSI is free to offer products and solutions which meet requirements of the RFP focusing on the outcome, future scalability, security, reliability and adherence to specified SLA under this RFP, in line with applicable standards & best practices adopted in the industry. The MSI is encouraged to design an Optimised solution which is technically superior, innovative, proven, better in terms of functionality and is cost effective. Any specified parameters mentioned in the scope/technical requirement in the RFP may be considered if it is required for meeting current & future requirements during the contract period. The MSI is fully responsible for the specified outcome to be achieved.

6.2.1. Functional Requirement – Surveillance System

Functional Requirement of the overall Surveillance System can be categorised into following components:

1. Information to be Captured by Edge Devices
2. Information to be analysed at ICCC
3. Role Based Access to the Entire System
4. Storage / Recording Requirements
5. Other General Requirements

6.2.1.1. Information to be captured by Edge Devices

Surveillance Cameras being one of the core sub modules of ICCC project, it is important that their selection and placement is carefully done to ensure the full coverage of the traffic junction along with all associated junction arms, accuracy of the information captured on the field and they are rugged, durable & compact. These cameras need to work on 24 X 7 basis and transmit quality video feeds to the ICCC and would capture the video feeds at 25 FPS during entire duration of day for 30 days duration. However, Agartala Police may take the regular review of the requirements for video resolution, FPS and may change these numbers to suit certain specific requirements (for example, there could be a situation when certain cameras are required to be viewed at higher FPS for specific period. It is estimated that not more than 5% of the cameras would be required to be viewed at higher FPS at a given point of time).

6.2.1.2. Information to be analyzed at ICCC

The proposed Video Management System should provide a complete end-to-end solution for security surveillance application. The control centre shall allow an operator to view live / recorded video from any surveillance camera on the IP network. The combination of control centre and the IP network would create a virtual matrix, which would allow switching of video streams around the system.

It has been envisaged that all surveillance cameras would not be simultaneously viewed at Integrated Command & Control Center. The viewing shall vary from time to time and on-demand basis which will help to manage traffic at the junctions and coordinate with the field police officers.

6.2.1.3. Role-Based Access to the Entire System

Various users should have access to the system using single sign-on and should be role based. Different roles which could be defined (to be finalized at the stage of implementation) could be Administrator, Supervisor, Officer, Operator, etc. Apart from role based access, the system should also be able to define access based on location. Other minimum features required in the role based authentication systems are as follows:

a. The management module should be able to capture basic details (including mobile number & email id) of the Police Personnel & other personnel requiring Viewing / Administration rights to the system. There should be interface to change these details, after proper authentication.

b. Rights to different modules / sub-modules / functionalities should be role based and proper log report should be maintained by the system for such access.

c. The system should be with login name & password enabled to ensure that only the concerned personnel are able to login into the system

d. There should be provision to specify hierarchy of operators / officers for control of the cameras from various locations.

e. The number of users shall increase as per phase wise implementation. MSI is expected to estimate and provision the same based on the phase wise requirements.

f. Windows Active Directory/LDAP or any such system can be used to design role based access.

6.2.1.4. Storage/Recording Requirements

It is proposed that the storage solution shall be modular enough to ensure compliance to the changes in storage / recording policy, to be evolved upon initial deployment of the system. The following storage requirements shall be fulfilled by the MSI as scope for the project:

a. The Data Centre (DC) will be hosted at state data center

b. 30 days storage of all the surveillance camera feeds to be stored at Data Centre and Flagged data (critical incidents) will be stored for approximately 90 days, permanent storage envisaged on secondary/backup storage

c. 90 days storage for all traffic enforcement systems including RLVD, speed violation detection, Traffic violation cameras, and ANPR camera at Data Centre.

d. 365 days storage of traffic junction data for ITMS at Data Centre and Flagged data will be stored for approximately 5 years.

e. Above systems except ITMS are required to be stored on Primary storage for 7 days & on Secondary Storage for remaining days respectively at Data Centre.

f. For ITMS, Primary storage will be for 90 days and Secondary Storage for 275 days. Back up storage for 5 Years approximately.

g. Data on storage would be over-written automatically by newer data after the stipulated time period. If some data is flagged by police personnel (or by designated personnel) as important data / evidence data due to some reporting of crime or accident in the area or due to court order or due to suspicious activity, it would need to be stored for longer duration, as per requirements. Agartala Police would analyse such flagged data every 3months to take such decisions for preservation of the flagged data beyond 90 days.

h. Full audit trail of reports to be maintained for 90 days.

i. MSI is expected to carry out the storage requirement estimation and supply as per the solution proposed

j. Archival/Backup to be done on NAS / Scale-out NAS / SAN / Unified or equivalent storage solution

k. Retrieval time for any data stored on secondary storage should be max. 4 hours for critical data & 8 hours for other data.

l. The recording servers / system, once configured, shall run independently of the Video Management system and continue to operate in the event that the Management system is off-line.

m. The system shall support the use of separate networks, VLANs or switches for connecting the cameras to the recording servers to provide physical network separation from the clients and facilitate the use of static IP addresses for the devices.

n. The system shall support H.264 or better, MPEG-4 and MJPEG compression formats for all analog cameras connected to encoders and all IP cameras connected to the system.

o. The system shall record the native frame rate and resolution supplied by the camera or as configured by the operator from the system administration server.

p. The system should not limit amount of storage to be allocated for each connected device.

q. The on-line archiving capability shall be transparent and allow Agartala Police to browse and archive recordings without the need to restore the archive video to a local hard drive for access.

r. The system shall allow for the frame rate, bit rate and resolution of each camera to be configured independently for recording. The system shall allow the user to configure groups

of cameras with the same frame rate, bit rate and resolution for efficient set-up of multiple cameras simultaneously.

s. The system shall support archiving or the automatic transfer of recordings from a camera's default database to another location on a time-programmable basis without the need for user action or initiation of the archiving process. Archiving shall allow the duration of the camera's recordings to exceed the camera's default database capacity. Archives shall be located on either the recording server or on a connected network drive. If the storage area on a network drive becomes unavailable for recording the system should have the ability to trigger actions such as the automatic sending of email alerts and sound alerts to necessary personnel.

t. Bandwidth optimisation

- The Recording Server / System shall offer different codec (H.264, MJPEG, MPEG-4, etc.) and frame rate (CIF, 4CIF, QCIF) options for managing the bandwidth utilisation for live viewing on the Client systems. (through use of multiple systems such as transcoding server)
- From the Agartala Police, the user shall have the option of having video images continually streamed or only updated on motion to conserve bandwidth between the Client systems and the Recording Server.

u. The Recording Server / System shall support camera (analogue and IP cameras) devices from various manufacturers.

v. The Recording Server / System shall support the PTZ protocols of the supported devices listed by the camera OEMs.

w. The system shall support full two-way audio between Client systems and remote devices. (Audio from certain set of cameras can be recorded in future).

x. Failover Support

- The system shall support automatic failover for recording servers. This functionality shall be accomplished by failover server as a standby unit that shall take over in the event that one of a group of designated recording servers fails. Recordings shall be synchronized back to the original recording server once it is back online.
- The system shall support multiple failover servers for a group of recording servers.

y. SNMP Support

- The system shall support Simple Network Management Protocol (SNMP) in order for third-party software systems to monitor and configure the system.
- The system shall act as an SNMP agent which can generate an SNMP trap as a result of rule activation in addition to other existing rule actions.

6.2.1.5. Other General Requirements

1. Management/Integration functionality

a. The Surveillance System shall offer centralised management of all devices, servers and users.

b. The Surveillance System should not have any limit on the number of cameras to be connected for Surveillance, Monitoring and recording. Any increase in the no. of cameras should be possible by augmentation of Hardware components.

c. The Surveillance System should have ability to knit the video streams from multiple cameras, based on the date/time stamp. Every video stream shall have date, time, source camera location, FPS etc. water-marked. These attributes shall be finalised at the System Design time. There shall be a centralised NTP server, from which all devices shall synchronise the date and time.

d. The Surveillance System shall support distributed viewing of any camera in the system using Video walls or big screen displays.

e. The Surveillance System shall support alarm management. The alarm management shall allow for the continuous monitoring of the operational status and event-triggered alarms from system servers, cameras and other external devices.

f. It should be possible to integrate the Surveillance System with 3rd-party software, to enable the users to develop customized applications for enhancing the use of video surveillance solution. For e.g., integrating alarm management to initiate SMS, E-Mail, VoIP call etc.

g. It should be possible to integrate social media platforms to Surveillance System to enable Agartala Police to track and monitor certain trending incident or crime.

h. The Management system shall store the overall network elements configuration in central database, either on the management server computer or on a separate DB Server on the network.

i. System should be able to be integrated with Event Management / Incident Management System, if implemented by Agartala Police in future.

2. System Administration functionality

a. The System Administration Server shall provide a feature-rich administration client for system configuration and day-to-day administration of the system

b. The System Administration Server shall support different logs related to the Management Server

- The System Log
- The Audit Log
- The Alert Log
- The Event Log

3. Rules

The system shall support the use of rules to determine when specific actions occur. Rules shall define what actions shall be carried out under specific conditions. The system shall support rule initiated actions such as:

- Start and stop recording
- Set non-default live frame rate
- Set non-default recording rate
- Start and stop PTZ patrolling
- Send notifications via email
- Pop-up video on designated Client Monitor recipients

4. Client System

a. The Client system shall provide remote users with rich functionality and features as described below.

- Viewing live video from cameras on the surveillance system
- Browsing recordings from storage systems
- Creating and switching between multiple of views.
- Viewing video from selected cameras in greater magnification and/or higher quality in a designated hotspot.
- Controlling PTZ cameras.
- Using digital zoom on live as well as recorded video.
- Using sound notifications for attracting attention to detected motion or events.
- Getting quick overview of sequences with detected motion.
- Getting quick overviews of detected alerts or events.
- Quickly searching selected areas of video recording for motion (also known as Smart Search).

5. Remote Web Client

The web-based remote client shall offer live view of up to 16 cameras, including PTZ control and event / output activation. The Playback function shall give the user concurrent playback of multiple recorded videos with date, alert sequence or time searching.

a. User Authentication – The Remote Client shall support logon using the user name and password credentials

6. Matrix Monitor

a. Matrix Monitor – The Matrix Monitor feature shall allow distributed viewing of multiple camera on the system on any monitor

b. The Matrix Monitor feature shall access the H.264/MJPEG/MPEG4 stream from the connected camera directly and not sourced through the recording server

7. Alarm Management Module

a. The alarm management module shall allow for continuous monitoring of the operational status and event-triggered alarms from various system servers, cameras and other

devices. The alarm management module shall provide a real-time overview of alarm status or technical problems while allowing for immediate visual verification and troubleshooting.

b. The alarm management module shall provide interface and navigational tools through the client including;

   - Graphical overview of the operational status and alarms from servers, network cameras and external devices including motion detectors and access control systems.
   - Intuitive navigation using a map-based, hierarchical structure with hyperlinks to other maps, servers and devices or through a tree-view format.

c. The module shall include flexible access rights and allow each user to be assigned several roles where each shall define access rights to cameras.

d. Basic VMS should be capable to accept third party generated events / triggers

e. Based on alarms/alerts, customised/standard alert messages should be published on VMB/PA, after authorisation by a supervisor/operator.

8. Other Miscellaneous Requirements

a. System should have a facility to create CDs or other storage media for submission to Judiciary, which can be treated evidence for legal matters. Such storage media creation should be tamper proof and MSI to provide appropriate technology so that integrity and quality of evidence is maintained as per requirements of the judiciary. Bidder is required to specify any additional hardware / software required for this purpose & the same can be listed in miscellaneous section of the commercial bid. MSI will also prepare the guideline document to be followed by the Police Personnel for the retrieval of Video / images from the CCTV System so as to maintain integrity of the evidence. Such a guideline document should include methods of retrieval of data, check-list to be followed and flowchart of the entire process to be followed.

b. All the systems proposed and operationalisation of Video Management System should comply with requirements of IT Acts.

c. Any hardware or software required to achieve the functional requirement and technical solution of the overall Project (may not be not specified in the schedule) is to be proposed in the Bid and borne by the MSI.

d. Bidder shall be required to provide a standardized Mobile Application to integrate smart phones and tablets for 2-way communication with the Surveillance System in a secure manner. Agartala Police may provide such tablets / smart phones to the designated Police Personnel. It will be responsibility of MSI to configure such tablets / Smartphone, for the Surveillance System being implemented a part of this project, and ensure that all the necessary access is given to these mobile users. Functionalities to be provided through mobile application: Viewing of any video steam from Central VMS, uploading of video /

pictures central VMS, Location based GIS Map access, tagging of mobile device/location information for all relevant functionalities.

e. There would be the provision for Third party audit periodically, paid by ASCL separately. ASCL reserves the right to appoint any Independent Evaluation Agency at any time during the phases of the project.

6.2.2. Technical Specifications – Surveillance System

6.2.2.1. PTZ Cameras

#	Parameters	Minimum Specifications	Bidder Compliance (Yes/No)	Product Documentation Reference
1.	**Make**	<to be provided by the bidder>		
2.	**Model**	<to be provided by the bidder>		
3.	Video Compression	H.264		
4.	Video Resolution	1920 X 1080		
5.	Frame rate	Min. 25 fps		
6.	Image Sensor	1/3" OR ¼" Progressive Scan CCD / CMOS		
7.	Lens	Auto-focus, 4.3 - 129 mm (corresponding to 30x)		
8.	Minimum Illumination	Colour: 0.5 lux, B/W: 0.1 lux (at 30 IRE)		
9.	Day/Night Mode	Colour, Mono, Auto		
10.	S/N Ratio	≥ 50Db		
11.	PTZ	Pan: 360° endless/continuous, 0.2 to 300°/s (auto), 0.2 to 100°/s (Manual) Tilt: 90°, 0.2 to 100°/s (Auto), 0.2 to 40°/s (Manual) 30x optical zoom and 10x digital zoom 64 preset positions Auto-Tracking Pre-set tour		

#	Parameters	Minimum Specifications	Bidder Compliance (Yes/No)	Product Documentation Reference
12.	Auto adjustment + Remote Control of Image settings	Colour, brightness, sharpness, contrast, white balance, exposure control, backlight compensation, Gain Control, Wide Dynamic Range		
13.	Protocol	HTTP, HTTPS, FTP, RTSP, RTP, TCP, UDP, RTCP, DHCP, UPnP, QoS, IPV4, IPV6, ONVIF Profile S		
14.	Security	Password Protection, IP Address filtering, User Access Log, HTTPS encryption		
15.	Operating conditions	As per City weather conditions		
16.	Casing	NEMA 4X / IP-66 rated, Built in Heater and Blower		
17.	Certification	UL/EN,CE,FCC		
18.	Local storage	Minimum 64 GB Memory card in a Memory card slot. In the event of failure of connectivity to the central server the camera shall record video locally on the SD card automatically. After the connectivity is restored these recordings shall be automatically merged with the server recording such that no manual intervention is required to transfer the SD card based recordings to server.		
19.	IR	Internal/External. IR range should be 100 mtr or better		

6.2.2.2. Fixed Box Cameras

#	Parameters	Minimum Specifications	Bidder Compliance (Yes/No)	Product Documentation Reference
1.	**Make**	<to be provided by the bidder>		
2.	**Model**	<to be provided by the bidder>		
3.	Video Compression	H.264		
4.	Video Resolution	1920 X 1080		
5.	Frame rate	Min. 30 fps		
6.	Image Sensor	1/3" Progressive Scan CCD / CMOS		
7.	Lens Type	Varifocal, C/CS Mount, IR Corrected Full HD		
8.	Lens#	Auto IRIS 5~50mm/ 8 – 40 mm, F1.4		
9.	Minimum Illumination	Colour: 0.5 lux, B/W: 0.1 lux (at 30 IRE)		
10.	IR Cut Filter	Automatically Removable IR-cut filter		
11.	Day/Night Mode	Colour, Mono, Auto		
12.	S/N Ratio	≥ 50 Db		
13.	Auto adjustment + Remote Control of Image settings	Colour, brightness, sharpness, contrast, white balance, exposure control, backlight compensation, Gain Control, Wide Dynamic Range		
14.	Local storage	Minimum 64 GB Memory card in a Memory card slot. In the event of failure of connectivity to the central server the camera shall record video locally on the SD card automatically. After the connectivity is restored these recordings shall be automatically merged with the server recording such that no manual intervention is required to transfer the SD card based recordings to server.		
15.	Protocol	IPV4, IPV6, HTTP, HTTPS, FTP/SMTP, NTP, RTSP, RTP,		

#	Parameters	Minimum Specifications	Bidder Compliance (Yes/No)	Product Documentation Reference
		TCP, UDP, RTCP, DHCP, UPnP, QoS, ONVIF Profile S		
16.	Security	Password Protection, IP Address filtering, User Access Log, HTTPS encryption		
17.	Operating conditions	As per City weather conditions		
18.	Intelligent Video	Motion Detection & Tampering alert		
19.	Alarm I/O	Minimum 1 Input & 1 Output contact for 3rd part interface		
20.	Casing	NEMA 4X / IP-66 rated, IK10, Built in Heater and Blower		
21.	Certification	UL/EN, CE,FCC		

6.2.2.3. Public Address System

The infrared illuminators are to be used in conjunction with the Fix Box / PTZ cameras specified above to enhance the night vision.

#	Parameters	Minimum Specifications	Bidder Compliance (Yes/No)	Product Documentation Reference
1.	**Make**	<to be provided by the bidder>		
2.	**Model**	<to be provided by the bidder>		
3.	PAS system	Should have the capability to control individual PAS i.e. to make an announcement at select location (1:1) and all locations (1: many) simultaneously. The PAS should also support both, Live and Recorded inputs		
4.	Speaker	Minimum 2 speakers, To be used for Public Address System		
5.	Connectivity	IP Based		
6.	Access Control	Access control mechanism would be also required to		

#	Parameters	Minimum Specifications	Bidder Compliance (Yes/No)	Product Documentation Reference
		establish so that the usage is regulated.		
7.	Integration	With VMS and Command and Control Center		
8.	Construction	Cast Iron Foundation and M.S. Pole, Sturdy Body for equipment		
9.	Battery	Internal Battery with different charging options (Solar/Mains)		
10.	Power	Automatic on/off operation		
11.	Casing	IP-55 rated for housing		
12.	Operating conditions	As per City weather conditions		

6.2.2.4. Emergency Call Box

1. A high quality digital transceiver, to be placed at certain traffic junctions determined by the Police Department (mostly at junction boxes / camera poles to avoid any additional investments)
2. Key is to make it easily accessible by public
3. The unit shall preferably have a Double button which when pressed, shall connect to the ICCC/Police Command Center/other locations over the existing network infrastructure setup for ITMS & Surveillance project.
4. These are to be placed only a select locations such as Police/Traffic islands or pedestals or within the vicinity of constant Police supervision or CCTV field of view to avoid misuse and vandalism of the call box.

#	Parameters	Minimum Specifications	Bidder Compliance (Yes/No)	Product Documentation Reference
1.	**Make**	<to be provided by the bidder>		
2.	**Model**	<to be provided by the bidder>		
3.	Construction	Cast Iron/Steel Foundation, Sturdy Body for equipment		
4.	Call Button	Watertight Push Button, Visual Feedback for button press		
5.	Speaker	To be used for Public Address System		
6.	Connectivity	GSM/PSTN/Ethernet as per solution offered		

#	Parameters	Minimum Specifications	Bidder Compliance (Yes/No)	Product Documentation Reference
7.	Sensors	For tempering/Vandalism		
8.	Battery	Internal Battery with different charging options (Solar/Mains)		
9.	Power	Automatic on/off operation		
10.	Casing	IP-55 rated for housing		
11.	Operating conditions	As per City weather conditions		

6.2.2.5. IR Illuminators

The infrared illuminators are to be used in conjunction with the Fix Box / PTZ cameras specified above to enhance the night vision.

#	Parameters	Minimum Specifications	Bidder Compliance (Yes/No)	Product Documentation Reference
1.	**Make**	<to be provided by the bidder>		
2.	**Model**	<to be provided by the bidder>		
3.	Range	Min. 100 meters, with adjustable angle to cover the complete field of view at specified locations		
4.	Minimum Illumination	High sensitivity at Zero Lux		
5.	Power	Automatic on/off operation		
6.	Casing	NEMA 4X / IP-66 rated		
7.	Operating conditions	As per City weather conditions		
8.	Certification	UL/EN/CE/FCC		

6.2.2.6. Field Junction Box

#	Parameters	Minimum Specifications	Bidder Compliance (Yes/No)	Product Documentation Reference
1.	**Make**	<to be provided by the bidder>		
2.	**Model**	<to be provided by the bidder>		

#	Parameters	Minimum Specifications	Bidder Compliance (Yes/No)	Product Documentation Reference
3.	Size	Suitable size as per site requirements to house the field equipment		
4.	Cabinet Material	GI with powder coated		
5.	Material Thickness	Min 1.2mm		
6.	Number of Locks	Preferably Two		
7.	Protection	IP 55, Junction Box design should ensure to keep the temperature within suitable operating range for equipment's and should also avoid intentional water splash and dust intake		
8.	Mounting	On Camera Pole / Ground mounted on concrete base		
9.	Form Factor	Rack Mount/DIN Rail		
10.	Other Features	Rain Canopy, Cable entry with glands, proper earthing and Fans/any other accessories as required for operation of equipment's within junction box.		

6.2.2.7. Poles for Camera

#	Parameters	Minimum Specifications	Bidder Compliance (Yes/No)	Product Documentation Reference
1.	**Make**	<to be provided by the bidder>		
2.	**Model**	<to be provided by the bidder>		

#	Parameters	Minimum Specifications	Bidder Compliance (Yes/No)	Product Documentation Reference
3.	Pole type	Hot Dip Galvanized after Fabrication with Silver coating of 86 micron as per IS:2629; Fabrication in accordance with IS-2713 (1980)		
4.	Height	5-10 Meters (or higher), as-per-requirements for different types of cameras & Site conditions		
5.	Pole Diameter	Min. 10 cm diameter pole (bidder to choose larger diameter for higher height)		
6.	Cantilevers	Based on the location requirement suitable size cantilevers to be considered with the pole		
7.	Bottom base plate	Minimum base plate of size 30x30x1.5 cm		
8.	Mounting facilities	To mount RLVD Cameras, ANPR, CCTV cameras, Traffic Signals, Pedestrian Signals, Switch, etc.		
9.	Pipes, Tubes	All wiring must be hidden, through tubes/pipes. No wires shall be visible from outside.		
10.	Foundation	Casting of Civil Foundation with foundation bolts, to ensure vibration free erection (basic aim is to ensure that video feed quality is not impacted due to winds in different		

#	Parameters	Minimum Specifications	Bidder Compliance (Yes/No)	Product Documentation Reference
		climatic conditions). Expected foundation depth of min. 100cms. Please refer to earthing standards mentioned elsewhere in the document.		
11.	Protection	Lightning arrester shall be provided, to protect all field equipment mounted on pole.		

6.2.2.8. Edge Level Switch at Field Locations

#	Parameters	Minimum Specifications	Bidder Compliance (Yes/No)	Product Documentation Reference
1.	Port Density & Redundancy	The switch should be rugged outdoor DIN rail mountable 8 ports 10/100/1000TX PoE+(min. 4 Port IEEE802.3at Or 8 Port 802.3af) and with 2 100/1000x SFP ports May require higher port density at some locations, depending upon site conditions		
2.	PoE Standard	IEEE 802.3af/ IEEE 802.3at or better on all ports simultaneously		
3.	Quality of Service	Support for Egress rate limiting, Eight egress queues per port, Voice VLAN, DSCP for IP-based QoS, Differentiated services architecture, IEEE 802.1p Class of Service with strict and weighted round Robin scheduling.		
4.	Multicast support	IGMP Snooping V1, V2, V3		

#	Parameters	Minimum Specifications	Bidder Compliance (Yes/No)	Product Documentation Reference
5.	Management	SNMP V1,V2,V3, Web GUI, CLI, USB or equivalent memory card, IP v6 management feature on open standards, IEEE802.1ag, TDM or equivalent standards		
6.	Security	Should support Access Control Lists (ACLs), DHCP snooping, IEEE802.1x based port authentication, RADIUS/ TACACS+, SSL, SSH, port mirroring, NTP		
7.	Resiliency	IEEE802.1q, IEEE802.1d, IEEE802.1s, IEEE802.1w, ring resilience/ring protection		
8.	PoE Power per port	Sufficient to operate the CCTV cameras/edge devices connected		
9.	Enclosure Rating	IP 30 or equivalent Industrial Grade Rating (to be housed in Junction box)		
10.	Operating Temperature	As per Agartala weather conditions		
11.	Safety Certifications	UL/EN/IEC or equivalent, RoHS standards, NEMA –TS2		

6.2.2.9. Online UPS for field locations

Sr No	Parameters	Minimum Specifications	Bidder Compliance (Yes/No)	Product Documentation Reference
1.	**Make**	<to be provided by the bidder>		
2.	**Model**	<to be provided by the bidder>		
3.	Capacity	Adequate capacity to cover all above IT Components at respective field locations		
4.	Technology	IGBT based PWM Technology, True Online UPS		
5.	Input Frequency Range	Preferably 45 to 55 Hz		
6.	Output Frequency Range	Preferably 45 to 55 Hz		

Sr No	Parameters	Minimum Specifications	Bidder Compliance (Yes/No)	Product Documentation Reference
7.	Output Voltage	Preferably 220VAC - 230VAC		
8.	Voltage Regulation	Preferably +/- 2% (or better) and with built-in Over Voltage Cut off facility in the Device		
9.	Frequency	Preferably 50 Hz +/- 0.1% (free Run Mode)		
10.	Harmonic Distortion (THD)	Preferably < 3% (linear load)		
11.	Output Waveform	Pure Sine wave		
12.	Output Power Factor	0.8 or more		
13.	Battery Backup	Adequate and required battery backup to achieve required uptime of field device as well as SLA of the overall solution.		
14.	Battery Type	Preferably Lead acid, Sealed Maintenance Free (SMF)		
15.	General Operating Temperature	As per Agartala weather conditions		
16.	Alarms & Indications	All necessary alarms & indications essential for performance monitoring of UPS like mains fail, low battery & fault detection		
17.	Bypass	Automatic, Manual Bypass Switch		
18.	Certifications	For Safety & EMC as per international standard		

Sr No	Parameters	Minimum Specifications	Bidder Compliance (Yes/No)	Product Documentation Reference
19.	Overall Protection	IP 55, Junction Box design should ensure to keep the temperature within suitable operating range for equipment's and should also avoid intentional watersplash and dust intake		

6.2.2.10. ANPR System

The ANPR System shall enable monitoring of vehicle flow at strategic locations. The system shall support real-time detection of vehicles at the deployed locations, recording each vehicle, reading its number plate, database lookup from central server and triggering of alarms/alerts based on the vehicle status and category as specified by the database. The system usage shall be privilege driven using password authentication.

#	Minimum Specifications	Bidder Compliance (Yes/No)	Product Documentation Reference
1.	**Make**	<to be provided by the bidder>	
2.	**Model**	<to be provided by the bidder>	
3.	**Vehicle Detection by Color** • The system shall detect the color of all vehicles in the camera view during daytime and label them as per the predefined list of configured system colors. The system shall store the color information of each vehicle along with the license plate information for each transaction in the database. • The system shall have options to search historical records for post event analysis by the vehicle color or the vehicle color with license plate and date time combinations		
4.	**Alert Generation**		

#	Minimum Specifications	Bidder Compliance (Yes/No)	Product Documentation Reference
	• The system should have option to input certain license plates according to the hot listed categories like "Wanted", "Suspicious", "Stolen", etc by authorized personnel. • The system should be able to generate automatic alarms to alert the control room personnel for further action, in the event of detection of any vehicle falling in the hot listed categories.		
5.	**Vehicle Status Alarm Module** • On successful recognition of the number plate, system should be able generate automatic alarm to alert the control room for vehicles which have been marked as "Wanted", "Suspicious", "Stolen", "Expired". (System should have provision/expansion option to add more categories for future need). • The Instantaneous and automatic generation of alarms. In case of identity of vehicle in any category which is define by user.		
6.	**Vehicle Log Module** • The system shall enable easy and quick retrieval of snapshots, video and other data for post incident analysis and investigations. • The system should be able to generate suitable MIS reports that will provide meaningful data to concerned authorities and facilitate optimum utilization of resources. These reports shall include.		

#	Minimum Specifications	Bidder Compliance (Yes/No)	Product Documentation Reference
	○ Report of vehicle flow at each of the installed locations for Last Day, Last Week and Last Month. ○ Report of vehicles in the detected categories at each of the installed locations for Last Day, Last Week and Last Month. ○ Report of Vehicle Status change in different Vehicle Categories. • The system shall have Search option to tune the reports based on license plate number, date and time, site location as per the need of the authorities. • The system shall have option to save custom reports for subsequent use. The system shall have option to export report being viewed to common format for use outside of the ANPRS or exporting into other systems. • The system should provide advanced and smart searching facility of License plates from the database. There should be an option of searching number plates almost matching with the specific number entered (up to 1 and 2 character distance)		
7.	**Vehicle Category Editor** • The system should have option to input certain license plates according to category like "Wanted", "Suspicious", "Stolen", “Expired" etc. by Authorized personnel.		

#	Minimum Specifications	Bidder Compliance (Yes/No)	Product Documentation Reference
	• The system should have an option to add new category by authorized personnel. • The system should have option to update vehicle status in specific category by authorized personnel. e.g. on retrieval of stolen vehicle, system entry should be changed from "Stolen" to "Retrieved". • System should have option to specify maximum time to retain vehicle records in specific categories.		
8.	**General Specification:** • The system should be capable of generating a video and minimum 5 snapshots in any of the standard industry formats (MJPEG, JPG, avi, mp4, mov, etc) with atleast 10 frames per second. • The system should be able to perform ANPR on all the vehicles passing the site and send alert on detection of any hot listed vehicle • The system should have ANPR/ OCR to address the alpha numeric character of irregular font sizes		
9.	**Central Management Module** • The Central Management Module shall run on the ANPR Central Server in control booth. It should be possible to view records and edit hotlists from the Central Server. **ANPR Specification** • Base Specification of Fixed Box Cameras (Section 6.2.2.2 of Annexure I) must be part of the ANPR specifications.		

#	Minimum Specifications	Bidder Compliance (Yes/No)	Product Documentation Reference
	Camera Housing • IP66 standard with sunshield vandal proof Housing		
10.	**Systems requirement** • **Local Server at Intersection:** The system shall run on a Commercial Off the Shelf Server (COTS). Outdoor IP 66 Quad core processor based server should be able to cover at least 8 lanes. Temperature rating of the server should be as per Agartla weather conditions. • **Operating system:** The system shall be based on open platform and should run on Linux or windows Operating system. • **Workstation:** Workstation shall run on latest available OS.		

6.2.2.11. Video Management System

Video management system shall constitute of a platform which will be designed for viewing, recording and replaying acquired video as part of overall project solution. This platform will be based on the Internet Protocol (IP) open platform concept. Major functionalities are described here:

VMS Overview

#	Minimum Specifications	Bidder Compliance (Yes/No)	Product Documentation Reference
1.	**Make**	<to be provided by the bidder>	
2.	**Model**	<to be provided by the bidder>	
3.	VMS shall be used for centralized management of all field camera devices, video servers and client users.		
4.	VMS server shall be deployed in a clustered server environment or		

#	Minimum Specifications	Bidder Compliance (Yes/No)	Product Documentation Reference
	support inbuilt mechanism for high availability and failover.		
5.	VMS shall support a flexible rule-based system driven by schedules and events.		
6.	VMS shall be supported for fully distributed solution for monitoring and control function, designed for limitless multi-site and multiple server installations requiring 24/7 surveillance with support for devices from different vendors.		
7.	VMS shall support ONVIF compliant internet protocol (IP) cameras.		
8.	The bidder shall clearly list in their proposal the make and models that can be integrated with the VMS, additionally all the offered VMS and cameras must have Open Network Video Interface Forum (ONVIF) compliance. VMS shall be enabled for any standard storage technologies and video wall system integration.		
9.	VMS shall be enabled for integration with any external Video Analytics Systems both server & edge based.		
10.	VMS shall be capable of being deployed in a virtualized server environment without loss of any functionality.		
11.	All CCTV cameras locations shall be overlaid in graphical map in the VMS Graphical User Interface (GUI). The		

#	Minimum Specifications	Bidder Compliance (Yes/No)	Product Documentation Reference
	cameras selection for viewing shall be possible via clicking on the camera location on the graphical map. The graphical map shall be of high resolution enabling operator to zoom-in for specific location while selecting a camera for viewing.		
12.	VMS shall have an administrator interface to set system parameters, manage codecs, manage permissions and manage storage.		
13.	VMS day-to-day control of cameras and monitoring on client workstations shall be controlled through the administrator interface.		
14.	Whilst live control and monitoring is the primary activity of the monitoring workstations, video replay shall also be accommodated on the GUI for general review and also for pre- and post-alarm recording display.		
15.	The solution design for the VMS shall provide flexible video signal compression, display, storage and retrieval.		
16.	All CCTV camera video signal inputs to the system shall be provided to various command control center(s), viewing center etc., and the transmission medium used shall best suit the relative camera deployments and access to the CCTV Network.		

#	Minimum Specifications	Bidder Compliance (Yes/No)	Product Documentation Reference
17.	VMS client shall have the capability to work with touch enabled multi-monitor workstations. It shall be capable of displaying videos in up to three (3) monitors simultaneously.		
a.	AVI files		
b.	Motion- Joint Photographic Experts Group (M-JPEG)		
c.	Moving Picture Expert Group-4 (MPEG-4)		
d.	MP4 Export or Latest		
18.	All streams to the above locations shall be available in real-time and at full resolution. Resolution and other related parameters shall be configurable by the administrator in order to provide for network constraints.		
19.	The VMS shall support field sensor settings. Each channel configured in the VMS shall have an individual setup for the following settings, the specific settings shall be determined according to the encoding device:		
20.	The VMS shall support the following operations:		
a.	Adding an IP device		
b.	Updating an IP device		

#	Minimum Specifications	Bidder Compliance (Yes/No)	Product Documentation Reference
c.	Updating basic device parameters		
d.	Adding/removing channels		
e.	Adding/removing output signals		
f.	Updating an IP channel		
g.	Removing an IP device		
h.	Enabling/disabling an IP channel		
i.	Refreshing an IP device (in case of firmware upgrade)		
j.	Multicast at multiple aggregation points		
21.	The VMS shall support retrieving data from edge storage. Thus when a lost or broken connection is restored, it shall be possible to retrieve the video from SD card and store it on central storage. System should support to view the recordings available over cameras local storage device (such as an SD card), and copy them to the server.		
22.	The VMS shall support bookmarking the videos. Thus, allowing the users to mark incidents on live and/or playback video streams.		
23.	The VMS shall allow the administrator to distribute camera load across multiple recorders and be able shift the cameras from one		

#	Minimum Specifications	Bidder Compliance (Yes/No)	Product Documentation Reference
	recorder to another by simple drag and drop facility.		
24.	VMS shall support automatic failover for recording.		
25.	VMS should also support dual recording or mirroring if required.		
26.	VMS shall support manual failover for maintenance purpose.		
27.	VMS shall support access and view of cameras and views on a smartphone or a tablet (a mobile device).		
28.	VMS shall support integration with the ANPR application.		
29.	VMS shall support integration with other online and offline video analytic applications.		
30.	VMS shall be able to accept alerts from video analytics built into the cameras, other third party systems, sensors etc.		

Client System

The Client system shall provide remote users with rich functionality and features as described below:

#	Minimum Specifications	Bidder Compliance (Yes/No)
1.	Viewing live video from cameras on the surveillance system.	
2.	Browsing recordings from storage systems.	

3.	Creating and switching between multiple of views.	
4.	Viewing video from selected cameras in greater magnification and/or higher quality in a designated hotspot.	
5.	Using digital zoom on live as well as recorded video.	
6.	Using sound notifications for attracting attention to detected motion or events.	
7.	Getting quick overview of sequences with detected motion.	
8.	Getting quick overviews of detected alerts or events.	
9.	Quickly searching selected areas of video recording for motion (also known as Smart Search).	

Remote Web Client

#	Minimum Specifications	Bidder Compliance (Yes/No)
1.	The web-based remote client shall offer live view of up to 9 cameras, including PTZ control (if applicable) and event / output activation. The Playback function shall give the user concurrent playback of multiple recorded videos with date, alert sequence or time searching.	
2.	User Authentication – The Remote Client shall support logon using the user name and password credentials	

Mobile Client

#	Minimum Specifications	Bidder Compliance (Yes/No)
1.	The bidder shall be required to provide a standardised Mobile Application to integrate smart phones and tablets for 2-way communication with the Video Management System in a secure manner. It will be responsibility of MSI to configure such tablets / Smartphone with the Surveillance System and ensure that all the necessary access is given to these mobile users.	

2.	Communication with mobile client and server shall be encrypted with Digital Certificate.	

Matrix Monitor

#	Minimum Specifications	Bidder Compliance (Yes/No)
1.	Matrix Monitor – The Matrix Monitor feature shall allow distributed viewing of multiple cameras on the system on any monitor.	
2.	The Matrix Monitor feature shall access the H.264/MJPEG/MPEG4 stream from the connected camera directly and not sourced through the recording server.	

Alarm Management Module

#	Minimum Specifications	Bidder Compliance (Yes/No)
1.	The alarm management module shall allow for continuous monitoring of the operational status and event-triggered alarms from various system servers, cameras and other devices. The alarm management module shall provide a real-time overview of alarm status or technical problems while allowing for immediate visual verification and troubleshooting.	
2.	The alarm management module shall provide interface and navigational tools through the client including;	
3.	Graphical overview of the operational status and alarms from servers, network cameras and external devices including motion detectors and access control systems.	
4.	Intuitive navigation using a map-based, hierarchical structure with hyperlinks to other maps, servers and devices or through a tree-view format.	
5.	The module shall include flexible access rights and allow each user to be assigned several roles where each shall define access rights to cameras.	

#	Minimum Specifications	Bidder Compliance (Yes/No)
6.	Basic VMS should be capable to accept third party generated events / triggers.	

Management / Integration Functionality

#	Minimum Specifications	Bidder Compliance (Yes/No)
1.	The Surveillance System shall offer centralised management of all devices, servers and users.	
2.	The Surveillance System should not have any limit on the number of cameras to be connected for Surveillance, Monitoring and Recording. Any increase in the no. of cameras should be possible by augmentation of Hardware components.	
3.	The Surveillance System shall support distributed viewing of any camera in the system using Video walls or big screen displays.	
4.	The Surveillance System shall support alarm management. The alarm management shall allow for the continuous monitoring of the operational status and event-triggered alarms from system servers, cameras and other external devices.	
5.	It should be possible to integrate the Surveillance System with 3rd-party software, to enable the users to develop customized applications for enhancing the use of video surveillance solution. For e.g., integrating alarm management to initiate SMS, E-Mail, VoIP call, etc.	
6.	The Management system shall store the overall network elements configuration in central database, either on the management server computer or on a separate DB Server on the network.	
7.	System should be able to be integrated with Event Management / Incident Management System.	

System Administration Functionality

#	Minimum Specifications	Bidder Compliance (Yes/No)
1.	The System Administration Server shall provide a feature-rich administration client for system configuration and day-to-day administration of the system.	
2.	The System Administration Server shall support different logs related to the Management Server. • The System Log • The Audit Log • The Alert Log • The Event Log	
3.	Rules: The system shall support the use of rules to determine when specific actions occur. Rules shall define what actions shall be carried out under specific conditions. The system shall support rule initiated actions such as: • Start and stop recording • Set non-default live frame rate • Send notifications via email • Pop-up video on designated Client Monitor recipients	

Other Miscellaneous Requirements

#	Minimum Specifications	Bidder Compliance (Yes/No)
1.	System should have a facility to create CDs or other storage media for submission to Judiciary, which can be treated evidence for legal matters. Such storage media creation should be tamper proof and MSI to provide appropriate technology so that integrity and quality of evidence is maintained as per requirements of the judiciary. Bidder is required to specify any additional hardware / software required for this purpose & the same can be listed in Miscellaneous section of the commercial bid. The bidder shall also prepare the guideline document to be followed by the Police Personnel for the retrieval of Video / images from the CCTV System so as to maintain integrity of the evidence. Such a guideline document should include methods of	

#	Minimum Specifications	Bidder Compliance (Yes/No)
	retrieval of data, check-list to be followed and flowchart of the entire process to be followed.	
2.	All the systems proposed and operationalization of Video Management System should comply with requirements of IT Acts.	
3.	Security Platform shall have strong security mechanism such as the use of advance encryption/digital certificates/ authentication to ensure that only authorized personnel have access to critical information, prevent man-in-the-middle attacks, and that the data is kept private.	
4.	System should ensure that once recorded, the video cannot be altered, ensuring the audit trail is intact for evidential purposes.	

Major Server components for VMS

Video Management Server(s)	Video Management System Servers shall maintain coherent operations between all servers and workstations. It shall host Control Center, where the system is administered, and System database. It shall monitor one or more Recorder servers on separate dedicated computers, storage devices, IP-compatible devices, and one or more workstation. All network communication shall also be performed via the Video Management servers.
Video Recording Server(s)	The Video Recorder Server shall be a dedicated server that shall store and processes video with the help of Video Management System
Video Analytics Server (s)	Video Analytics Software shall be installed in the Video Analytics Server, Video Analytics is a software product that shall analyse live video in real-time to detect, identify, and track objects of interest. It shall automatically issue alerts to the appropriate personnel and initiate appropriate follow-up action according to pre-defined rules. This software shall also manage sensors; each sensor shall monitor a single video feed for security events. The video feeds shall be connected over the network to the Video Analytics Server. Sensors on the Video Analytics Server shall perform all event detection functions.
Web Server(s)	It shall be used to launch the client application remotely through web browsers.
Gateway Server (s) – If required	A Media Gateway server shall be used to establish remote connections to review and transcode the video. Standalone Media Gateway servers shall also be installed on separate machines. Standalone servers shall be recommended for such large systems that shall transfer video data to remote clients.

6.3. Traffic Enforcement System

The functional requirements and technical specifications provided in the below sections are indicative and carry guiding rule. The MSI is free to offer products and solutions which meet requirements of the RFP focusing on the outcome, future scalability, security, reliability and adherence to specified SLA under this RFP, in line with applicable standards & best practices adopted in the industry. The MSI is encouraged to design an Optimised solution which is technically superior, innovative, proven, better in terms of functionality and is cost effective. Any specified parameters mentioned in the scope/technical requirement in the RFP may be considered if it is required for meeting current & future requirements during the contract period. The MSI is fully responsible for the specified outcome to be achieved.

6.3.1. Functional Requirement – Traffic Enforcement System

6.3.1.1. Red Light Violation Detection System

#	Minimum Specifications	Bidder Compliance (Yes/No)	Product Documentation Reference
1	**Make**	<to be provided by the bidder>	
2	**Model**	<to be provided by the bidder>	
3	**General**		
a.	The following Traffic violations to be automatically detected by the system by using appropriate Non-Intrusive sensors technology: The system should have both provisions to detect red light status by taking the signal feed from the traffic signal controller as well as by video analytics method using another camera (Evidence Camera) focused at the red light. The Evidence camera should also be used for evidence snap generation. a) Red Light Violation b) Stop Line Violation		
b.	The system should be capable of capturing multiple infracting vehicles simultaneously in Different lanes on each arm at any point of time with relevant infraction data like: a) Type of Violation b) Date, time, Site Name and Location of the Infraction c) Registration Number of the vehicle through ANPR Camera system for each vehicle identified for infraction.		

#	Minimum Specifications	Bidder Compliance (Yes/No)	Product Documentation Reference
c.	The system should be equipped with a camera system to record a digitized image and video of the violation, covering the violating vehicle with its surrounding and current state of signal (Red/Green/Amber) by which the system should clearly show nature of violation and proof thereof :- a) When it violates the stop line. b) When it violates the red signal. c) Besides, a closer view indicating readable registration number plate patch of the violating vehicle for court evidence for each violation. The system shall have in-built tool to facilitate the user to compose detail evidence by stitching video clips from any IP camera in the junction (including but not limited to the red light violation detection camera, evidence camera), and any other surveillance cameras in the vicinity of the spot of incidence. The entire evidence should be watermarked and encrypted to stand the court of law.		
d.	The system shall be able to detect all vehicles infracting simultaneously in each lane/ arm at the junction as per locations provided. It should also be able to detect the vehicles infracting serially one after another in the same lane. The vehicles should be clearly identifiable and demarcated in the image produced by the camera system.		
e.	The Evidence image produced by the system should be wide enough to give the exact position of the infracting vehicles with respect to the stop line and clearly indicate colour of the Traffic light at the instant of Infraction even if any other means is being used to report the colour of the light.		
f.	The system should interface with the traffic controller to validate the colour of the traffic signal reported at the time of Infraction so as to give correct inputs of the signal cycle.		

#	Minimum Specifications	Bidder Compliance (Yes/No)	Product Documentation Reference
g.	The Evidence and ANPR camera should continuously record all footage in its field of view to be stored at the local base station. This should be extractable onto a portable device as and when required. The option of live viewing of evidence cameras from the locations shall be available at the ICCC. The network should have the capability to provide the real time feed of the evidence camera to the ICCC at the best resolution possible on the available network.		
h.	The system shall be equipped with IR Illuminator to ensure clear images including illumination of the Number Plate and capture the violation image under low light conditions and night time.		
4	**Recording & display information archive medium**		
a.	The recording and display of information should be detailed on the snapshot of the infracting vehicle as follows:		
b.	Computer generated unique ID of each violation		
c.	Date (DD/MM/YYYY)		
d.	Time (HH:MM:SS)		
e.	Equipment ID		
f.	Location ID		
g.	Carriageway or direction of violating vehicle		
h.	Type of Violation (Signal/Stop Line)		
i.	Lane Number of violating vehicle		
j.	Time into Red/Green/Amber		
k.	Registration Number of violating vehicle		
5	**On site-out station processing unit communication & Electrical Interface**		
a.	The system should automatically reset in the event of a program hang up and restart on a button press. However the system should start automatically after power failure.		
b.	The system should have secure access mechanism for validation of authorised personnel.		

#	Minimum Specifications	Bidder Compliance (Yes/No)	Product Documentation Reference
c.	Deletion or addition and transfer of data should only be permitted to authorised users.		
d.	A log of all user activities should be maintained in the system.		
e.	Roles and Rights of users should be defined in the system as per the requirements of the client		
f.	All formats of the stored data with respect to the infractions should be Non Proprietary.		
g.	The communication between the on-site outstation processing unit housed in the junction box and the detection systems mounted on the cantilever shall be through appropriate secured technology.		
h.	The system should have the capability to transfer the data to ICCC through proper encryption in real time and batch mode for verification of the infraction and processing of challan. Call forwarding architecture shall be followed to avoid any data loss during transfer.		
i.	In the event that the connectivity to the ICCC is not established due to network/connectivity failures, then all data pertaining to the infraction shall be stored on site and will be transferred once the connectivity is re-established automatically. There shall also be a facility of physical transfer of data on portable device whenever required. There should be a provision to store minimum **one week** of data at each site on a 24x7 basis.		
6	**Mounting structure**		
a.	Should be cantilever mounted and shall have minimum 6 Mtrs. height with appropriate vertical clearance under the system from the Road surface to ensure no obstruction to vehicular traffic.		
b.	It should be capable to withstand high wind speeds and for structural safety, the successful bidder has to provide structural safety certificate from qualified structural engineers approved/ certified by Govt. Agency.		

#	Minimum Specifications	Bidder Compliance (Yes/No)	Product Documentation Reference
c.	It shall be painted with one coat of primer and two coats of PU paint. The equipment including poles, mountings should have an aesthetic feel keeping in mind the standards road Infrastructure (e.g Poles, Navigation boards etc) currently installed at these locations. The equipment should look "one" with the surroundings of the location and not look out of place.		
d.	Rugged locking mechanism should be provided for the onsite enclosures and cabinets.		
7	**RLVD Application**		
a.	It should be capable of importing violation data for storage in database server which should also be available to the Operator for viewing and retrieving the violation images and data for further processing. The programme should allow for viewing, sorting, transfer & printing of violation data.		
b.	It should generate the photograph of violations captured by the outstation system which include a wider view covering the violating vehicle with its surrounding and a closer view indicating readable registration number plate patch of the violating vehicle or its web link on notices for court evidence.		
c.	All outstation units should be configurable using the software at the Central Location.		
d.	Violation retrieval should be sorted by date, time, location and vehicle registration number and the data structure should be compatible with Tripura/ Agartala Police database structure. It should also be possible to carry out recursive search and wild card search.		
e.	The operator at the back office should be able to get an alarm of all fault(s) occurring at the camera site (e.g. sensor failure, camera failure, failure of linkage with traffic signal, connectivity failure, Camera tampering, sensor tampering).		
f.	The automatic number plate recognition Software shall be part of the supplied system, Success rate of		

#	Minimum Specifications	Bidder Compliance (Yes/No)	Product Documentation Reference
	ANPR shall be taken as 80% or better during the day time and 60% or better during the night time with a standard number plate.		
g.	The application software should be integrated with the E-Challan software for tracing the ownership details of the violating vehicle and issuing/printing notices. Any updates of the software (OS, Application Software including any proprietary software), shall be updated free of cost during the contract period by the MSI.		
h.	Image zoom function for number plate and images should be provided. In case the number plate of the infracting vehicle is readable only through the magnifier then in such cases the printing should be possible along with the magnified image.		
i.	Various users should be able to access the system using single sign on and should be role based. Different roles which should be defined (to be finalized at the stage of SRS) could be Administrator, Supervisor, Officer, Operator, etc.		
j.	Apart from role based access, the system should also be able to define access based on location.		
k.	Rights to different modules / Sub-Modules / Functionalities should be role based and proper log report should be maintained by the system for such access.		
l.	Components of the architecture should provide redundancy and ensure that there are no single points of failure in the key project components. Considering the high sensitivity of the system, design shall be in such a way as to be resilient to technological sabotage. To take care of remote failure, the systems need to be configured to mask and recover with minimum outage.		

#	Minimum Specifications	Bidder Compliance (Yes/No)	Product Documentation Reference
m.	The architecture should adopt an end-to-end security model that protects data and the infrastructure from malicious attacks, theft etc. Provisions for security of field equipment as well as protection of the software system from hackers and other threats shall be a part of the proposed system. Using Firewalls and Intrusion detection systems such attacks and theft shall be controlled and well supported (and implemented) with the security policy. The virus and worms attacks shall be well defended with Gateway level Anti-virus system, along with workstation level Anti-virus mechanism. There shall also be an endeavour to make use of the SSL/VPN technologies to have secured communication between Applications and its end users. Furthermore, all the system logs shall be properly stored & archived for future analysis and forensics whenever desired.		
n.	The evidence of Infraction should be encrypted and protected so that any tampering can be detected.		
o.	Ease of configuration, ongoing health monitoring, and failure detection are vital to the goals of scalability, availability, and security and must be able to match the growth of the environment.		
p.	System shall use open standards and protocols to the extent possible and declare the proprietary software wherever used.		
q.	The user interface should be user friendly and provide facility to user for viewing, sorting and printing violations. The software should also be capable of generating query based statistical reports on the violation data.		
r.	The data provided for authentication of violations should be in an easy to use format as per the requirements of user.		
s.	User should be provided with means of listing the invalid violations along with the reason(s) of invalidation without deleting the record(s).		

#	Minimum Specifications	Bidder Compliance (Yes/No)	Product Documentation Reference
t.	Basic image manipulation tools (zoom etc.) should be provided for the displayed image but the actual recorded image should never change.		
u.	Log of user actions be maintained in read only mode. User should be provided with the password and ID to access the system along with user type (admin, user).		
v.	Image should have a header/footer depicting the information about the site IP and violation details like date, time, equipment ID, location ID, Unique ID of each violation, lane number, Regn. Number of violating vehicle and actual violation of violating vehicle etc. so that the complete lane wise junction behaviour is recorded including (Red Light violation and Stop Line Violation)		
w.	Number plate should be readable automatically by the software/interface. There should be user interface for simultaneous manual authentication / correction and saving as well.		
x.	Interface for taking prints of the violations (including image and above details).		

6.3.1.2. E Challan System application

#	Minimum Requirements	Bidder Compliance(Yes/No)	Product Documentation Reference
A.	**Make**	<to be provided by the bidder>	
B.	**Model**	<to be provided by the bidder>	
C.	**General**		
1.	E-challan software shall work in client - server mode, where 30 handheld devices units will act as clients connected to the server through cellular network for data transfer. The system should be scalable to 500 devices, which may be added later on, server requirements to be calculated as per		

#	Minimum Requirements	Bidder Compliance(Yes/No)	Product Documentation Reference
	scalability for 500 devices, which may be added later on.		
2.	E-challan system shall be able to retrieve vehicle owners details and vehicle data from RTO data base to minimise data entry		
3.	Server should maintain log of all current devices. Any access to the system must be recorded along with date, time, user id and IP address		
4.	Traffic officer should log in to the hand held device through the unique user id and pass word or smart card issued for the purpose		
5.	A unique challan number should be generated through client software for each challan		
6.	As soon as a vehicle registration number is entered , the handheld device should automatically check from the server if the vehicle is stolen , wanted in any criminal case or is in the list of suspicious vehicle		
7.	The most frequent traffic offences should be kept at the top in the drop down menu and offence ingredients should be available if required by officer		
8.	Date, time and GPS coordinates of place of challan should be automatically populated in the relevant fields of client software		
9.	Compounding amount must populate in the field automatically from master table		
10.	The successful bidder should develop the GUI and functionality as per requirements of the Agartala Police		

#	Minimum Requirements	Bidder Compliance(Yes/No)	Product Documentation Reference
11.	The GUI should be lingual i.e English and local state language		
12.	It should be possible to integrate payment gate way operator with the system for felicitation of payment		
D.	**Handheld Device Software**		
13.	Once the application is loaded on the hand-held device there should be no possibilities to modify the application by the user. Reloading and modifying of application should be possible only by an administrator.		
14.	On switching on the hand-held device the system must give access only after validation through user ID and password.		
15.	The communication between the server and hand-held device would be through GSM/GPRS/ 3G/4G or better connectivity etc.		
16.	Every challan created should have a unique self-populated number.		
17.	The Handheld application shall be able to access information from the main Server and display upon request, pop- up tables/codes, vehicle and license details, all types of offences, compounding amount, challan types, vehicle details, court calendar etc. in order to minimize the typing by the prosecuting officer.		
18.	The Handheld device should be able to access data/ information on the basis of driving license number, vehicle registration number etc. from the main server data relating to previous offences.		

#	Minimum Requirements	Bidder Compliance(Yes/No)	Product Documentation Reference
19.	The hand-held application software should also suggest date of challan, place of challan, name of the Court and court date etc. to further reduce typing by the officer. These fields should be designed in consultation with Agartala Police.		
20.	When a challan is issued, the name and ID of the officer should be printed on the challan.		
21.	The Handheld device shall be able to input and print multiple offences on the same challan.		
22.	The Handheld software shall validate challan fields automatically before the challan is printed. The system shall ensure that certain fields are properly completed before allowing the challan to be printed.		
23.	When downloading application software or pop-up tables or lists to the Handheld, or uploading challan records to the Server, synchronization of Handheld system must be automatic, in order to minimize human intervention.		
24.	Uploading data to the Database Server should be automatic in consistent manner.		
25.	The application should provide features wherein when a driving license/ vehicle registration number is entered; it should be able to pull from the server all the details relating to the driving license holder/ vehicle owner including history of previous offences.		
26.	Software should capture the list of documents seized during prosecution and		

#	Minimum Requirements	Bidder Compliance(Yes/No)	Product Documentation Reference
	such list must be reflected on the printed court challan.		
27.	The handheld application software shall allow the user to generate a summary report to facilitate evaluation of his daily work.		
28.	Once the challan is complete and saved any further editing should not be possible unless so authorized by administrator.		
29.	Each hand-held device should be provided with original printed user manual and appropriate carry case for Handheld device with charger.		
30.	The application software should allow online payment		
31.	There should be automatic rejection of payment for the settlement of expired notices or challans. Partial payment of an offence shall not be accepted by the system.		
32.	The software should update DL/RC smart card with the booked offence.		
E.	**E-Challan Application Software**		
33.	The Application Software should work in a web based environment.		
34.	The application software should be user friendly, easy to operate even by police personnel with minimum qualification of that of a head constable.		
35.	The software shall provide comprehensive data back-up and restoration capability.		

#	Minimum Requirements	Bidder Compliance(Yes/No)	Product Documentation Reference
36.	The system shall function in web-based system where the hand-held device shall work as a node.		
37.	The application software should maintain the logs of user activities to facilitate the audit trail.		
38.	The system should have sufficient security features such as biometrics, password protection, audit trail, etc.		
39.	The system should be able to handle the activities of all the handheld devices at one time simultaneously with huge database size of prosecution, ownerships, driving license etc. without affecting the performance.		
40.	The software should be able to generate various periodical reports, summaries, MIS reports, query reply etc. as per the requirements of Agartala Police.		
41.	Administrator should be able to modify the master tables as and when required and should have the capability to push the changes to hand-held devices.		
42.	Software up-gradation should be provided by the MSI from time to time as per available technology without further cost impact to Agartala Police.		
43.	The Department will provide the entire data of vehicle ownership and driving license for integration with the vendor's application software.		

#	Minimum Requirements	Bidder Compliance(Yes/No)	Product Documentation Reference
44.	All database tables, records etc. required for various dropdown menus etc. shall also be created by the MSI.		
45.	The application software shall be provided by the MSI to handle various processes of the prosecution required by the office of senior police officers, Courts etc.		
46.	The application software should have the capability to export records in CSV, SQL and binary format		

6.3.1.3. Traffic Accident Reporting System

#	Minimum Requirements	Bidder Compliance(Yes/No)	Product Documentation Reference
A.	**Make**	<to be provided by the bidder>	
B.	**Model**	<to be provided by the bidder>	
C.	**General**		
1.	Traffic Accident Reporting System should be able to provide: • Accident reporting system • Accident recording system • Video Analytics of accidents		
2.	MSI to provide accident database that will support collecting high quality information on all aspects of road traffic collisions		
3.	The system should allow AMC/ Traffic Police department to quick and accurate analysis of information. Authority on basis of analysis be able to control accidents in future		
4.	Information to be captured shall include, but not limited to:		

#	Minimum Requirements	Bidder Compliance(Yes/No)	Product Documentation Reference
	• How the accident happened • Details of vehicle involved • Extent of human impact • Cause of accident • Nature of injury • Extent of property damage • Incident photos • Information on analysis agency and personnel		
5.	MSI should provide appropriate field devices to support Traffic Accident Reporting system gather information from the field		
6.	Field device should satisfy following requirement • Similar form factor • Easy to use and carry • Touch Based and Rugged • Battery shall last for maximum period • Preloaded user forms to be filled by Police • Location accuracy upto 3 mtrs. • Ability to save photos of the incident		
7.	The Accident database and information should be integrated with ICCC		

6.3.2. Technical Specification – Traffic Enforcement System

6.3.2.1. Red Light Violation Detection Systems

#	Parameter	Minimum Specifications	Bidder Compliance (Yes/No) (Yes/No)	Product Documentation Reference
1.	**Make**	<to be provided by the bidder>		
2.	**Model**	<to be provided by the bidder>		
3.	**General**			
	The system should be capable of generating a video & minimum 3 snapshot in any of the standard industry formats (MJPEG, JPG, avi, mp4, mov, etc) with at least 10 frames per second. The video shall be from t-5 to t+5 sec of the violation and should also be recorded (being the instant at which the infraction occurred).			
4.	**Digital Network Camera**			
a.	Video Compression	H.264		
b.	Video Resolution	1920 X 1080		
c.	Frame rate	Min. 30 fps		
d.	Image Sensor	1/3” Progressive Scan CCD / CMOS		
e.	Lens Type	Varifocal, C/CS Mount, IR Correction full HD lens		
f.	Lens#	Auto IRIS 5~50mm /8 – 40 mm, F1.4		
g.	Minimum Illumination	Colour: 0.5 lux, B/W: 0.1 lux (at 30 IRE)		
h.	IR Cut Filter	Automatically Removable IR-cut filter		
i.	Day/Night Mode	Colour, Mono, Auto		
j.	S/N Ratio	≥ 50 Db		
k.	Auto adjustment + Remote Control of Image settings	Colour, brightness, sharpness, contrast, white balance, exposure control, backlight compensation, Gain Control, Ture Wide Dynamic Range		
l.	Local storage	Minimum 64 GB Memory card in a Memory card slot. In the event of failure of connectivity to the central server the camera shall		

#	Parameter	Minimum Specifications	Bidder Compliance (Yes/No) (Yes/No)	Product Documentation Reference
		record video locally on the SD card automatically. After the connectivity is restored these recordings shall be automatically merged with the server recording such that no manual intervention is required to transfer the SD card based recordings to server.		
m.	Protocol	IPV4, IPV6, HTTP, HTTPS, FTP/SMTP, RTSP, RTP, TCP, UDP, RTCP, DHCP, UPnP, NTP, QoS, ONVIF Profile S		
n.	Security	Password Protection, IP Address filtering, User Access Log, HTTPS encryption		
o.	Operating conditions	As per Agartala weather conditions		
p.	Casing	NEMA 4X / IP-66, IK10 rated		
q.	Intelligent Video	Motion Detection & Tampering alert		
r.	Alarm I/O	Minimum 2 Input & 1 Output contact for 3rd part interface		
s.	Certification	UL/EN, CE,FCC		
5.	**On site-out station processing unit communication & Electrical Interface (Junction Box)**			
a.	Data Storage on site	The system should be equipped with appropriate storage capacity for 7 days 24X7 recording, with overwriting capability. The images should be stored in tamper proof format only.		

#	Parameter	Minimum Specifications	Bidder Compliance (Yes/No) (Yes/No)	Product Documentation Reference
b.	Network Connectivity	Wired/GPRS based wireless technology with 3G upgradable to 4G capability.		
c.	Minimum 2(two) USB Port to support the latest external mass storage devices and Ethernet (10/100) Port for possible networking. However all logs of data transfer through the ports shall be maintained by the system.			
d.	The system should be capable of working in ambient temperature as per Agartala weather conditions.			
e.	Lightening arrester shall be installed for safety of system (As per BIS standard IS 2309 of 1989).			
f.	The housing(s) should be capable of withstanding vandalism and harsh weather conditions and should meet IP66, IK10 standards (certified).			
6.	**Violation Transmission and Security**			
a.	Encrypted data, images and video pertaining to Violations at the Onsite processing station should be transmitted to the ICCC electronically through GPRS based wireless technology with 3G upgradable to 4G, or wired connectivity if available in Jpeg format			
b.	Advanced Encryption Standard (AES) shall be followed for data encryption on site and ICCC, and its access will protected by a password.			
c.	The vendor shall ensure that the data from the onsite processing unit shall be transferred to ICCC within one day.			
7.	**Video Recording**			

#	Parameter	Minimum Specifications	Bidder Compliance (Yes/No) (Yes/No)	Product Documentation Reference
a.	The system should be capable of continuous video recording in base station for 7 days. The system shall automatically overwrite the data after 7 days. It should be noted that at any point of time the local storage at the base station should have the data of previous 7 days.			
b.	Direct extraction through any physical device like USB flash drive , Portable Hard disk etc. shall be possible			

6.3.2.2. E Challan Handheld device

Sr. No.	Parameter	Minimum Specifications	Bidder Compliance (Yes/No)	Product Documentation Reference
1	**Make**	<to be provided by the bidder>		
2	**Model**	<to be provided by the bidder>		
3	**Core Board**			
A	Operating System	Latest Windows, Linux or Android OS		
B	Processor	Min 800 MHz		
C	Memory (Flash ROM)	Minimum 512 MB		
D	RAM	256 MB Min		
E	Extend Slot	Micro SD 32 GB		
4	**Motherboard**			
A	Display	Minimum 3.5 inch TFT LCD (Trans reflective screen VGA/QVGA)		
B	Touch Screen	Yes		

Sr. No.	Parameter	Minimum Specifications	Bidder Compliance (Yes/No)	Product Documentation Reference
C	Form Factor	Any		
D	GPS	GPS and A GPS		
E	Bluetooth	Yes		
F	Wifi	WiFi (802.11 b/g/n)		
G	Thermal Printer	Direct thermal line printing 3 inch		
H	Barcode scanner	1D and 2 Scanner		
I	External Interface	USB HOST/RS232(Customized)		
J	Protection class	IP54		
K	Drop resistance level	1.5m		
5	**Camera**			
A	Camera	3 MP Min		
B	Camera- Video	Support still image and video capture		
6	**Keypad**			
A	Front	QWERTY 42 Keys function key can be soft key		
7	**Interface**			
A	Mini-USB Connector	USB2.0 connection		
B	SIM card slot	Yes		
C	TF card slot	Yes		
D	power jack	Yes		

Sr. No.	Parameter	Minimum Specifications	Bidder Compliance (Yes/No)	Product Documentation Reference
E	Audio Jack	Yes		
8	**General**			
A	Battery Type	Rechargeable Li-ion battery 3000mAh		
B	Operating temperature	As per Agartala weather conditions		
C	Storage temperature	As per Agartala weather conditions		
D	Operating humidity	As per Agartala weather conditions		
E	Storage humidity	As per Agartala weather conditions		
F	Payment PINPAD	The device should have lPCI , EMV certified PINPAD as per RBI guideline for accepting payment through Credit / Debit card		
G	Enclosure	Rugged		

6.4. Variable Message Display (VMD) System

The MSI shall presently install IP based VMS boards at identified locations in the city of Agartala. These VMD boards shall have different characteristics depending upon the location and purpose of installation. VMD board displays are to be controlled by personnel from the ICCC. The purpose of the VMD boards is to provide the commuters with information about traffic conditions and alternate routes in case of high traffic on roads

The functional requirements and technical specifications provided in the below sections are indicative and carry guiding rule. The MSI is free to offer products and solutions which meet requirements of the RFP focusing on the outcome, future scalability, security, reliability and adherence to specified SLA under this RFP, in line with applicable standards & best practices adopted in the industry. The MSI is encouraged to design an Optimised solution which is technically superior, innovative, proven, better in terms of functionality and is cost effective. Any specified parameters mentioned in the scope/technical requirement in the RFP may be considered if it is required for meeting current & future requirements during the contract period. The MSI is fully responsible for the specified outcome to be achieved.

6.4.1. Functional Requirements of the Variable Message Display (VMD) System

#	Minimum Specifications	Bidder Compliance (Yes/No)	Product Documentation Reference
1	**Make**	<to be provided by the bidder>	
2	**Model**	<to be provided by the bidder>	
3	**System Requirements**		
a.	The system should be capable to display warnings, traffic advice, route guidance and emergency messages to motorists from the ICCC in real time.		
b.	The system should also be capable to display warnings, traffic advice, route guidance and emergency messages to motorist by using local PC/Laptops.		
c.	The VMD should display text and graphic messages using Light Emitting Diode (LED) arrays.		
d.	The System should able to display failure status of any LED at ICCC.		
e.	The System should support Display characters in true type fonts and adjustable based on the Operating system requirement.		

#	Minimum Specifications	Bidder Compliance (Yes/No)	Product Documentation Reference
f.	The VMD workstation at the ICCC should communicate with the VMD controller through the network. It should send out command data to the variable message display controller and to confirm normal operation of the signboard. In return, the VMD workstation should receive status data from the VMD controller.		
g.	VMD controllers should continuously monitor the operation of the VMD via the provided communication network.		
h.	Operating status of the variable message display should be checked periodically from the ICCC		
i.	It shall be capable of setting an individual VMD or group of VMD's to display either one of the pre-set messages or symbols entered into the computer via the control computer keyboard or by another means.		
j.	It shall be capable of being programmed to display an individual message to a VMD or a group of VMD's at a pre-set date and time.		
k.	A sequence of a minimum of 10 messages/pictures/ pre-decided sign or group of signs shall be possible to assign for individual VMD or group of VMD's.		
l.	It shall also store information about the time log of message displayed on each VMD. The information stored shall contain the identification number of the VMD, content of the message, date and time at which displayed message/picture starts and ends.		
m.	The central control computer shall perform regular tests (pre-set basis) for each individual VMD. Data communication shall be provided with sufficient security check to avoid unauthorized access.		
4	**Variable Message Displays (VMD) application**		
a.	Central Control Software allows controlling multiple VMD from one console.		

#	Minimum Specifications	Bidder Compliance (Yes/No)	Product Documentation Reference
b.	Capable of programming to display all types of Message/ advertisement having alphanumeric character in English, Hindi, Bengali (any other language asked by ASCL) and combination of text with pictograms signs. The system should have feature to manage video / still content for VMD. The system should have capability to divide VMD screen into multi-parts to display diverse form of information like video, text, still images, advertisements, weather info, city info etc. The system should also provide airtime management and billing system for paid content management		
c.	Capable of controlling and displaying messages on VMD boards as individual/ group.		
d.	Capable of controlling and displaying multiple font types with flexible size and picture sizes suitable as per the size of the VMD.		
e.	Capable of controlling brightness & contrast through software.		
f.	Capable to continuously monitor the operation of the Variable Message Display board, implemented control commands and communicate information to the ICCC via communication network.		
g.	Real-time log facility – log file documenting the actual sequence of display to be available at central control system.		
h.	Multilevel event log with time & date stamp.		
i.	Access to system only after the authentication and acceptance of authentication based on hardware dongle with its log.		
j.	Location of each VMD will be plotted on GIS Map with their functioning status which can be automatically updated.		
k.	Report generation facility for individual/group/all VMDs with date and time which includes summary of messages, dynamic changes, fault/repair report and system accessed		

#	Minimum Specifications	Bidder Compliance (Yes/No)	Product Documentation Reference
	logs, link breakage logs, down time reports or any other customized report.		
l.	Configurable scheduler on date/day of week basis for transmitting pre-programmed message to any VMD unit.		
m.	Various users should access the system using single sign on and should be role based. Different roles which could be defined (to be finalized at the stage of SRS) could be Administrator, Supervisor, Officer, Operator, etc.		
n.	Apart from role based access, the system should also be able to define access based on location.		
o.	Rights to different modules / Sub-Modules / Functionalities should be role based and proper log report should be maintained by the system for such access		
p.	Components of the architecture should provide redundancy and ensure that there are no single points of failure in the key project components. To take care of remote failure, the systems need to be configured to mask and recover with minimum outage.		
q.	The architecture should adopt an end-to-end security model that protects data and the infrastructure from malicious attacks, theft, natural disasters etc. provisions for security of field equipment as well as protection of the software system from hackers and other threats shall be a part of the proposed system. Using Firewalls and Intrusion detection systems such attacks and theft shall be controlled and well supported (and implemented) with the security policy. The virus and worms attacks shall be well defended with Gateway level Anti-virus system, along with workstation level Anti-virus mechanism. There shall also be an endeavour to make use of the SSL/VPN technologies to have secured communication between Applications		

#	Minimum Specifications	Bidder Compliance (Yes/No)	Product Documentation Reference
	and its end users. Furthermore, all the system logs shall be properly stored & archived for future analysis and forensics whenever desired.		
r.	Ease of configuration, ongoing health monitoring, and failure detection are vital to the goals of scalability, availability, and security and should be able to match the growth of the environment.		
s.	System shall use open standards and protocols to the extent possible		
t.	Facility to export reports to excel and PDF formats.		
3.	**Remote Monitoring**		
a.	All VMD shall be connected/configured to ICCC for remote monitoring through network for two way communication between VMD and control Room to check system failure, power failure & link breakage.		
b.	Remote Diagnostics to allow identifying failure up to the level of failed individual LED.		

6.4.2. Technical Specifications: Variable Message Display (VMD) System

#	Parameter	Minimum Specifications	Bidder Compliance (Yes/No)	Product Documentation Reference
1.	**Make**		<to be provided by the bidder>	
2.	**Model**		<to be provided by the bidder>	
3.	**Dimensions**	Minimum 3.0m length X 1.5m height X 0.2m depth. (3000mm x 1500mm X 200mm approx)		
4.	**Colour LED**	Full Colour, class designation C2 as per IRC/EN 12966 standard		
5.	**Luminance Class/Ratio**	L3 as per IRC/EN 12966 standards.		

#	Parameter	Minimum Specifications	Bidder Compliance (Yes/No)	Product Documentation Reference
6.	**Luminance Control & auto Diming**			
a.	Should be automatically provide different luminance levels but shall also be controllable from the traffic centre using software.			
b.	Should have auto dimming capability to adjust to ambient light level (sensor based automatic control)			
c.	Photoelectric sensor shall be positioned at the Display front and Display rear to measure ambient light. Capable of being continually exposed to direct sunlight without impairment of performance.			
7.	**Contrast Ratio**	R3 as per IRC/EN 12966 standard		
8.	**Beam Width**	B6+ as per IRC/EN12966 standards.		
9.	**Pixel Pitch**	12mm or better		
10.	**Picture Display**			
d.	At least 300mm as per IRC /EN 12966 standards			
e.	Full Matrix: Number of lines & characters adjustable, active area: 2.88mX1.2m atleast			
f.	Synchronized Dot to Dot display.			
a.	Capable of displaying real time message generated by ICCC.			
b.	Special frontal design to avoid reflection.			
c.	Display shall be UV resistant			
11.	**Viewing Angle**	B6+ as per IRC/EN12966 standard- Viewing angle shall ensure message readability for		

#	Parameter	Minimum Specifications	Bidder Compliance (Yes/No)	Product Documentation Reference
		motorists in all lanes of the approach road		
12.	**Viewing Distance**	Suitable for readability from 150 Mtrs. or more at the character size of 240mm, from moving vehicles.		
13.	**Self-Test**			
a.	VMD shall have self-test diagnostic feature to test for correct operation.			
b.	Display driver boards shall test the status of all display cells in the Display board even when diodes are not illuminated.			
c.	All periodic self-test results shall be relayed to the ICCC in real time to update the status of the VMD			
14.	**Alarms**			
a.	Door Open sensor to Inform Control room during unauthorized access			
b.	LED Pixel failure detection alarm			
15.	**Flicker**	Refresh Frequency should not be less 90 Hz. No visible flicker to naked eye.		
16.	**Multiple Data Communication interface/Port**	RJ45 Ethernet, RS232, RS 485, FC port and any other suitable		
17.	**Communication (connectivity)**	Wired & GPRS based wireless technology with 3G upgradable to 4G capability.		

#	Parameter	Minimum Specifications	Bidder Compliance (Yes/No)	Product Documentation Reference
18.	**Ambient Operating Temperature**	The system should be capable of working in ambient temperature as per Agartala weather conditions.		
19.	**Humidity (RH)**	Operating ambient humidity should be as per Agartala weather conditions		
20.	**Protection against Pollution/dust/ water**	Complete VMD should be of IP 65 protection level from front and IP54 from side and rear. As per EN60529 or equivalent Standard.		
21.	**Power**			
a.	Preferably 170-250V AC (more than 90% power factor) or DC as per equipment requirement.			
b.	Protection for overvoltage/ fluctuation/drop of the nominal voltage (50%) shall be incorporated.			
c.	The enclosure shall contain at least two 15 Amp VAC (industrial grade) outlet socket for maintenance purpose.			
22.	**Power Back-up & its enclosure**	Should have UPS provisioning as per SLA requirements. The enclosure of UPS and battery should be pole mountable with IP 65 protected housing and lockable.		
23.	**Material for VMD frame**	Preferably at least 2mm aluminum or Non-corrosive, water resistant or better. Frame of the VMD should be black & Powder coated.		
24.	**Mounting, Installation and finishes**			
a.	Mounting structure shall use minimum 6Mtrs. High Cylindrical GI Pole (Class B) or suitable structure			

#	Parameter	Minimum Specifications	Bidder Compliance (Yes/No)	Product Documentation Reference
	with 5.5 mtr. Minimum vertical clearance under the VMD from the Road surface.			
b.	The mounting shall be capable of withstanding road side vibrations at site of installation.			
c.	It shall be provided with suitable walkway for maintenance access.			
d.	The sides interior and rear of enclosures shall be provided in maintenance free natural aluminium finish. All enclosure shall be flat and wipe clean.			
e.	Rugged locking mechanism should be provided for the onsite enclosures and cabinets.			
f .	For Structural safety, the successful bidder has to provide structural safety certificate from qualified structural engineers approved/ certified by Govt. Agency.			
25.	**Wind Load**	As per the city requirement		
26.	**Cabling, connections and Labelling.**			
a.	All cable conductors shall be of ISI marked for quality and safety. It shall be of copper insulated, securely fastened, grouped, wherever possible, using tie warps approximately every 10-20 Cms or cable trays.			
b.	All connections shall be vibration-proof quick release connections except for power cables terminating in terminal blocks, which shall be screwed down.			
c.	All terminal block shall be made from self-extinguishing materials. Terminations shall be logically grouped by function and terminals carrying power shall be segregated from control signal terminals.			

#	Parameter	Minimum Specifications	Bidder Compliance (Yes/No)	Product Documentation Reference
d.	All cables shall be clearly labelled with indelible indication that can clearly be identified by maintenance personnel using “As built : drawings”.			
e.	Lightening arrester shall be installed for safety on each VMD.			
f.	The successful bidder has to provide safety certificate from qualified Electrical engineers approved/certified by Govt. Agency.			
27.	**Local Storage in VMD**	Embedded VMD controller should be capable to store atleast 100 messages and symbols/pictograms to allow display to run in isolated mode on a predefined structures/timings, in case of connectivity failure.		

6.5. Transit Management System

The City Bus Intelligent Transport System shall bring a state of the art system for enhancement and monitoring of operational efficiency and automation to its transit and other allied operations. The system is expected to meet the Authority's objective of enhancing service standards, better planning and efficient operations; bring in commuter centric services, integration of para-transit, and automation of collection and payment of transit fares, revenue generation services like advertisement system. The project also intend to increase security and safety aspect by installing VTU/GPS in the buses and Municipal Vehicles.

The system will deliver the stakeholder requirements by integrating various solutions and technologies onto an integrated platform which will comprise of following distinctive application areas:

S. No.	System	Sub-System
1.	Vehicle Tracking System	A. Vehicle Location System (GPRS/GSM/LoRa basedCommunication) for city buses
		B. Vehicle Location System for Auto Rickshaw
		C. Vehicle Location System for Municipal Vehicles: ▪ SWM Vehicles/ Garbage Collector ▪ AMC Ambulances
2.	Automatic fare Collection System Through ETMs	A. Electronic Ticketing System with Handheld Ticketing Machine scalable to Smart Card reading
3.	Smart Bus Shelters	A. PIS at Bus Shelters/Stops/Depots B. CCTV Camera C. ECB D. Smaller size VMDs

The functional requirements and technical specifications provided in the below sections in this RFP are indicative and carry guiding rule. The MSI is free to offer products and solutions which meet requirements of the RFP focusing on the outcome, future scalability, security, reliability and adherence to specified SLA under this RFP, in line with applicable standards & best practices adopted in the industry. The MSI is encouraged to design an Optimised solution which is technically superior, innovative, proven, better in terms of functionality and is cost effective. Any specified parameters mentioned in the scope/technical requirement in the RFP may be considered if it is required for meeting current & future requirements during the contract period. The MSI is fully responsible for the specified outcome to be achieved.

6.5.1. Functional Requirement

6.5.1.1. Automated Vehicle Location System for City Buses

The Automated Vehicle Location System (AVLS) shall primarily use GPS based location tracking devices mounted on the vehicle as primary source of data for tracking purposes. The location and associated data acquired from the vehicle units shall act as input source for tracking and operations

process management required by user executing their specific functions. The AVLS system shall enable ASCL/AMC/TRTC operations team to monitor vehicle movement in real-time and synthesize the AVL field data to deliver the same on the public information system devices. The AVL data from vehicles other than the transit vehicles shall be delivered to individual process owners within ASCL for further use and processing based on the requirements identified for individual departments.

The AVLS shall be source for enabling public information system service which acts as a source of information to be made available across various types of end point devices like mobile, fixed displays, web etc. in form of text &voice.

The AVLS for city bus shall essentially comprise of following components:

- Bus Mounted GPS based controller with two way communication interface.
- GIS Based Fleet Monitoring and Control System

The central AVLS system should offer functionality to manage diversity of end use requirement as may be required by individual departments for operational use purposes. This should be facilitated by use of common GIS platform and allowing customization of views with respect to asset identification, tracking and process management.

The AVLS system will essentially offer workflows, rules and SOP's being mapped based on the process type and user authorization to carry out functional processes as may be required for specific operations. It may be noted that each department may have specific routing and tracking requirements which may be very specific in case of emergency vehicles and other type of services. The system should offer dispatch and scheduling capability to manage vehicles with reference to end use requirement.

The MSI shall be required to provide facility to ensure that end use requirement of different departments and vehicles is met and functional and technical processes are provided to meet the operational requirements.

The system will also be compliant to GTFS / inter-operable data formats to enable external technology ecosystem provider to build complimentary applications to further boost consumer oriented delivery and service environment.

6.5.1.2. Automated Vehicle Location System for AMC Vehicles

The AVLS for other AMC vehicles shall essentially comprise of following components:

- As mentioned for the Buses above, VLS installed in the AMC vehicles such as SWM Vehicles, AMC Ambulances, Fire Buses, Auto Rickshaws, etc. will also transmit their real time information to the ICCC and to the officials. The VLS system will improve the operations of AMC vehicles as they will be mapped with their KPIs and thus become more accountable. Tracking of Auto Rickshaw and will provide safety aspect to the citizens. The flow of information will be through GPRS/GSM/LoRa based system.

6.5.1.3. Smart Bus Shelters (PIS/ ECB/ VMD/ CCTV Surveillance Camera)

As passengers arrive at the bus station/Stop/Depot/BQS, they need information at different stages before their departure. Smart Bus Shelters equipped with all functionality will provide citizens information about ETA, Safety giving them sence of leisure and comfort. The Smart Bus Shelters will house a GPRS/GSM PIS system, CCTV camera at each Bus Stops, Emergency Call Box/ Panic Buttons, Smaller Size VMDs.

A. PIS system will be as below:

- PIS Display on Bus Stop
- PIS at bus stop will be connected through mobile communication to Central Control Centre GIS module to generate the ETA information for various bus stops
- PIS at Bus Stop should be connected to Integrated Command and Control Centre
- PIS algorithm to be used for ETA/ETD prediction, considering historical data, GPS data, Traffic data and others operating parameters
- Web Portal for Bus Schedule & ETA/Mobile Application

The vendor will develop integrated PIS system for web portal, Android and IOS and other leading mobile OS. The portal will be integrated with Smart City Portal which will be developed as part of future requirement. This Application will have provision for advertisement. To develop Content Management System with ability to remote management of Playlist, Sequence change, Location based ads, prioritization of ads, and dynamic change of Screen layouts.

PIS at Depot cum Terminal and Bus Stops/Shelters

a. LED based Passenger Information Displays (Stops will have 1 number of LED based display terminals).

b. The PIS information will also be made available via website, SMS and mobile apps.

c. These applications will enable commuters to be able to plan their journey well in advance and will also ensure less waiting time at the stations). Each Bus Stops will have one number of LED based display terminals.

d. The vendor shall be responsible for Supply, Installation and Insurance of PIS. All spares required for the smooth operation of the ITS system shall be maintained by the vendor for the entire duration of the contract. Power for PIS displays will be facilitated and provided by the department.

B. CCTV Surveillance Camera

Each Bus Shelters will host a Fixeb Box Camera in it. For Functional Requirement of Surveillance Camera, please refere to section 6.2.1

C. Emergency Call Box

For safety and security of citizen especially women as well as for helping elders/children during any emergency, Smart Bus Shelters will also host an ECB through which citizen can alert the authorities. For Functional/Technical Requirement of ECB, please refere to section 6.2.2.4

D. Variable Message Display

Smart Bus Shelters will also host Smaller Size VMDs, which can be sued for advertisements as well by Government/Authorities to push important/emergency alerts or messages. For Functional/Technical Requirement of ECB, please refere to section 6.4.1

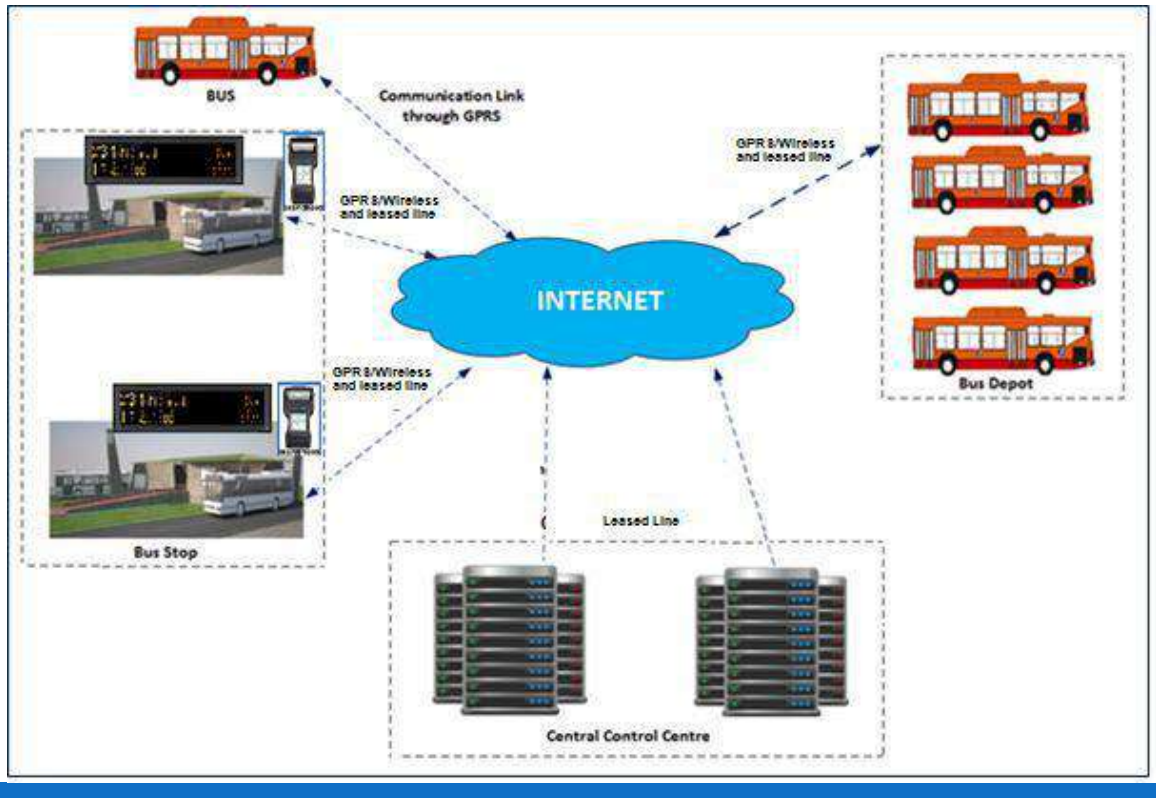
6.5.1.4. Centralized control centre

All the AVLS and PIS equipment will be integrated with the ICCC. This one ICCC will generate the necessary management reports received from the GPS based Vehicle Tracking system and PIS with provision for interoperability with smart cards for future. The Central control center will monitor the movement of vehicles to ensure their adherence to speed limits, routes and punctuality. Central control center will overall monitor and support entire operation like user creation, online support, Incident management (Accident and Breakdown);

The vendor shall develop application module with Dashboard for each of the modules and role based access for the smooth operation of Central control center, and shall deploy support and maintenance manpower at the central/depot control center.

6.5.1.5. Communication Overview

The figure below shows a pictorial representation of the communication network plan for city bus/ other VLS connected vehicle system. The communication system design is a very important part of



the overall system design as the appropriateness of such design will influence the sustainability and operability of the system as a whole. The communication network depicted above takes in account the operations requirement as far as bus/ Other vehicles, bus station, depots, terminal's, data centre, control centre and data recovery site is concerned.

General Packet Radio Service (GPRS)

GPRS is required to be used for services such as Wireless Application Protocol (WAP) access, Short Message Service (SMS), Multimedia Messaging Service (MMS), and for Internet communication services such as email and World Wide Web access.

The information captured by the Integrated Control unit is to be transmitted to the control station server through GPRS/GSM network creating a communication network between Bus, Bus stops along the road, route, and passengers through passenger information system. The communication network is connected to the internet for accessing information regarding bus arrival, routes etc.

6.5.1.6. Overall basic system functional & operational requirement

The bidder will study the complete system including infrastructure, Buses, communications network availability etc. before bidding. The bidder through the study shall get a proper understanding of all aspect of project requirement-which might or might not be detailed in this document or may be added/amended/modified in SRS.

1. Track & Trace Communication System

The Track & Trace system will track & trace the location of vehicle running. The GPS based Vehicle Location System will be used for tracking and tracing the vehicle. The following systems are used for Track & Trace system. Vendor may use [the Authority] existing GIS base-map or Google map for this purpose

2. GPS BASED AVLS & PIS

A	**General Requirement**
1.	GPS based Vehicle Location System will provide the following features:
	a. Ability to locate a bus/ Other Vehicles at a given time in its track to estimate its arrival/departure time at the next destination, based on traffic density, distance, speed, bus occupancy, run-time information from the previous bus arrival time for the same location etc.; b. Ability to send and receive SOS and alerts from moving / stranded buses enroute c. Facility to track defined vs. actual movement of vehicles, capture deviations if any. d. Facility to view vehicle movements real-time on digital maps e. Ability to provide dynamic location specific information as the vehicle approaches bus stop/station for the benefit of passengers

	f. Facility to generate information such as travel time estimation (to be captured in PIS), average time at bus stop, passenger traffic at different location, alerts on exceptions, and logging of the journey details of the bus for each trip g. Facility for citizens to access and view position / location information on GIS maps near real time through web interface with historic data displayed on maps h. Facility for providing current information location on demand i. Provide 2-way voice communication between the driver of the vehicle and the control CCC for receiving SOS and alerts from vehicle j. Facility for playing back the recorded details of the bus movement along the authorized route k. It should enable operational managers to create locations, routes, schedules Vehicle service alerts for service and maintenance l. Vehicle fleet summary dashboard – quick view on vehicle fleet performance m. Register a bus on unscheduled route from backend on real time basis n. Exception recording/ actions (over-speeding, off-route detection, non- stoppage at bus stops, trip cancellation) o. Display of real-time dynamic movement of buses plying on a selected route on map, with real time ETA displayed on stop points plotted on map
2.	The geographical position i.e. Longitude / Latitude coordinates, of each bus stop, Depot and bus station will be identified through a survey by the ITS vendor along with details of tourist centres / points of interest / places of attraction / monuments etc. along the route, precise distances between the bus stops in each route by the ITS vendor
3.	AVL system will provide these data on real time basis at pre-determined and configurable intervals over GPRS/wireless networks and shall support both the time mode (periodic updated based on time interval and distance mode (periodic update based on distance interval)
4.	Transmission of Data on GPRS (primary mode of transmission)
5.	Facility to configure parameters over the air (should be supported over GPRS/SMS). These parameters include APN, Server IP or Fully Qualified Domain Name and port, Data Update frequency. Domain name registration service will be provided by [the Authority]. Firmware upgrade over the air should also be made possible.
6.	Data update rate to server (configurable): Multiple modes to be supported (ACTIVE, NORMAL and STANDBY)
7.	AVL system will support dynamic trip configuration, enabling the crew / control room to activate individual trips, provide route numbers for the UP or DOWN trips.
B	**Operational Requirement**

8.	The web-based system will be capable of data communication with all the system components in real-time.
9.	Uploaded data will not be deleted from device readers or workstations until the central system has provided confirmation acknowledgement that the transactions have been successfully received. All the data should be stored in the central database. 6 months of data to be available active and remaining in archive mode.
10.	The web-based system will able to update its date and time using time synchronization application of servers. Also the date and time on all system devices and workstations should also be updated.
11.	The ITS vendor will manage all device activity including data storage and processing.
12.	All active equipment will have an internally maintained date and time clock that is synchronized using a time interval via the communications medium with the system date and time clock.
13.	The systems will be driven by configurable parameters and should provide the flexibility for maximum configuration. The configurations will be for, but not limited to: ▪ Time based messages/reports ▪ User groups and users privileges ▪ Addition & deletion of equipment's, nodes, stations, user groups, users ▪ Configurable messages in minimum English and Hindi and Bangla Languages ▪ Reports access
14.	The system will handle all degraded conditions which can be, but not limited to the following: ▪ Any supplied equipment not functional ▪ Power failures ▪ Data connection lost ▪ Central server down ▪ Bus-station switch non-functional
C	**Software location playback**
15.	The vendor will provide all software and hardware that comprise the overall central system, including the required number of licenses for all users.
16.	The software will provide controls to view the entire sequence of reported locations from the beginning of the time period or to step through the sequence incrementally forwards or backwards.
17.	The software will be accessed on workstations and control centers of all user identified by [the Authority]. All communications and AVL data will be stored in a manner that

	allows direct access by the software for at least 120 days and reporting data for 18 months live in the system. ITS vendor will provide Utilities to support archive and restore functions for older data.
18.	The system will allow replay for a single vehicle, selected set of vehicles or all vehicles or cluster wise vehicle or route wise vehicle on the selected map view for selected time period.
19.	The system will allow selection of any time period for the historical data. All data will be the property of [the Authority] and will be immediately available to [the Authority].
20.	The replay data will include location and headway adherence data.
21.	All users accessing the AVL software will be able to access the playback function.
22.	The system will allow the ability to use playback without exiting from the current AVL operational view.
23.	The system will be able to store a playback in a format that can be exported for viewing on any computer.
24.	All servers will be fully redundant and capable of automatic failover without administrator intervention.
D	**Graphical Interface**
25.	The central system shall be delivered with a fully functioning Graphical User Interface (GUI)
26.	The Graphical User Interface shall be based on standard web based browser controls or an equivalent system.
27.	The system will only be accessible by authorized persons, controlled using login and password protection. The login and password will be a single system for entire ITS modules. Role based access and SSO (Single Sign On)
28.	It will be possible to create different user classes/categories/roles with different access level.
29.	The system will maintain a transaction log that records all users that access system reports. The pages/reports accessed, edits and changes to the database and the system logon and logoff times. The transaction log will maintain this information for a minimum of one year. Minimum Concurrent User should be 2000
30.	The system security will provide features to maintain data integrity, including error checking, error monitoring, error handling and encryption.
31.	Features will be provided to ensure that all system-created files are uniquely identified, and that no files are lost or missed during data transfer.
32.	System will have verification features to confirm that there have been no losses of data at any point in the transfers.

33.	System needs to be tamper proof and ITS vendor would build features to confirm that there have been no unauthorized changes to, or destruction of, data.
34.	Features will be provided to automatically detect, correct and prevent the propagation of invalid or erroneous data throughout the system.
35.	All systems, sub-systems and devices will only allow access to authorized user classes.
36.	All security breach detections will be confidential, and accessible only to users of the appropriate class.
37.	For all data transactions, the system security will include authentication features to verify that all claimed source, recipient or user identities are correct and valid. All data transactions will include non-repudiation features to verify message content, and resolve claims that data was not correctly originated or received by a certain user.
E.	**Maintenance Mode-Operational Requirement**
38.	The web-based system and all the equipment (on-board equipment, PIS displays in stations etc.) will all support a maintenance mode during repair, replacement and testing of equipment.
39.	All the functions that are carried out in the maintenance mode will be reported separately similar to exception transactions
40.	The maintenance mode will be possible to be activated based on a particular node wise.
41.	The maintenance mode can be activated only by a person having the highest user privilege in terms of system operations.
42.	Logins and logouts will be transmitted to the system, along with associated Date/Time, employee ID, equipment ID etc.
43.	It will be possible to upgrade the firmware/ software from the central server using the internet communication available at the station level.
F.	**Scalability/Future Operational Requirement**
44.	The central software will be scalable to accommodate for buses, bus-station/BQS/terminal PIS, without any modifications to the central software except minor configuration changes, the details of how scalable the system is will be provided in the proposal by the ITS vendor at the time of SRS. The minimum scalability will be for 2000Buses, 2000 PIS for BQS and Bus terminal, 50 bus depots and 30 UPTS. Authority will not pay any excess fees for increase in volume up to scalability.
45.	The software will provide standard reports based on the AVL data. ITS vendor will provide details in their proposal related to reports that are offered and the degree to which they can be configured (at minimum all report will be configurable for a specified date/time range and route). Some of the expected standard reports are as follows: a Headway adherence b Active fleet (weekday and weekend) c Service hours and mileage

	d Schedule Adherence e Speed Reports f Route Deviation reports
46.	The ITS vendor will facilitate the UCC to generate all the reports necessary to facilitate the payments to the bus operations team/contractor.
47.	The software will have the capability to generate reports based on exceptions as per thresholds set by the Authority/UPTS staff for various AVL components.
48.	The ITS vendor will provide tools to generate ad-hoc reports on stored AVL data.
49.	All reports will use standard reporting tools (e.g., RDBMS or SQL or Crystal Reports etc.) and will have the ability to export data into file formats that can be exported to and edited with standard tool i.e. excel, etc. The ITS vendor shall provide the relational database layout including related fields, key fields and definitions for all fields in all tables in the database.
50.	Any portion of the transactional database will be exportable in standard formats (such as comma separated variable (.CSV, xls, xlsx files etc.) for analysis in third party programs.
51.	It will be possible for users to build custom reports from the data in the transactional database with tools such as RDBMS or SQL. The reports will be capable to be exported to pdf, xls, xlsx formats easily.
52.	A data dictionary will be provided to Authority to facilitate development of custom reports.
53.	The Central System will provide sufficient summarized and detailed data including features to generate standard report based on pre-established criteria, as well as as-required reports based on a user-definable set of search criteria.
54.	All reports will be generated using a query language and standard query engine that provides flexibility for future updates, and for creation of new reports.
55.	Reporting software will include the ability to generate graphs and charts based on criteria and format defined by the user.
56.	All reports will be generated with configurable time parameters, including as a minimum annual, monthly, weekly, daily, hourly and with user defined start-end date and time ranges.
57.	The SI will provide an reporting function and interface into the data and reports server to allow Authority personnel to create, execute and receive custom reports without Authority assistance with integration with fare collection system. An Internet-based interface will be provided for this function, accessible by Authority personnel with appropriate permissions. Authority users will be able to generate ad-hoc reports and do additional analysis of ridership, revenue and other System data. The SI will provide Authority's staff to generate reports and use the system. Examples of the types of reports include: • Transaction-level reports by stop and for user-defined start and end points;

	• Statistical and research reports using user-defined criteria
58.	It will be possible to aggregate data (filter) for reporting, at a minimum, by: • Date/Time • Origin • Destination • Location • Equipment Serial Number It will not be necessary that values be consecutive for the purposes of aggregation (e.g. non-consecutive months).
59.	The actual bus operational business rules will keep varying and Authority/UPTS will share the same with the SI from time to time and the vendor has to reflect it in the ITS application for generation of any additional reports etc. The cost of which will be deemed to be included in the monthly annuity cost.
G	**Web Portal and Map (For Future Purpose)**
60.	The ITS vendor shall develop a Modular CMS based website. The user will be able to enter in the route, direction, station/stop ID or select these from a sequence of drill down lists and from a map.
61.	The ITS vendor will be responsible for the design and development of the website, including all required HTML, scripting, and integration with the AVL system. The ITS vendor will be responsible for the integration and setup of the website. The website GUI will allow for the graphical presentation of vehicle locations on GIS-based maps.
62.	The AVL software will incorporate maps to support the functionality, comprised of a selection of individually selectable theme layers (e.g., stations, streets, names, water features, parks, major buildings etc.). ITS vendor may use [the Authority] existing GIS base-map or Google map for this purpose
63.	The ITS vendor will provide a GIS based base map for the purpose of the project at appropriate scale which would be acceptable to [the Authority] operationally
64.	The system will include mechanisms to allow for 6 monthly updates by [the Authority] to the central software maps during the contract period
65.	Develop additional overlay map layers to the external source map that can include polygons (e.g., municipal boundaries, fare zones), lines (e.g., route traces) and points (e.g., landmarks, transfer locations, time-points, stops), with the color, shape and thickness being selectable.
66.	The software will allow users to view the map, including a selectable combination of the source map layers and new layers, at various user-defined zoom levels.
67.	The map display icon for each vehicle location to display as the label the vehicle, block or route.

68.	The display icon of the bus on the map will provide an indication if the latest reported location being displayed is older than the reporting interval or not, to identify packet losses and delay in communication transfer.
69.	The system will track headways at corridor stations for each individual route serving the station, all routes serving the station, and for any user-specified combination of routes serving the station.
70.	The system will highlight to the operator the vehicle IDs of those vehicles that are operating with incorrect headway, using tabular and map displays to indicate their current headway adherence status.
71.	The system will provide a real-time output of the current location and schedule adherence for all fleet vehicles, for use by the next stop prediction software. The ITS vendor will document and provide to [the Authority] the communications protocols, command sets and message formats used in this interface.
H	**Real Time PIS Requirement: Prediction Software**
72.	The system will use the real time location and schedule adherence data to create a continuously updated table and XML data feed of the last reported location for all vehicles and the next arrival predictions for all stations/stops.
73.	The system will provide this data table and XML data feed such that Authority and designated third parties have the right to perpetual and royalty-free access, for the purposes for integration with future Passenger Information System (PIS) or other public information methods and importing data into the long term database.
74.	The ITS vendor will also provide a data dictionary and entity relationship diagram for the data tables and XML schema documentation. The information required by the algorithm(s) will be manually entered into a prediction support database.
75.	The system will allow the user to configure the prediction support database values.
76.	The percent error for next vehicle arrival time predictions at a given station/stop for a given minute in advance of arrival will be calculated as: absolute value of (predicted time to next arrival minus observed time to next arrival) divided by (observed time to next arrival). For example, if the observed time to next arrival was 7 minutes relative to a predicted time to next arrival of 8 minutes, the percent error would be 1/7 (i.e., 14%).
77.	The LED half-life (time until light output has diminished by 50% from the original rated value) will be a minimum of 100,000 hours
78.	Real time duplex communication to the PIS will be through the GPRS connection to the sign.

79.	The PIS will be able to display a message composed of any combination of alphanumeric character fonts and punctuation symbols. PIS will also allow Telugu and English fonts to be displayed simultaneously.
I	**Documentation**
80.	The documents to be developed include: a. Site and System Survey document that shall provide the understanding of the Bidder b. Hardware Design document that shall provide the solution of the bidder c. Software Design document that shall provide the details of the software, including the AVL Application Software as per requirements of Authority. d. System Requirement Specification (SRS) that will detail out the ITS vendor system design development, integration understanding and how they map with the requirements. e. Installation diagrams for all supplied equipment.
81.	The vendor shall develop detailed test plans that cover the requirements. Test Plans shall be developed for all components of the project, including and would need to be approved by Authority: a. Bus Control Unit (BCU) FAT b. PIS Display Board FAT c. ALL Application Testing d. Software Testing e. Hardware Testing f. System Acceptance Testing g. Operations Acceptance Testing

6.5.1.7. Electronic Ticketing Machine

Electronic Ticketing System (ETS) would lead to collection of fares either through spot printed (ETM Issued) tickets via Electronic Ticketing Machine (ETM) or sale of manual tickets in-case of failure of ETM machines, and Smart Card Operations. ETS will consist of handheld ETMs used by conductors to automate Fare Collection by issuing spot-ETM printed tickets. Contactless Smart cards for travel (with e-purse for passes and tickets) will be procured in the near future for which the vendor (implementing the ITS project) will provide support and coordinate to ensure smooth functioning and validation of smart cards through the ETMs (as and when the smart cards are procured). As ETMs will validate e-purse smart cards in future, a provision must be made in the ETMs for a smart card reader with inbuilt security protocols and modules to integrate fare with other modes such as Metro etc. The ETS will support secure transfer of financial data from ETM through GSM network to a central server at preconfigured intervals. Detailed ETS features is explained as follows:

1. The Electronic Ticketing Machine should facilitate the following tasks:

a. Bar Coded paper ticket sales
b. Bar Coded paper ticket adjustment
c. Smart Card Validation

d. Smart Card Balance Check

2. The ETM's shall be connected to the central system though mobile connection and the Bidder shall bear all cost for such connection during the entire contract period
3. The ticket data should be communicated online from ETM devices to backend over GPRS/USSD using encrypted protocols and should automate revenue reconciliation data
4. The handheld machine shall consist of but not limited to smart card reader, bar-coded ticket printer, integrated communication modem, user interface (e.g. touch screen or screen with keypad), on board data storage, and battery power supply.
5. The user interface shall allow an experienced conductor to issue a ticket in less than four (4) seconds.
6. The handheld machine shall allow TRTC to transmit data to the central system in real-time using the integrated modem.

7. User Interface

a. The handheld machine shall have an integrated display that can be easily read under all conditions of ambient light throughout the day and night.

b. It shall be possible to upgrade the firmware/software from the central server, configuration list such as routes along with fare and other related details etc., data from and to the CCC Over–The- Air (OTA) using the wireless technology.

c. If for any reason the fare media cannot be read automatically using the readers on the handheld, there shall be an arrangement to manually enter the smart card ID and validate it.

8. On-Board Storage

a. The handheld machine shall store all required transaction data on-board, including:

- Date and time of transaction
- Device ID
- Employee ID of conductor
- Fare-tables
- Ticket serial number
- Ticket origin
- Ticket destination
- Transaction Value
- Action taken (e.g. ticket sold/adjusted/checked)
- Smart card serial number (if applicable)
- Transmission Status (i.e. successfully transmitted/not successfully transmitted)

b. The handheld machine shall have sufficient memory to store a minimum of one-week worth of transaction records apart from mandatory software/ firmware etc.

c. Only successfully transmitted transaction data records shall be overwritten by new transaction data records

d. The handheld machine shall provide a warning when the amount of on-board storage occupied by "not successfully transmitted" transaction data records exceeds TSRTC specified threshold

e. The handheld machine shall store the current valid fare-set as well as a future "pending" fare set with activation date and time (if applicable), to allow downloads to the handheld machine to occur in advance

f. When the activation date and time passes, the revaluing unit shall automatically replace the existing fare table with the "pending" fare table

9. User Login

a. Initiate handheld machine operation, a conductor shall manually enter an employee ID and a PIN, or a proximity standard

b. Logins and logouts shall be transmitted to the central system, along with associated Date/ Time and employee ID

c. The handheld machine shall be used by mobile ticket conductors to sell tickets to customers

d. The tickets issued shall comply with all requirements laid out in the relevant sections

e. The conductor shall be able to manually adjust the current origin location

f. The origin shall be set only once whenever it is changed so that the conductor needs to enter only the destination of people until the next origin is reached

g. To sell a ticket using the handheld machine the conductor shall, upon receiving payment, enter the destination using the interface (using the current origin which is periodically adjusted manually by the conductor)

h. The handheld machine shall then print the ticket for issuance to the passenger

i. The system shall provide the ability to add a configurable fine (either optional or mandatory for use by the conductor) to a ticket by pressing the appropriate buttons on the handheld machine interface (for example, if a new ticket must be issued because a customer does not have a ticket or has an expired ticket)

10. Smart Card Usage on the ETM

a. The handheld machine shall have a trip validation functionality whereby when a smart card is tapped to the reader, the ticket origin and date/time of the tap-in is displayed on the handheld device display.

b. Upon successful completion of the transaction the handheld machine shall transmit transaction data to the central system, including:

- Date and Time of Transaction
- Device Identification Number
- Ticket Serial Number
- Ticket Origin
- Ticket Destination
- Smart Card Serial Number
- Upon successful completion of the transaction the handheld machine shall indicate successful completion via the interface, using both the display and a distinct configurable audio message.

6.5.2. Technical Specifications

6.5.2.1. GPS based Automated Vehicle Location System/ Vehicle Tracking Control Units

VTCU device can be installed in the City buses, AMC Vehicles and other vehicles such as Auto Rickshaw, identified for this purpose. Below mentioned are the minimum hardware specifications of the VTCU.

A	GPS Based Vehicle Tracking Unit (IN Built In All UBSII buses)
1.	The GPS based VTU are to be installed in the buses and other AMC vehicles (ambulances) along with Auto Rickshaw
2.	GPS Based VTU will update the location information like Latitude and Longitude to the central server through GPRS.
3.	The tracking system / GPS Based VTU fitted in the buses will calculate the positions from the GPS receiver and transfer the data to the Control Centre Server through GPRS interface for processing /prediction of arrival time of buses at different bus stops. The GPRS tracking unit fitted in the bus will also transfer the current LONG/LAT data to the bus mounted display for display /audio announcement of Bus Stops. 1. VTU should capture a minimum of GPS (Location, speed, heading or direction, timestamp) 2. Data sending frequency of less than or equal to 10 sec or configurable 3. Capability to send Network measurement report (NMR) 4. VTU memory to store minimum of 24 hours (One Calendar Day) of movement data and until it is transmitted to the server for that day 5. The Tracking Unit should have position accuracy of 5 -10 m or better. 6. Should provide the Data communication protocol, listener API and associated software and database applications so that the VTU data can be received at central server and data outputs as per NMEA 0183 format. 7. Remote Configuration, activation, status alert, deactivation of device and alert for disconnection of main power from VTU by SMS must be available. 8. Tamper Proof, Vandal Proof and Water Proof enclosure (IP65 and above) for GPS, internal antenna and power supply must be provided with metallic casing for the unit, metallic tube covering the power supply 9. The device should operate on 9V-35V vehicle battery. The unit should also have an internal back-up battery (8 hours) and the battery charge should be indicated in the unit. 10. Five year warranty for the equipment's 11. Hot Start < 5s 12. Warm Start < 40s 13. Cold Start < 60s 14. Temperature range: As per the city requirement 15. Humidity Level: 5% to 95% non-condensing 16. Operating temperature: 0-60*c

	17. Sensitivity: (-) 158 dB **Ports:** 1) I/Os: A provision to be made for Inputs and Outputs relays, sirens etc. 2) Ignition sensing 3) RS232 ports (2 ports) 4) USB ports (2 ports) **Power Specifications** 1) Input voltage range 9V - 35 V 2) Active mode Peak <= 1.0 A 3) Active mode Avg <= 200mA/; Intelligent power management system 4) 8 hours or more of Battery Back Up 5) Sleep Mode <= 25 mA
4.	The GPS Based system with wireless communication module (based on GPRS) shall be used to provide vehicle tracking accurately and reliably. The following are minimum list of features required: a. GPS based VTCU will consist of a GPS receiver with inbuilt GPS Antenna, GSM/ GPRS receiver, etc. to enable services such as vehicle tracking, communication and control in connection with a backend control centre system. b. The device is pre-installed on each City Bus fleet vehicle and integrated with all the other in-vehicle ITS functions and hardware being installed (as and when in future) (e.g., Automated Stop Announcement Variable Message Signs and Public Address amplifier with speakers, Cellular Data Modem, Transit Signal Priority Emitters, Bus Door Sensors), and will support the data transfer to/from the central system through a commercial cellular data network. c. GPS Based VTCU will be mounted inside the vehicle and shall be vibration & shock resistant, heat resistant, dust resistant and water / rain splash resistant and shall be tamper proof. It should as per to relevant Indian or International standards. d. The device will be operated from vehicle battery connection but will preserve battery life by tying its operation and that of the other on board equipment being installed under this contract to the bus ignition switch. Electrical Characteristics. Primary Power: Vehicle Battery 12/24 volts. Battery Life: Mandatory 8 Hours normal operation. e. GPS Based VTCU software will be upgradeable/ configurable. ITS vendor support team will help in such firmware upgrade. f. The VTCU within the bus shall be easily accessible for servicing to specified vendor but located to prevent tampering or unauthorized removal. ITS vendor must inform Authority/UPTS for such unlawful activity.

SMS Management for Vehicle Tracking & PIS System:

The system shall cater to the following.

a) Arranging with a SMS service provider for providing the SMS service with a standard number.

b) System shall automatically reply (send SMS) to all SMS enquiries.

c) The rate at which the SMS shall be charged to the end user is to be indicated and should comply with the guidelines from telecom authorities.

d) Provide reports regarding number of SMS's received (category wise) and sent (category wise), cost of the SMS's and revenue generated for this service.

e) The system shall have provision to send SMS to concerned mobile numbers (TRTC Officials) by TRTC users, on selected criteria, with customized message.

f) The revenue generated by this service shall accrue to TRTC and the commercial arrangement proposed for handling SMS shall be clearly provided by the bidder.

6.5.2.1.1 AVLS Software

The software shall be web based and utilizes high resolution digital map to show real-time position of the vehicles. The software shall provide map based tracking and transit route line based tracking of vehicles by the control centre operators. The software is expected to have enterprise capabilities which enables multiple user type to be enabled to carry out various functions like, Alarm Management, Vehicle Schedule Tracking, Speed Management, Stoppage management, Route replays, bus tracking dashboard etc. as a standard functionality. The software shall enable control centre management staff quick decision making capability, which shall be achieved by providing graphical tools for visualization. The software shall enable ASCL/TRTC to drill and analyze information and online data in a multi-dimensional manner. Comprehensive analysis and reporting capabilities are expected to be part of the application delivery which matches the world standard capabilities of AVLS systems.

The software should have capability to have a multi-screen based tracking system, so as to enable tracking staff to quickly analyze activities and have a better insight into operational data of all activities within the system.

6.5.2.1.2 AVLS Controller Software Functionalities

1. Ability to distribute control of services among controllers
2. Real Time Communication with the Fleet
3. Supervision and Monitoring Of Fleet Positions in Real-Time
4. Ability to Track Bus Service based on different operational state parameters
5. Time Monitoring Analysis
6. On-Line Assignment of Service Time
7. Management of Information Displays at Stops
8. Regulating Service by Time and Frequency
9. Ability to See Trips by different colours

10. Colour Legend of Vehicles
11. Status Tracking of Messages Sent to BDC
12. Status Tracking of Messages Sent to Internal Screens
13. Controller System Messages
14. Controller's Authentication
15. Vehicles, Virtual Vehicles, Stops and Lines on Map
16. Vehicles, Virtual Vehicles, Stops and Lines on Straight-Line Diagram
17. Information on Vehicle on mouse overs
18. Information on PIS and Stops on Mouse Over
19. Vehicle Menu
20. Information on Drivers
21. Detailed Control information of Vehicle
22. Selection of Stop on Route
23. Ability to Define Types of Stops
24. Detailed Stop Control
25. Detailed Stop Control
26. Current Trip Views on Map, Lines etc.
27. Multi-Map Views
28. Ability for Zone Creation
29. Ability to Draw Detours on Map in Send it to Vehicles in Real-Time
30. Management of Detours
31. General Control of Lines
32. Control of Routes
33. Technical Alarms Management and Disposal
34. Bus Alerts management and Disposal
35. Messages to Console, Manually, Auto Mode, Event Activated
36. Automatic Messages with Acknowledgment
37. Messages to PIS Screens
38. Answering Messages from the Vehicle
39. Panic Button Messages Management
40. Information Panel Messages
41. Line Legend
42. Lines with Activated Legend
43. Bus Service Graph
44. Trip Graph
45. Information Signs – Checking On the Lines
46. Information Signs – Checking On Predefined Messages
47. Information Signs – Checking On On-Line Messages
48. Information Displays – Lines
49. Information Displays – Predefined Messages

50. Information Signs – On-Line Messages
51. Information Signs – Simulator
52. Statistics of Lines, Drivers, Routes etc.
53. Traffic Density using Colour Codes on Lines, Maps

6.5.2.1.3 GPS Device Configuration & Management

1. Configuration of driver's interface (console) messages
2. Configuration of predefined messages
3. Configuration of zone messages
4. Filtering lines for warning the controller
5. Calendar configuration
6. Configuration of voice types and frequency
7. Map data configuration
8. Incident types
9. Controller Authentication
10. Configuration of Vehicle Control Panel Messages
11. Configuration of Predefined Messages
12. Creation of Predefined Messages
13. Zone Indication Message to Buses
14. I/O Zone Warning Messages
15. Line Filter for which Warnings are sent to the Controller
16. Day Type Configuration, New Day
17. Day Type Configuration, Alter
18. Day Type Configuration, Search
19. Day Type Configuration, Seasons
20. Day Type Configuration, Results
21. Voice Time Configuration
22. Configuration of Reaction Times
23. Map Data

6.5.2.1.4 Maintenance Requirements

1. Device settings shall be updated including software/firmware updates through transmission via the secured communication network set up by the service provider. For reasons of security, device settings shall not be modifiable by field staff of the service provider/others.

2. Any device settings modifications including software/firmware updates as well as business rules such as fare settings, discounts etc. shall be done with prior authorization by ASCL/TRTC. A digital log of all changes of settings on each and every device shall be maintained and delivered to ASCL/TRTC.

3. Any faulty equipment shall be replaced with a tested unit from the spares maintained by service provider.

4. Repair and testing of equipment shall be done at the Service provider's maintenance centre and not at site.
5. Only a maintenance engineer with maintenance access card shall be able to access maintenance mode of the device which shall allow the maintenance engineer to diagnose the faults and update the device settings directly, if required.
6. A repaired unit shall be tested for full functionality as at the time of initial deployment and certified before it is reinstalled at any site.

6.5.2.2. Smart Bus Shelters

Smart Bus Shelters will host (but not limited to) Passenger Information System, CCTV camera, ECB, VMDs etc. The hardwares shall consist of LED based display system for bus shelters, Terminals and Buses, Fixed Box Camera, VMDs etc. Following are the technical specifications for these units.

6.5.2.2.1 PIS at Bus Shelters and terminals

The passenger information system shall comprise of following components:

a. Display Screen on Bus Shelters
b. Display Screen on Bus
c. Voice announcement system on Bus
d. Web Portal for Bus route Schedule & ETA
e. Mobile Schedule Access System

LED based display screens that provide sufficient visibility in broad daylight condition shall be installed at Bus Shelters & Terminals. There shall be two displays per shelter. They shall display route and estimated arrival time (ETA) including digital advertisements and other digital content as may be approved by ASCL/TRTC. They may also be used to display public service information.

The display shall receive encoded information of route and ETA from the AVLS control syetm through the common wired/wireless communication link set up at each bus shelter. The displays must have the ability to decode the information received from ICCC and display appropriate message on the screen. LED Board at Bus Shelters & Terminals shall have the following functional specifications:

a. Display of PIS in a display unit at bus shelter shall be configurable based on bus shelter and platform. Single unit should display services of more than one platform.
b. Information Display units will be supplied and mounted appropriately, configured and commissioned by the MSI.
c. PIS information shall be displayed in Hindi, English and Bengali alternatively (single or multiple language shall be configurable).
d. At all these bus shelters, display units will receive/display transmitted contents from the central system through a gateway or mention other suitable means in the technical architecture.

e. Display systems needs to support full colour display for streaming advertisements, Digital display of text, images and video on LED screens.
f. Displayed messages must be readable in high bright, day light.
g. Display system in addition to the display of information for PIS shall be capable of displaying advertisements and multimedia content at the bus shelters and may need to alternate between Passenger information and Advertisements.
h. The frequency and period of information display on PIS display shall be configurable from central location for advertisements and other transit information.
i. Display shall provide for modular configurable layout enabling parallel display of content on different areas of the screen – Real time Transit information (Routes, ETA, Type of service, Fare, Time/Date, Public announcements, Safety information, Commercial advertising, a ticker tape at the bottom for text announcements/advertisements, other local Tourist information).
j. All displays for PIS will have a configurable refresh rate with minimum of 10 seconds.

6.5.2.2.2 Display System Technical Requirement (PIS)

a. Display units shall be mounted on a rugged enclosure to withstand harsh environmental conditions with reasonable physical security.
b. Display will be located at a convenient height to have a clear view of the message of next arrival bus.
c. Fitment provision will have to be provided in the Bus stations. The power supply shall be made available by ASCL/TRTC.
d. One Integrated tamper proof casing for complete PIS Unit addressing physical security considerations.
e. Provide any hardware like PC, networking, etc. required to run the PIS and advertisements on LED Display Units.
f. Ensure smooth transition from main power supply to UPS in case of power outage.
g. Aesthetic requirements such as fonts, colours, rows per page, display time to be remotely configurable and displayed based on business requirement.

6.5.2.2.3 Web Portal for Bus Schedule & ETA (for future application)

ASCL/TRTC's transit web portal shall extend capabilities to passengers to download route information, route schedule and real-time ETA from the web portal. This information must be accessible using WAP enabled mobile phones also. The portal shall have facilities for pass application, card top-up using credit/debit cards. Etc.

The MSI shall also be required to develop mobile App for iOS, Android, Windows mobile devices to enable commuter to use the same for the purpose of travel information relating to service which may include, route planning, ETA, Offers, Fare and route tables etc.

The portal will act as a single source of information with regards to transportation system in Agartala city and hence shall have all possible interfaces like logging complaints, viewing transport information, real-time updates, organizational structure, citizen blogs etc.

The portal shall have sections which shall provide information related to travel advisories, camera still feeds and PIS locations mapped on GIS map with real-time data.

6.5.2.2.4 PIS LED Display for Bus Shelters/Stops (2 Rows)

#	Parameters	Minimum Specifications	Bidder Compliance (Yes/No)	Product Documentation Reference
1.	**Make**		<to be provided by the bidder>	
2.	**Model**		<to be provided by the bidder>	
3.	Display Size	Two horizontal LED panels, joined horizontally Size of each display : As per following 1 — 900 mm x 200 mm 2 — 900 mm x 200 mm		
4.	Type of LED	Diffused lens 4 mm (minimum) or SMD PLCC- 2 LED		
5.	Pitch	Maximum: H 10.5mmx V 14.1mm		
6.	Colour	Amber colored LED		
7.	Wavelength	Wave length 591~595nm		
8.	Viewing distance	30 meters, for single line text, in day and night		
9.	Viewing Angle	120°H / 60°V		
10.	Readability	Ensure readability with full clarity (no jitter) on scrolls and long life usage		
11.	Light Sensor	In-built light sensor with continuously variable brightness control to enable the display intensity to change based on ambient light conditions		
12.	Graphics	Alphanumeric text with customized graphic capability		
13.	Language	English, Hindi		
14.	Messages	Fixed, scrolling and flashing mode Display of Stop Name, ETA of bus with bus route number Display public service information / adhoc messages Current date and time		
15.	Memory	Ability to retain the last message displayed in the memory of the sign even in		

#	Parameters	Minimum Specifications	Bidder Compliance (Yes/No)	Product Documentation Reference
		the event of power failure and without the message being reloaded.		
16.	Cabinet Design	Light weight structure with toughened glass at the front side Antitheft and anti-vandalism proof		
17.	IP Protection	IP 65		
18.	Protection	The Display unit to be mounted inside an anti-theft and anti-vandalism proof Enclosure		
19.	EMI/EMC	Test complied as per – AIS004 Part 3		
20.	Temperature	As per Agartala weather conditions		
21.	Humidity	As per Agartala weather conditions		
22.	Usage	24x7x365		
23.	Communication	Through GPRS (SIM based) or Local LAN port (to be connected to switch) or any better technology		
24.	Power	AC Power (100-240V AC)		
25.	Protection	Over voltage, Reverse Polarity, ESD, Communication lines protection		

6.5.2.2.5 PIS LED Multi Line Display for Bus Terminals/Depot

#	Parameters	Minimum Specifications	Bidder Compliance (Yes/No)	Product Documentation Reference
1.	**Make**		<to be provided by the bidder>	
2.	**Model**		<to be provided by the bidder>	
3.	Display Size	Six horizontal LED panels, joined horizontally Size of each display : As per following 1 – 900 mm x 100 mm 2 – 900 mm x 100 mm 3 – 900 mm x 100 mm 4 – 900 mm x 100 mm 5 – 900 mm x 100 mm		

#	Parameters	Minimum Specifications	Bidder Compliance (Yes/No)	Product Documentation Reference
		6 900 mm x 100 mm Overall cabinet 1000 mm x 700 mm (approx.)		
4.	Type of LED	Diffused lens 4 mm (minimum)/SMD PLCC		
5.	Pitch	6.25 x 6.25		
6.	Colour	Amber colored LED		
7.	Wavelength	Wave length 591~595nm		
8.	Viewing distance	30 meters, for single line text, in day and night		
9.	Viewing Angle	120 degree Horizontal/60 Degree Vertical		
10	Readability	Ensure readability with full clarity (no jitter) on scrolls and long life Usage		
11	Light Sensor	In-built light sensor with continuously variable brightness control to enable the display intensity to change based on ambient light conditions		
12	Graphics	Alphanumeric text with customized graphic capability, 50 mm minimum for English Characters		
13	Language	English, Hindi		
14	Messages	Fixed, scrolling and flashing mode Display of Stop Name, ETA of bus with bus route number Display public service information / adhoc messages Current date and time		
15	Memory	Ability to retain the last messages displayed in the memory of the sign even in the event of power failure and without the message being reloaded. (minimum 8 GB memory)		
16	Cabinet Design	Light weight structure with toughened glass at the front		

#	Parameters	Minimum Specifications	Bidder Compliance (Yes/No)	Product Documentation Reference
		side Antitheft and anti-vandalism proof		
17	IP Protection	IP 65		
18	Protection	The Display unit to be mounted inside an anti-theft and anti-vandalism proof Enclosure		
19	Temperature	As per Agartala weather conditions		
20	Humidity	As per Agartala weather conditions		
21	Usage	24x7x365		
22	Communication	Through GPRS (SIM based) or Local LAN port (to be connected to switch) or any better technology		
23	Power	AC Power (100-240V AC)		
24	Protection	Over voltage, Reverse Polarity, ESD, Communication lines protection		

6.5.2.2.6 CCTV Surveillance Camera

Each Bus Shelters will host a Fixeb Box Camera in it.

#	Minimum Specifications
1.	For specification on Fixeb Box Camera, refer to section 6.2.2.2

6.5.2.2.7 Emergency Call Box

For safety and security of citizen especially women as well as for helping elders/children during any emergency, Smart Bus Shelters will also host an ECB through which citizen can alert the authorities.

#	Minimum Specifications
1.	For Specification of ECB, please refere to section 6.2.2.4

6.5.2.2.8 Variable Message Display

Smart Bus Shelters will also host Smaller Size VMDs, which can be sued for advertisements as well by Government/Authorities to push important/emergency alerts or messages.

#	Minimum Specifications
1.	For Functional/Technical Requirement of ECB, please refere to section 6.4.2

6.5.2.3. Incident Management System

Incident management is the process of managing multi-agency, multi-jurisdictional responses to disruptions. Efficient and coordinated management of incidents reduces their adverse impacts on public safety, traffic conditions, and the local economy.Incident management yields significant benefits through reduced vehicle delays and enhanced safety to motorists through the reduction of incident frequency and improved response and clearance times.

Incident management is a planned effort to use all resources available to reduce the impact of incidents and improve the safety of all involved.

6.5.2.3.1 Emergency/incident management

Emergency/incident Management shall be handled through the AVLS. In general, the strategies for emergency/incident management will be developed at a broader organizational level, and shall involve many stakeholders including the AVLS system.

Emergency/incidents can be clustered in three levels, which have differing levels of response:

- Individual vehicle or location
- Impacting only the public transport services
- Impacting the urban area and utilities, of which public transport is one

Emergency/incidents cover the following scenarios:

- Breakdown of vehicle or collision, requiring technical assistance or replacement
- Collision, illness or other non-criminal incident requiring medical support
- Assault, aggressive or security incident, requiring police/security response
- Pre-advised diversion or restriction due to road construction/repairs or other cause
- Unplanned diversion or restriction
- Weather-related events and restrictions
- Events, requiring diversions and/or additional services

For the most part, when such incidents occur, the Operations Management is achieved through the AVLS system, and the Route Condition Monitoring and Schedule Adherence applications. SOP's shall govern the management of various incident types, and activated as required.

Specific Transit Management System supports for emergency/incident management include:

- Alarm/alert initiated by the driver. This can override the normal communication protocols and get priority alert to the dispatcher.
- For known disruptions (e.g. planned road work, events) temporary route diversions, temporary schedules and adjusted sectional running times can be pre-programmed into the AVLS system and activated for the period of the works
- For occasional disruptions (e.g. key street unavailable), alternative plans can be stored within the AVLS system, and activated whenever a trigger event occurs (e.g. weather alert, demonstration).
- Data exchange among the transportation and security agencies
- Traffic signal adjustment in the vicinity of the disruption areas

The incident management process shall include:

- Detection
- Verification
- Motorist Information
- Response
- Site Management
- Traffic Management
- Clearance

This system would ideally execute following phases:

- Notification phase
- Response phase
- Recovery phase
- Restoration phase

6.5.2.4. Mobile NVR for City Buses

#	Minimum Specifications	Bidder Compliance (Yes/No)	Product Documentation Reference
1.	**Make**	<to be provided by the bidder>	
2.	**Model**	<to be provided by the bidder>	
3.	1 DIN Standard Size		
4.	Shock Absorbent Design		
5.	1 x 2.5 inch Hard disk (1 TB), 1 Memory card		
6.	Wifi module (802.11 b/g/n supported, 2.4GHz)		
7.	4 Channel Realtime H.264 encoding, 25 fps		
8.	Signals, Ethernet and USB Interfaces		
9.	Temperature as per Agartala city requirements		

6.5.2.5. Electronic/ Handheld Ticketing Machine

#	Parameters	Minimum Specifications	Bidder Compliance (Yes/No)	Product Documentation Reference
1.	**Make**		<to be provided by the bidder>	
2.	**Model**		<to be provided by the bidder>	
3.	Processor	400 MHz, ARM 9 or higher		
4.	Memory	128 MB Flash, 64 MB RAM		
5.	External Memory	Micro SD card		
6.	Display	3.5 Inch, 320X240 Color TFT Touch Screen		
7.	Magnetic Card reader	Triple Track, Bi-Directional		
8.	Card slots	Minimum 2 SAM Slots		
9.	Smart card reader	Contact Smartcard reader		
10.	Contactless card reader	EMV/Rupay contactless, ISO 14443 A/B, Mifare Family		

#	Parameters	Minimum Specifications	Bidder Compliance (Yes/No)	Product Documentation Reference
		(Classic, Desfire, etc), Felica etc. contactless smartcard reader		
11.	Printer	Thermal Printer 57mm, 18 lines per second		
12.	Keypad	Minimum 15 keys		
13.	Battery	Li-ion batteries, 1800 mAH or higher		
14.	Communication	GPRS		
15.	Peripheral ports	USB OTG RS232		
16.	Security	DES, 3DES, AES, DUKPT		
17.	Environmental	As per Agartala weather conditions		
18.	Voltage	Input: 100~240VAC, 50Hz / 60Hz, 1.0A, Output: 9VDC, 2.5A		
19.	Certification	EMV Certified Level 1 & 2		
20.	Operating System	Linux / Windows/ Android (4.2 or above)		
21.	Accessories	Shoulder bag, AC Charger, Memory Card – 2GB, Extra Battery		
22.	Administration	Remote Administration, OTA for firmware, Application and Configuration		
23.	Support	Database handling API, Embedded TCP/IP Stack, Parallel Programming Support		
24.	Communication Ports	USB & RS232 – 1 Each		

6.6. Intelligent Pole

The functional requirements and technical specifications provided in the below sections are indicative and carry guiding rule. The MSI is free to offer products and solutions which meet requirements of the RFP focusing on the outcome, future scalability, security, reliability and adherence to specified SLA under this RFP, in line with applicable standards & best practices adopted in the industry. The MSI is encouraged to design an Optimised solution which is technically superior, innovative, proven, better in terms of functionality and is cost effective. Any specified parameters mentioned in the scope/technical requirement in the RFP may be considered if it is required for meeting current & future requirements during the contract period. The MSI is fully responsible for the specified outcome to be achieved.

6.6.1. Functional & Technical Requirement

6.6.1.1. Intelligent Pole

#	Minimum Specifications	Bidder Compliance (Yes/No)	Product Documentation Reference
1	**Make**	<to be provided by the bidder>	
2	**Model**	<to be provided by the bidder>	
3	**General**		
a.	Following ICT components (but not limited to) will be hosted at imtelligent poles: • LED based lighting Fixture • Cellular Antenna • Wi-Fi Access Point • CCTV camera • VMD • Environmental Sensor		
b.	The mounting structure shall consist of foundation, main structure, and accessories.		
c.	Intelligent pole should able to meet city aesthetic requirement and it should visual appealing. The poles should comply with latest industry standard		
d.	All cabling, cooling/heating etc should either be via/inside the pole or should be camouflaged (aesthetically concealed) so that it is not visible from outside		

#	Minimum Specifications	Bidder Compliance (Yes/No)	Product Documentation Reference
e.	Pole Height requirement is 12 meters. TRAI and DOT guidelines to be followed as the pole will be used as a telecom site. Any local regulations will be taken care by the Concessionaire		
f.	It should be able to support telecom technologies like GSM, WCDMA, LTE and Wi-Fi. It should also be possible to support future technologies such as 5G		
g.	It should be possible to support LED luminaries from reputed OEMs		
h.	Intelligent pole should able to support city as well telecom standards for India such as wind speed, climate, aesthetic etc		
i.	It should be possible to support connectivity for Intelligent pole		
j.	The allowed diameter will be as per the BIS regulations and wind speed requirement		

6.6.1.2. LED based Smart Street light

National Lighting Code by Bureau of Indian Standards (IS)- SP 72, 2010, IS 1944, IS 1977 and IEC Standards shall be complied for design and development of street lighting calculations, selection of lighting fixtures, lighting technologies, pole structure & erection, cable selection and sizing, insulation requirements, conductor specifications etc.

6.6.1.3. LED Specifications

The scope includes design, development, manufacturing, testing and supply of energy efficient luminaire complete with all accessories, LED lamps with suitable current control driver circuit including mounting bracket for street light and High mast light. The luminaire shall be suitable for rugged service under the operational and environmental conditions encountered during service.

6.6.1.4. Smart Street Light Solution

#	Specifications
1.	The smart street lighting solution should be able to operate in any weather conditions
2.	The smart street lighting solution should be able to communicate to the centralized software installed at Command and Control Center
3.	The solution should be able to operate the luminaires on/off, increase/decrease luminosity (Dimming) as per the command received from the centralized software. This control of smart street lights should also be available through a mobile App (compatible with iOS, Android)
4.	The software should have the capability to apply policies to the smart lighting system.

5.	The city administration should be able to see the real time status of the LED luminaires (like state, power consumption etc) on a city map view of the centralized software
6.	The city administration should be able to operate the Smart Lighting System manually too.
7.	The smart lighting solution should be able to communicate the system issue or failure to the centralized software.
8.	Should enable Over the Air (OTA) firmware update

6.6.1.5. LED Luminaire

#	Minimum Specifications
1.	High bright white power LEDs shall be used in the Luminaries and the wattage of these LEDs shall be>1W and <3W.
2.	Life span of LEDs used in the Luminaire shall be more than 50,000 hours at 70% light output.(Manufacture shall submit the proof- L70& TM 21 test report)
3.	Color rendering index (CRI) of the LEDs used in the luminaire shall be greater than 70.
4.	Color temperature of the proposed white color LED shall be 5000K-6500K
5.	Junction Temperature; Should be less than value at which LM80 (IS16105) data published. Should be >105 Degree C
6.	The distribution of luminaire illumination (control of distribution) shall be based on type of roads as per BIS standard IS 1944
7.	Power Factor:0.9
8.	Chip Efficacy: Shall be 135 lumen/watt, system lumen output at 25 degree C, supported by LM80 report shall be submitted.
9.	CRI of Luminaries: >=70 (supported by LM80)
10.	Light Uniformity ratio (Emin/ Eavg) shall be as IS 1944 based on category of road
11.	The luminaire light output (lumen) shall be constant. The voltage variations/ fluctuations in the specified voltage range shall not impinge upon the lumen it produce maximum +/-2% is allowed throughout in the input operating voltage range
12.	Operating voltage: 120 V to 270 V universal electronic driver with surge protection of 6 KV (Application IS 15885, Driver safety 16104-1/2)
13.	Total Harmonic Distortion: <15% THD Test method IEC:610003-2
14.	LEDs shall be operated at a current less than 90% of its rated current
15.	LED driver efficiency: >=350ma<=1000mA
16.	LED driver efficiency Driver (High Voltage, Low current): >85%

17.	Luminaire body temperature should not exceed 30 deg C from ambient (45 deg C) without tolerance of 10 deg. C after 24 Hrs.
18.	Heat dissipation/heat sink: Well-designed thermal management system with defined heat sink
19.	Input Current< 1000mA
20.	Should have Open Circuit protection
21.	The Luminaire shall be equipped with distortion free, clear, heat resistant, toughened, UV stabilized glass cover in the front fixed to the die cast. Aluminum frame which shall be fixed to the housing by means of stainless steel screw.
22.	The Luminaire shall be built in such a way it can withstand wind speed of 80Kmps
23.	Cover/glass without lens or with lens: Fixture cover-UV stabilized Polycarbonate/heat resistance toughened glass or equivalent will be accepted for the Luminaire without lens. For the Luminaire with lens, toughened glass be required with proper IP66 provision is preferred
24.	Frequency: 50 Hz+/-3%
25.	Operating temperature: Range -10C to +50 C
26.	Protections: IP66 for all wattage, Surge protection 6 KV, IEC61000-4-5
27.	Working humidity: 10% to 90% RH
28.	Conformation standards of Luminaire: The Luminaire should conform to IEC 60598/IS:10322. The Luminaire should be tested as per IEC 60598-2-3:2002/IS:10322 Part 5 sec-3 standards and following test reports should be submitted. Heat resistance test, thermal test, Ingress protection test, drop test electrical/insulation resistance test, endurance test, humidity test, photometry test (LM80 report) vibrant test.
29.	Finish: Aesthetically designed housing with corrosion resistant polyester powder coating
30.	Luminaire configuration/technical requirement: Side entry type. Shall consist of separate optical and color gear compartments. It should be easy replacement in the field condition
31.	Compliance: RoHS/CE/ERTL/ERDI
32.	Surge protection: External surge protection of 10 KV to be separately installed with the each fixture
33.	Lamp starting time: Max 10 sec
34.	Overall system efficacy: >85%

6.6.1.6. Wi-Fi Access Point

#	Minimum Specifications
1.	For specification on Wi-Fi Access Point, refer to section 6.7

6.6.1.7. CCTV Camera

#	Minimum Specifications
1.	For specification on Wi-Fi Access Point, refer to section 6.2

6.6.1.8. Variable Message Display

#	Minimum Specifications
2.	For specification on Wi-Fi Access Point, refer to section 6.4

6.6.1.9. Environmental Sensor

- The environment sensors shall be integrated with ICCC to capture and display/ provide feed on Temperature, Humidity, Pollutants like SoX, NoX, CoX, etc PM2.5, PM10, Noise Pollution. The data it collects is location-marked.
- Various environment sensors shall sense the prevailing environment conditions and send the data to ICCC where real time data resides and the same shall be made available to various other departments and applications for decision making.
- Then this information is relayed instantaneously to signage – large, clear, digital display screens which communicates to the citizens the prevalent environmental conditions.
- The data should be collected in a software platform that allows third party software applications to read that data..
- MSI can also make use of Variable messaging displays wherever possible.
- The sensor management platform should allow the configuration of the sensor to the network and location details etc.

Functional Specification

#	Functional Specifications
1.	The environment sensors should be have the following capabilities
2.	They should be ruggedized enough to be deployed in open air areas on streets and parks

3.	They should be able to read and report at least the following parameters • Temperature • Relative Humidity • Ambient Light • Noise • CO • NO2 • So2 • O3 • PM 2.5 • PM 10 • UVa • UVb • CO2
4.	Sensor should be able to communicate its data using wireless technology (GSM/WIFI)
5.	Data should be collected in a software platform that allows third party software applications to read that data. Data Buffer Capacity up to 3 years
6.	Data Capture Frequency – 30 seconds
7.	Li-Ion Battery Backup of 4 hours
8.	Aesthetic & Elegant Aerodynamic design
9.	Stabilization Time on power outages < 10 minutes
10.	LEDs on the enclosure for easy visual indications
11.	Software Solution • Solution to enable APIs for mobile & Web services • APIs to provide • Status of Devices • NAQI Colour Schema as per NAQI, India • Lead pollutant contributing to NAQI • Architecture to support computation of new parameters such as o Now Cast NAQI o Zonal Limits of pollutants if any
12.	Data Analytics • Lead pollutants, trends & Source level apportionments • Integration and analysis of various northbound API's including traffic / parking & Environment to derive insights.
13.	The sensor management platform should allow the configuration of the sensor to the network and also location details etc.

Technical Specification

#	Parameter	Minimum Specification
1.	Communication	3G/4G or any better technology
2.	Measurement Principle	Device should be capable of measuring • Temperature • Humidity • Ambient Light • Sound • CO • CO2 • NO2 • NOX

3.	Component Measurement Range	• NO2 upto 10ppm
		• CO upto 100 ppm
		• SO2 upto 2000 ppm
		• O3 upto 1000 ppb
		• PM 2.5 0 to 250 micro gms / cu.m
		• PM 10 0 to 450 micro gms / cu.m
		• Weather Parameters
		  ○ Temperature 0 to 100 Deg. C
		  ○ Relative Humidity upto 100%
		• Light upto 10,000 Lux
		• Noise 40 to 120 db(A)
		• UVa upto 15 mW/ cm2
		• UVb upto 15 mW/ cm2
		• CO2 upto 5000 ppm

4.	Rain Water Measurement	• Rainfall in millimeters (mm), both in quantity and intensity.
5.	Repeatability	±0.5% Full Scale

6.7. City wide Wi-Fi

ASCL intends to implement city wide Wi-Fi project to provide citizens with seamless internet connectivity so that citizens can availa e municipal services and other smart services being implemented as part of Agartala Smart City.

The functional requirements and technical specifications provided in the below sections are indicative and carry guiding rule. The MSI is free to offer products and solutions which meet requirements of the RFP focusing on the outcome, future scalability, security, reliability and adherence to specified SLA under this RFP, in line with applicable standards & best practices adopted in the industry. The MSI is encouraged to design an Optimised solution which is technically superior, innovative, proven, better in terms of functionality and is cost effective. Any specified parameters mentioned in the scope/technical requirement in the RFP may be considered if it is required for meeting current & future requirements during the contract period. The MSI is fully responsible for the specified outcome to be achieved.

6.7.1. Functional Requirement

#	Minimum Specifications	Bidder Compliance (Yes/No)	Product Documentation Reference
1	**Make**	<to be provided by the bidder>	
2	**Model**	<to be provided by the bidder>	
3	**General**		
a.	City wide Wi-Fi Network shall comprise of the following components: • Access Points (Aps) including the mounting infrastructure • WLAN Controllers		
b.	City-wide Wi-Fi shall have a secure, seamless and redundant network. It shall support industry standard based authentication procedure.		
c.	City-wide Wi-Fi services shall be provided across all public spaces and other strategic locations in consultations with ASCL/AMC		
d.	The target bandwidth proposed per end-user is 2 Mbps throughout the City on a per session basis for the 30 minutes or 50 MB per session that will be given to the user at no cost.		
e.	The system shall be designed for scalability and allow future expansions in terms of subsequent		

#	Minimum Specifications	Bidder Compliance (Yes/No)	Product Documentation Reference
	project phases, increased user density and geographical coverage.		
f.	The Wi-Fi transition from one access point to another shall be seamless. Users must be able to use same login details even if they move from one Wi-Fi zone to another.		
4	**Access Point**		
g.	The access points shall be capable of managing and configuring remotely through a wireless controller.		
h.	Wi-Fi access point shall support dual frequencies (in compliance with DoT and TRAI regulations) including both 2.4 GHz and 5 GHz spectrum. It shall support wireless mesh configuration for redundancy of the network in case of a fibre link being unavailable.		
i.	Access points shall support 802.11ac wave II multi-user MIMO.		
j.	User can create a profile which will be authenticated using his mobile number (SMS) and email		
k.	The Wi-Fi access point shall be controller based that can be managed by using Wi-Fi controller at ICCC		
5	**WLAN Controller**		
l.	Wi-Fi network shall include Wi-Fi controller to monitor, manage, and control access points from the ICCC		
m.	The controller shall ensure seamless roaming within city limits		
n.	The controllers should communicate back and forth with the centralized security system and network management system in real time		

6.7.2. Technical Requirement

6.7.2.1. WLAN Controller

#	Parameter	Specifications
1.	Hardware	Redundancy Features: Controller Must support Active: Active and Active: Standby. Same license should be shared by both the controller.
2.	General Feature Requirements	Ability to map SSID to VLAN.
3.		Should support automatic channel selection – interference avoidance (Co-channel management, Adjacent Channel Management, Channel reuse management). Internal / External Captive Portal.
4.	Auto Deployment of APs at different locations	Access points can discover controllers on the same L2 domain without requiring any configuration on the access point.
5.		Access points can discover controllers across Layer-3 network through DHCP or DNS option
6.	System Architecture	Centralized MAC addresses filtering
7.		Should support onboard/ external DHCP server
8.		Controller should support Onboard / External AAA server
9.		The proposed architecture should be based on controller based Architecture with thick AP deployment. While Encryption / decryption of 802.11 packets should be performed at the AP.
10.		Support roaming between access points deployed on same subnet and different subnets
11.	QoS features	Per user bandwidth Rate Limiting
12.		Self-healing (on detection of RF interference or loss of RF coverage)
13.		Should support per user, per device, and per application/TCP-port prioritization
14.		Dynamic load balancing to automatically distribute clients to the least loaded 802.11 channel and AP; load balancing must not require any client specific configurations or software
15.		Adaptive RF management that provides the capability to pause channel scanning / adjust RF scanning intervals based on application and load presence.
16.		Capability to provide preferred access for —fast clients over — slow clients (11n vs. 11g) in order to improve overall network performance.

17.		Support advanced multicast features with multicast rate optimization, multi-channel use and IGMP snooping
18.	RF Management	Should be able to load balance clients across channels and access points
19.		Should be able to load balance clients based on client count
20.		Should be able to load balance clients based on effective throughput on AP
21.		Should be able to use client and throughput as a measure to load balance between bands
22.	Inline Security Features	Should allow authenticated client devices to roam securely from one access point to another, within or across subnets, without any perceptible delay Security during re association.
23.		Controller should support AES-128 and AES-256 encryption, with site-to-site and client-to-site VPN capabilities; should have provision to supports IPSEC/GRE tunnels

6.7.2.2. Access Point

#	Parameter	Specifications
1.	Features	The wireless solution should be based on dual radio.
2.		802.11 a/b/g/n/ac / 2x2:3 MIMO Wave1/Wave2, dual radio , access point
3.		The Access Point should have single 10/100/1000 Ethernet interfaces
4.		The AP should be able to handle security, mesh, , RF Management, QOS , roaming, local forwarding without the need for a controller so as to increase performance of the WLAN network
5.		802.11 a/b/g/n/ac Access Point should be able to power up using standards 802.3 af/at POE input.
6.		All 2.4 GHz (2.4000GHz to 2.4835GHz) bands authorized in G.S.R. (45E)
7.		Radio 2: 2.4GHz: Chan 1-13 (2412-2472 MHz) 5GHz: All channels from 5200 MHz to 5825 MHz Actual operating frequencies depend on national regulatory limits
8.		Maximum available transmit power: 2.4GHz: 21dBm per chain, 5.0GHz: 20dBm per chain
9.		Antenna configuration: 1x1, 1x2, 2x2, 3x3
10.	Antenna Characteristics	InternalAntenna Gain or equivalent or better RF coverage as per planning
11.		2.4 GHz-2.5 GHz : 4 dBi

12.		5.150 GHz- 5.875 GHz : 5dBi
13.	Operating temperature	-10 to +60°C or better
14.	Storage Temperature	-20 to 70°C or better
15.	Regulatory	FCC certified
16.		CE Mark / WPC Compliance
17.	Enclosure	Should be IP67 rated or higher for outdoor application
18.	AP Characteristics	Able to be powered over 802.3af/at standard Power-over-Ethernet (PoE). Auto sensing, 10/100/1000 on the network port
19.		16 BSSIDs per AP
20.		On Demand Channel Scan, Auto Channel Select
21.		Capable of multi-function services including: data access, intrusion detection, intrusion prevention, location tracking, real-time non-disruptive packet capture, RF monitoring with no physical touch and no additional cost
22.		The AP should proactively probe other rates to determine if greater throughput is available, intelligently adjusting its selection tables to favor higher performance. The AP should support mesh backhaul feature in which the root AP will determine if its wired connection is down and take action correspondingly. AP should support Self-Healing, Self-forming, dynamic path selection Wireless MESH function
23.		Automatic neighbor detection and route determination
24.		AP will provide make before break handovers
25.		The wireless meshing AP shall support low hop latency (< 1 ms per hop) under clear channel conditions and high SNR
26.		MESH link should support AES encryption on the MESH link
27.		MESH link should support extending corporate network with VLAN Tags and VLAN priority tags to the remote site
28.		A wireless meshing AP with redundant links shall select an alternative route within 100 ms
29.		AP shall provide external antenna options
30.		Wi-Fi alliance 802.11ac certified APs

6.8. Digital Information Kiosk

Digital Information Kiosk (DIK) will work as a citizen hgelp guide for the locals as well as tourists coming to the city of Agartala. Detailed specification is provided below.

The functional requirements and technical specifications provided in the below sections are indicative and carry guiding rule. The MSI is free to offer products and solutions which meet requirements of the RFP focusing on the outcome, future scalability, security, reliability and adherence to specified SLA under this RFP, in line with applicable standards & best practices adopted in the industry. The MSI is encouraged to design an Optimised solution which is technically superior, innovative, proven, better in terms of functionality and is cost effective. Any specified parameters mentioned in the scope/technical requirement in the RFP may be considered if it is required for meeting current & future requirements during the contract period. The MSI is fully responsible for the specified outcome to be achieved.

6.8.1. Functional Requirement

#	Minimum Specifications	Bidder Compliance (Yes/No)	Product Documentation Reference
1	**Make**	<to be provided by the bidder>	
2	**Model**	<to be provided by the bidder>	
3	**About Agartala**		
	• Agartala City Map • History of Agartala • Environmental Information • District Jurisdiction • List of Educational Institutes & Contact Details		
4	**Law & Order**		
	• Jurisdiction wise Police Station Details • Help Desk No		
5	**Government Office Addresses, Timings, Holiday:**		
	• List of Government Offices along with Address & Contact Details • Government Offices Working Timings • Holiday List of Tripura Govt.		
6	**Agartala - Who's who?**		

#	Minimum Specifications	Bidder Compliance (Yes/No)	Product Documentation Reference
	• List of Ministers along with Office Address • List of Key Officials (IAS, TCS) • List of Key Stakeholders of Agartala (Governor, Mayor, University Vice Chancellor etc.)		
7	**Rapid Transit System:**		
	• Fare of Bus, Auto, Cab etc. • Bus Timing • Traffic Policy of the City (Brief)		
8	**Railway:**		
	Train Timing		
9	**Flight:**		
	Flight Timing		
10	**Medical Facility:**		
	• List of Govt. Hospitals • List of Doctors & Contact Details • List of Private Clinics, Nursing Home & Address • Health Related Tips • Emergency Contact Details		
11	**Tourism:**		
	• Tourist Destination of TTDCL • Tour Packages • TTDCL District information • Video of TTDCL Destination		
12	**Advertisements**		

6.8.2. Technical Requirement

#	Parameters	Minimum Specifications	Bidder Compliance (Yes/No)	Product Documentation Reference
1.	**Make**		<to be provided by the bidder>	
2.	**Model**		<to be provided by the bidder>	
3.	Screen	1. Minimum 15” LCD touch screen, 2. Shall support 1280x1024 Resolution or better, 3. Support for following features: Wide Viewing		

#	Parameters	Minimum Specifications	Bidder Compliance (Yes/No)	Product Documentation Reference
		Angle, Low Power Consumption, High Contrast ratio, High Aperture Ratio, Short Response Time; 4. Capacitive Touch Display, All-glass touch-screen with a transparent metallic conductive coating is preferred.		
4.	Computing Model	1. Platform shall support leading operating systems 2. Processor speed minimum of 1.6 GHz Intel®/equivalent Processor or better 3. Min 2 GB RAM 4. Internal persistent storage capacity of minimum 20 GB 5. Slots and support for connecting other components as required		
5.	Keyboard	Alphanumeric keyboard with minimum of 50 keys * This may be replaced with an onscreen keyboard, depending on the design		
6.	Speaker	Output: 20 Watts or better * Shall be able to deliver clear stereo sound		
7.	Microphone	1. Shall support speech based interaction during video conferencing when enabled through kiosk 2. Shall be able to isolate the main sound source and minimize background		

#	Parameters	Minimum Specifications	Bidder Compliance (Yes/No)	Product Documentation Reference
		noise, highlighting the performance		
8.	Physical Forms	• Kiosk body enclosed in a protective shell made of robust weather proof material. • IP Class of the Kiosk should be more than IP 66		
9.	Security Requirements	1. Kiosk machine shall ensure that any data stored within or being transferred is encrypted as per industry standards. Machine shall ensure no data loss to the extent possible. 2. Kiosk machine shall be equipped with sufficient tamper-proof mechanisms to ensure detection in case of physical tampering to the kiosk.		
10.	Other Requirements	1. Kiosk shall be upgradable through a central system remotely over internet 2. It shall be possible to monitor critical parameters related to health of the kiosk device remotely 3. Kiosk shall be able to provide details related to inventory requirements to central system 4. Multilingual support: Shall necessarily offer support for multiple languages including		

#	Parameters	Minimum Specifications	Bidder Compliance (Yes/No)	Product Documentation Reference
		English, Hindi and Bengali (min) 5. Kiosk shall provide for custom branding complete with signage and digital displays 6. Kiosk shall work fine under following operating conditions: • *Temperature 0°-50°C* • *Humidity 10%~90% RH Ta<40°C* • *Power: DC +12V, 100~240 V@ 60/50Hz*		
11.	Accessibility Features	Proposed Kiosk should have all latest accessibility Features to help people with disabilities use technology more easily as per the rules & regulations of Govt.		

6.9. City Network Backbone (Optical Fibre Cable)

With technology being a key driver for implementation of smart city initiatives across Agartala, a robust network is one of the key foundational requirements on which future 'Smart' initiatives shall be designed and built. Hence, an end-to-end fibre optic connectivity is envisaged as a part of this project. The planned fibre optic network infrastructure shall be capable to carry all the key services that will be implemented in due course under smart city initiatives. This dedicated fibre optic infrastructure shall be used for both ASCL and non-ASCL services (other government services and tenants). Ultimately, the ASCL fibre optic network shall be used as the underlying enabler for realizing all connectivity needs (both citizens, smart city components and sensors) to enable a digitally connected Agartala. Detailed specification is provided below.

The functional requirements and technical specifications provided in the below sections are indicative and carry guiding rule. The MSI is free to offer products and solutions which meet requirements of the RFP focusing on the outcome, future scalability, security, reliability and adherence to specified SLA under this RFP, in line with applicable standards & best practices adopted in the industry. The MSI is encouraged to design an Optimised solution which is technically superior, innovative, proven, better in terms of functionality and is cost effective. Any specified parameters mentioned in the scope/technical requirement in the RFP may be considered if it is required for meeting current & future requirements during the contract period. The MSI is fully responsible for the specified outcome to be achieved.

6.9.1. Functional Requirement

6.9.1.1. Civil Infrastructure for Fibre Optic

#	Minimum Specifications	Bidder Compliance(Yes/No)	Product Documentation Reference
1	**Make**	<to be provided by the bidder>	
2	**Model**	<to be provided by the bidder>	
3	MSI shall be providing the backbone and distribution trench for installation of fibre optic infratructure		
4	MSI shall provide the access trench for connecting building and active field devicess		
5	Manholes and handholes shall be placed at strategic locations for the fibre optic infrastructure throughout the City RoW. These manholes shall be used for placing the fibre optic splice enclosure		
6	The fibre optic cable shall be installed inside dedicated Permanently Lubricated (PLB) High Density Polyethylene (HDPE) smooth wall configuration ducts inside the trench. These HDPE ducts shall be sized to provide sufficient future growth capacity for Agartala		

#	Minimum Specifications	Bidder Compliance(Yes/No)	Product Documentation Reference
7	The HDPE duct shall be suitable for underground fibre optic cable installation by blowing as well as conventional pulling		
8	The HDPE duct shall be suitable for laying in RCC trench, trenches by directly burying, and laying through trenchless digging i.e. Horizontal Directional Drilling (HDD)		
9	All HDPE ducts shall be colour coded as per EIA/TIA 598 standard.		
10	MSI is expected to put in practices for precaution against damage by Termites & Rodents. In the rodent prone areas, Optical Fiber cable joint closures shall be applied with BHC 10% dust (Benzene Hydro chloride 10%) to prevent rodent & termite damage.		

6.9.1.2. Optical Fibre Cable

#	Minimum Specifications
1	One single mode optical fibre cable (OFC), loose tube, armoured cable configuration for End to End fibre optic infrastructure
2	All fibre optic cable shall be ordered in standard tube and colour configuration based on latest industry standard (such as EIA/TIA 598, etc.)
3	Each of the POPs and ICCC shall be connected over a dedicated 1x 48 (or more) core fibre optic cable. It will only be terminated at the POPs and ICCC location and will have redundant entry and exit paths
4	For distribution, a dedicated 48 (or more) core fibre optic cable will be provided end-to-end in the respective zone

6.9.1.3. Copper Cable & Accessories

#	Minimum Specifications	Bidder Compliance(Yes/No)	Product Documentation Reference
1	**Make**	<to be provided by the bidder>	
2	**Model**	<to be provided by the bidder>	
3	Outdoor-rated Unshielded Twisted Pair (UTP) Communications Category (CAT) 6 Cable with armouring to provide Ethernet connectivity between network switches and end devices such as CCTV, Wi-Fi, etc. located within 70 m from the switch location		

#	Minimum Specifications	Bidder Compliance(Yes/No)	Product Documentation Reference
4	The UTP cable shall be outdoor-rated UTP CAT 6 armoured cable and shall have a guaranteed transmission performance up to 250 MHz.		
5	Wherever installed, the UTP cables shall be supplied with either in-built surge suppressor or shall have additional surge suppressors as specified.		
6	Each conductor of the UTP cable shall be insulated with a coloured high density polyethylene jacket with varying twisted length to minimize crosstalk		
7	Additional accessories to include CAT 6 Patch Cords required for data communications connections, CAT6 Patch Panels for cable termination and Surge Suppressors for protection from voltage spikes as per the design requirements		
8	The surge arrestor shall be such that they do not interfere with normal communications		
9	The termination shall protect the cable terminations from water and mechanical damage and shall be resistant to salt corrosion		

6.9.1.4. Fibre Optic Accessories

#	Minimum Specifications	Bidder Compliance (Yes/No)	Product Documentation Reference
1	**Make**	<to be provided by the bidder>	
2	**Model**	<to be provided by the bidder>	
3	**Optical Connectors**		
	Optical connectors shall be used to terminate optical fibre for their interconnection and distribution.		
4	**Fibre Patch Cord**		
	Fibre Patch cords shall be used to connect Fibre Termination Panel to the network switch		
5	**Fibre Optic Patch Panel**		
	• Fibre Optic Patch Panels shall be installed at termination location at POP, ICCC, and at every field switch location		

#	Minimum Specifications	Bidder Compliance (Yes/No)	Product Documentation Reference
	• The Patch panels shall be capable of supporting SC type ports for backbone and distribution and SC/ST/LC type ports for access • The Patch panels shall have the capacity for terminating the number of fibre as per the project requirement		
7	**Active Electronics**		
	• Industrial grade Layer-2 Ethernet switches shall be installed at the field for connectivity to field devices. These Layer 2 switches may support POE/POE+ as per the MSI's design requirements to connect various field devices. • Stacked and interconnected Layer-2, industrial grade Ethernet switches shall be installed at field cabinets for distribution to field devices and plots • Layer 3 based Ethernet Switch/Router at all the Point of Presence (POP) and ICCC locations for communication between the POPs and ICCC • Each of the Layer 2 switch at the field (access switch) shall support at least 1 Gbps fibre per port for access and 1 Gbps for backhaul uplinks • The switches from any one vendor shall be interoperable with other brands		
8	**Connectivity Requirements**		
	Fibre optic infrastructure shall fulfil connectivity needs of all the smart city components, field devices, sensors etc. envisaged as part of the Project		

6.9.2. Technical Requirement

6.9.2.1. HDPE Duct

#	Minimum Specifications	Bidder Compliance(Yes/No)	Product Documentation Reference
1	**Make**	<to be provided by the bidder>	
2	**Model**	<to be provided by the bidder>	
3	At a minimum the HDPE duct shall meet or exceed the applicable industry standards as listed below: • Indian standards including IS:4984 - specifications for HDPE duct • ISO standards (ISO 9001, ISO 14000) • ASTM standards • TEC specifications • Other standards as detailed in this specification		
4	The HDPE ducts shall be installed for the distance as approved with ASCL. They will be used for backbone, distribution and access communications		
5	The HDPE ducts shall be ordered in different configurations and colours as detailed in the functional requirements. These colours shall be maintained throughout the useful life of the duct		
6	The 40mm (OD) with 3.5mm wall thickness and 20mm (OD) with 2.0mm wall thickness coilable HDPE ducts shall be of smooth configuration and shall be suitable for outdoor underground installations		
7	All HDPE ducts shall be continuous. Where the duct reel ends, the HDPE ducts shall be joined using approved industry standard couplers or inside manholes/handholes		
8	Sheathing Raw Material: • Shall be per IS 2530 • The Melt Flow Index shall be as per IS 33 • The outer sheath thickness shall be in the range 1.2 mm +/- 0.2 mm		
9	The duct shall be free from visual defects like blisters, shrink holes, flaking, scratches groove lines & roughness. The duct shall also have in build rodent protection capabilities		
10	To reduce the friction between the cable and HDPE, a suitable lubricant may be continuously applied		

#	Minimum Specifications	Bidder Compliance(Yes/No)	Product Documentation Reference
	with a sponge to the cable surface during pulling. The standard lubricants with low frictional coefficient may be used. User of Telecom Duct may be adopted. Telecom Duct is an advanced pre-lubricated duct system. Lubricants are built in to a durable polymer base. Duct has a low coefficient of friction and the built in lubricants do not diminish with age.		
11	The duct shall be supplied with at least 0.6mm diameter in-built copper tracer wire. The tracer wire shall be 12 gauge, copper 600V insulated blue wire in all empty conduits.		

6.9.2.2. Laying of HDPE duct in Open Trench

#	Minimum Specifications	Bidder Compliance(Yes/No)	Product Documentation Reference
1	**Make**	<to be provided by the bidder>	
2	**Model**	<to be provided by the bidder>	
3	HDPE ducts shall be laid in open trench or using HDD technique		
4	The duct trench shall be dug for the distance as per route plan (indicating the various dimensions and other details of the trench) approved by the ASCL for each type of soil type		
5	Due care and precaution during excavation shall be taken to avoid possible damage of any other underground plans/facilities		
6	The minimum depth at which the duct shall be laid will be in compliance with DOT norms and telecom best practices		
7	The width of trench at the top and bottom shall be adequate for proper installation of HDPE ducts with required quantities		
8	The backfilling and compacting of trench in layers of 200 mm, restoration of road, nalla, pavements etc. after the completion of laying work		
9	No debris shall be allowed in backfill at any time		
10	**Other Installation Requirements**		

#	Minimum Specifications	Bidder Compliance(Yes/No)	Product Documentation Reference
	During transportation and storing at the site duct, it is necessary to seal the ends of the duct with proper End caps against water penetration or other impurities		
	When placing multiple ducts in a single trench simultaneously, it is important not to cross or twist the ducts inside the trench, when installing large quantities of ducts it is possible to stack them one on top of the other in addition to side by side.		
	Positioning of the ducts must be designed in the planning stage to ensure clarity between ducts placement		
	Both ends of the duct must be properly sealed with end plug to prevent water, dust or any other foreign particle from entering into the duct		
	Pump out water, if any, from the trench before placement of duct		
11	**Testing**		
	All applicable testing have to be done before handing over to ASCL		

6.9.2.3. Optical Fibre Cable

#	Minimum Specifications	Bidder Compliance(Yes/No)	Product Documentation Reference
1	**Make**	<to be provided by the bidder>	
2	**Model**	<to be provided by the bidder>	
3	**The single mode optical fibre shall meet or exceed following Industry Standard**		
4	ITU-T G.652- Characteristics of a single-mode optical fibre and cable		
5	ANSI/ICEA S-87-640-1999 - Standard for Optical Fibre Outside Plant		
6	Telcordia GR-20: Generic Requirements for Optical Fibre and Optical Fibre Cable.		
7	All applicable TIA/EIA standards for single mode fibre cable and those listed in these technical requirements		

#	Minimum Specifications	Bidder Compliance(Yes/No)	Product Documentation Reference
8	The single mode optical fibre shall enable dual operating wavelengths at 1310nm and 1550nm nominal		
9	Single mode fibre shall have attenuation not greater than 0.36 dB/km at 1310 nm and 0.25 dB/km at 1550 nm		
10	The single mode fibre optic cable shall be armoured cable that shall be suitable for outdoor installations, with protection against rodents		
11	Fibre optic cable shall be able to withstand a high pulling tension		
12	The optical fibre coating and/or buffer shall consist of materials that are environmentally stable in order to reduce long term effects of stress corrosion caused by moisture absorption		
13	All fibre optic cables shall be spliced inside dedicated manholes as per the Project requirements		
14	The entire fibre length shall be capable of withstanding a potential high tensile stress		
15	Dry water-blocking materials shall be applied over the cable core to prevent the ingress of water, and movement along the cable sheath		
16	The cabled optical fibre shall maintain mechanical and optical integrity through an operational temperature range according to the city requirement		
17	**Installation Requirement**		
	Each cable shall be reeled in such a way that both ends of the cable are readily accessible for testing, without any need for unreeling.		
	The outer jacket of the cable shall be fungus inert and shall be suitable for long term exposure to sunlight and weather		

6.9.2.4. UTP Copper Armoured Cable and Accessories

#	Minimum Specifications	Bidder Compliance(Yes/No)	Product Documentation Reference
1	**Make**	<to be provided by the bidder>	
2	**Model**	<to be provided by the bidder>	
3	The cable shall comprise of uniformly twisted insulated conductor pairs. Each pair shall have		

#	Minimum Specifications	Bidder Compliance(Yes/No)	Product Documentation Reference
	different colour insulation for identification and the two cores of any one pair shall also have different coloured insulation for the identification of a specific core		
4	The laid up core shall be wrapped with aluminium tape and bonded with an overlap to provide 100% shielding.		
5	Conductors shall be twisted to form pairs with an average mutual capacitance of less than 56 nF/km with a far end crosstalk loss of 69 dB/km or better.		
6	The cable shall have a water repellent filled core and shall have a sunlight and weather resistant jacket of polyethylene		
7	The cable shall have a guaranteed transmission performance up to 250 MHz.		
8	Materials used in the cable shall not support galvanic action		

6.9.2.5. Copper Patch Cords

#	Minimum Specifications	Bidder Compliance(Yes/No)	Product Documentation Reference
1	**Make**	<to be provided by the bidder>	
2	**Model**	<to be provided by the bidder>	
3	Patch cords fabricated from UTP cable shall be of suitable length to connect field devices with the switch/ FTP. Patch cords shall be sized to minimize excess cable interconnecting equipment, with cables routed and dressed to maintain a neat appearance		
4	Patch cords shall be terminated with 8-pin 8-conductor “RJ-45” style connectors		
5	All cabling and connectors shall be in accordance with ANSI/TIA/EIA-568-B.		

6.9.2.6. Copper Patch Panels

#	Minimum Specifications	Bidder Compliance(Yes/No)	Product Documentation Reference
1	**Make**	<to be provided by the bidder>	
2	**Model**	<to be provided by the bidder>	
3	The copper communication cable shall be terminated at the associated patch panel or field device		
4	The patch panels shall be sized to support the design requirements		
5	The standard termination is to be according to ANSI/TIA/EIA-568A		
6	All cable entries shall be provided with appropriate cable pathway		
7	Any provided patch panel or wall plate shall provide mechanical support for all connections enclosed and shall maintain insulation between them		
8	All material of the termination and associated mounting accessories shall be non-reactive and the complete assembly shall not support galvanic cell action		
9	The termination shall protect the cable terminations from water and mechanical damage and shall be resistant to salt corrosion		

6.9.2.7. Fibre Optic Splice Closure

#	Minimum Specifications	Bidder Compliance(Yes/No)	Product Documentation Reference
1	**Make**	<to be provided by the bidder>	
2	**Model**	<to be provided by the bidder>	
3	Be capable of accepting minimum six (6) cables in a butt splice configuration. Any additional cables shall be supported using standard accessories provided by the manufacturer		
4	Fibre Optic Splice Closures shall be IP 68 rating		
5	Shall be constructed of non coroshive materal. Shall be water resistant		

6.9.2.8. Fibre Patch Cords

#	Minimum Specifications	Bidder Compliance(Yes/No)	Product Documentation Reference
1	**Make**	<to be provided by the bidder>	
2	**Model**	<to be provided by the bidder>	
3	**Patch cord material shall conform to the following standards at a minimum**		
4	House a single fibre in a 900 micron tight buffer tube.		
5	Be available in duplex configurations		
6	Both mating faces of each connector shall be cleaned using fibre optic cleaning solvent cleaning wipe or patch prior to mating the connector surfaces.		
7	House the tight buffer in a flame retardant jacket with space between the jacket and tight buffer filled with Kevlar strength components		

6.9.2.9. Fibre Patch Panel

#	Minimum Specifications	Bidder Compliance(Yes/No)	Product Documentation Reference
1	**Make**	<to be provided by the bidder>	
2	**Model**	<to be provided by the bidder>	
3	The Patch panels shall adhere to Telecordia GR-449 Core or equivalent specifications		
4	The Patch panels shall be capable of supporting SC type ports for backbone cabling and SC/ST/LC for distribution and access cabling		
5	The Patch panels shall include the mounting hardware for EIA/TIA standard racks as per rack requirements.		
6	The Patch panels shall provide a minimum of four cable entry points		
7	The Patch panels shall support rings to maintain minimum fibre bending radius, and to prevent accidental physical damage		
8	The Patch panels shall provide physical protection for the individual fibres		
9	The Patch panels shall provide terminating facilities for fibre optic connectors, including the through adapter		

#	Minimum Specifications	Bidder Compliance(Yes/No)	Product Documentation Reference
10	The Patch panels shall provide bulkhead mounting hardware for a variety of connectors but shall be equipped with SC and SC/ST/LC connectors unless otherwise noted		

6.9.2.10. Switches

#	Minimum Specifications	Bidder Compliance(Yes/No)	Product Documentation Reference
1.	**Make**	<to be provided by the bidder>	
2.	**Model**	<to be provided by the bidder>	
Ethernet Switch – Layer 2- Industrial Grade Field Switch			
3.	The industrial grade switches shall support – • IEEE 802.3, 802.3u, 802.3ab, 802.3z, 802.3x protocols. • IEEE 802.1D for STP, 802.1w for Rapid STP, 802.1s for Multiple Spanning Tree Protocols. • IEEE 802.1q for VLAN tagging, 802.1p for CoS, 802.1X for Authentication and 802.3ad for port trunk LACP. • Broadcast storm protection, port lock/port security, RADIUS, TACAS+, SSL/SSH security		
4.	The industrial grade switches shall support – • IPv4/v6, SNMP v1/v2/v3, LLDP, port mirror, RMON, Server/Client, DHCP, TFTP, Telnet, Flow control, IGMP v1/v2		
5.	All switches installed on-field shall be capable of working in the harsh environmental conditions with immunity to EMI and heavy electrical surges. They shall support: • EN-60950-1 or equivalent • EN 55022/24 or CISPR 22 • FCC Part 15B Class A • IEC 60068-2-27 and 2-32 or equivalent • IEC 60068-2-6 or equivalent		
6.	The switches shall be powered by 12/24/48VDC or 24VAC input as per the design requirements with dual redundant inputs and integrated power supply. The terminal blocks for the power supply options shall support reliable, maintenance-free connections		
7.	The industrial grade switches shall support operating temperature range of 0°C to +65°C (without any fans) with ambient relative humidity of 5-95%, non-condensing.		

#	Minimum Specifications	Bidder Compliance(Yes/No)	Product Documentation Reference
8.	All Layer 2 Ethernet switches shall be managed switches and shall comply with IEEE standards, Safety Standards, Electromagnetic Emissions standards		
9.	All Layer 2 switches at a minimum shall support the following: • IPv4/IPv6 • CoS • IP Multicast • Security • Storm Control • Dynamic Trunking Protocol • Spanning Tree Route Guard • Secure Sockets Layer (SSL)/SSH • Network Management • Non-Blocking Type • Support Auto-Sensing • Support Auto-Negotiation		
10.	The fibre optic ports shall support the required distance i.e. between switches at different locations		
11.	All switches shall support standard 19" rack mount or DIN rail mounting options. In addition, the industrial grade switches shall also support mounting on streetlight poles and shall be compact style		
12.	All switches shall have the function to enable/disable ports for limiting unauthorized access to the network		
13.	**All switches shall support** • SNMP (v1/v2/v3) to allow for management • Network Time Protocol (NTP) for time synchronization • Multilevel user passwords for prevention against unauthorized configuration • SSH or SSL based security and MAC based port security • RADIUS authentication service		
14.	The device shall have LED indicators for Power, LAN, Signal, RS-232, and Ethernet Link & Activity		
Ethernet Switch & Router – Layer 3			
15.	**Type 1: Backbone Ethernet Switch/Router** • The Layer 3 based backbone Ethernet switch/router shall be installed for backbone connectivity • The Layer 3 based backbone Ethernet switch/router shall have minimum 8 SFP+ ports that are a minimum SFP+ links with 40 Gb/s connectivity including Copper and Fibre ports as per the design requirements. These		

#	Minimum Specifications	Bidder Compliance(Yes/No)	Product Documentation Reference
	ports shall support hot swap modules to support upgrade of ports in the future. Any attenuators required for inter-switch connectivity shall be provided by MSI. • The backbone switch/router shall have a minimum switching capacity of 640 Gbps, non-blocking. • The backbone switch/router shall support IP/MPLS connectivity and shall be carrier grade. This clause shall not apply for Server/Workstation switches		
16.	**Type III – Server/Workstation Connectivity Ethernet Switch – Minimum 48 Ports** • The Layer 3 based Ethernet switch shall be installed for connectivity to servers and workstations at ICCC and POP • The Layer 3 based Ethernet switch shall have a minimum of 48 ports Ethernet interface with a combination of 1/10 Gig SFP+ ports.		
17.	All Layer 3 Ethernet switches shall be managed switches and shall comply with IEEE standards, Safety Standards, Electromagnetic Emissions standards		
18.	All layer 3 switches/routers shall support IP/MPLS based networking (except for switches for servers/workstation)		
19.	All switches/routers shall support standard 19" rack mount or DIN rail mounting options		
20.	The switches/routers shall support at least one (1) dual personality port (RJ-45 or USB micro-B) serial console port		
21.	The switches/routers shall support operating temperature range of 0°C to +40°C with ambient relative humidity of 10-90% non-condensing		
22.	The backbone switches/routers shall be powered by 220-240VAC, 50Hz input as per the design requirements with hot swappable dual redundant power supply and redundant variable speed fans		

6.10. Geographical Information System (GIS) Platform

GIS mapping and creation of layers are important component for the successful implementation of Smart City project. GIS maps and mapping of assets allows to identify exact location and thus provide services accordingly. It is very important for the city to have a proper base map with all the layers and assests mapped in it.

The functional requirements and technical specifications provided in the below sections are indicative and carry guiding rule. The MSI is free to offer products and solutions which meet requirements of the RFP focusing on the outcome, future scalability, security, reliability and adherence to specified SLA under this RFP, in line with applicable standards & best practices adopted in the industry. The MSI is encouraged to design an Optimised solution which is technically superior, innovative, proven, better in terms of functionality and is cost effective. Any specified parameters mentioned in the scope/technical requirement in the RFP may be considered if it is required for meeting current & future requirements during the contract period. The MSI is fully responsible for the specified outcome to be achieved.

6.10.1. Functional Requirement

6.10.1.1. Creation of Base Map and Layers

#	Minimum Specifications	Bidder Compliance(Yes/No)	Product Documentation Reference
1	**Make**	<to be provided by the bidder>	
2	**Model**	<to be provided by the bidder>	
3	MSI shall have to created city base map on GIS Platform		
4	MSI shall have to create all the layers relevant for the city. The list of layers to be discussed and finalized with ASCL		

6.10.1.2. Data Services

#	Minimum Specifications	Bidder Compliance(Yes/No)	Product Documentation Reference
1	**Make**	<to be provided by the bidder>	
2	**Model**	<to be provided by the bidder>	
3	MSI shall finalize the dataset with all its structure & metadata for approval		
4	MSI shall carry out dataset creation & integration requirement study with stake holders and submit SRS (System Requirement Study) and Architecture		

#	Minimum Specifications	Bidder Compliance(Yes/No)	Product Documentation Reference
	document for approval by considering following factors (not limited to): • Best GIS practices shall be followed in spatial positional accuracy, GIS layers overlay matching accuracy, data correctness and completeness • All required Data Modelling, Design shall be carried out by MSI to get Design Document approved from client • Scale of mapping shall be 1:1000 or better as per requirement • Integration, Export & Import of various formats of data such as KML, JSON, Shape Files, XLS, XML, etc. with external systems • 3D Data of city		
5	All required data (spatial and non-spatial) are to be arranged by MSI. Client will help by issuing required authorization letters.		
6	MSI shall carry out collection of data from various agencies or Government departments		
7	Data creation - Necessary Survey, collection from various sources, compilation, digitization, accurate geo-referencing, migration, data conversion, integration & maintenance shall be carried out by MSI		

6.10.1.3. Creation and Integration of Different Modules

#	Minimum Specifications	Bidder Compliance(Yes/No)	Product Documentation Reference
1.	**Make**	<to be provided by the bidder>	
2.	**Model**	<to be provided by the bidder>	
Property Tax			
3.	Property Tax /Land administration platform should seamlessly integrate with field operations and should securely connect to disparate systems to maintain the integrity of survey data. This GIS platform should support in creating and maintaining cadastral data and should streamline work processes and speeds the enrollment of new parcels including		

#	Minimum Specifications	Bidder Compliance(Yes/No)	Product Documentation Reference
	• Tax Parcel editing including the tools, workflow, topology, error checking, version management, and historic rollback that make mapping and public records tasks quick and easy. System should be able to identify GIS tax data errors based on set of rules and behaviors that model how points, lines, and polygons share coincident geometry. • Support field data collection to collect data against a map or form-based data and integration with Enterprise cadastral system and track tax payment status per plot		
4.	The attribute data with the property must store (but not limited to) data such as: • Property location geographic • Property location address • Status (vacant / sold) • Current use • Owner ship details • Property tax details • Utility details		
Utility Asset Management System			
5.	MSI shall create different asset datasets and map the assets in the GIS platform. The asset data would be created for roads, water supply lines, sewage lines, storm water drains, electricity lines. The attribute shall include the following: • The location details • The geometry details • The engineering details • The attached property details		
6.	The sub-modules should have the following functions: • GIS based Asset data visualization • GIS based asset maintenance management • GIS based asset construction management • GIS based web ticketing for complaint registration and solution		
7.	The user should be able to annote the Place where the asset management activity is proposed by inserting a point/Line on the map and shall be created and saved in Project layer		
8.	Asset dataset creation and Management		

#	Minimum Specifications	Bidder Compliance(Yes/No)	Product Documentation Reference
	• Searching of Zone/Ward/ GIS layers: • Built-up area for any property maintenance and Rent • Land use land cover area for Vacant land • Transportation for any road maintenance • Sewage and Drainage for Maintenance • Public Lighting for maintenance • The Vacant Land will be linked with Asset Management-Asset Report • Query can be generated on project layer for Rent: Rent Type, Rental amount, Renewal date & Land: Market Value • The Building properties will be integrated with- Asset Management • Property Index Number		
Solid Waste Management System			
9.	• Property Index Number Indexed with Garbage Collection Point • Category of garbage collection points will be queried and viewed on Map based on PIN • Solid Waste Management-Reports-PIN, Category.		
Flood/ Earthquake Management System			
10.	Viewing of vulnerable and prone areas - • Seismic Zone or Earthquake Prone areas (High Priority) • Flood prone areas (Medium to High Priority) • Viewing of critical infrastructure at risk. This will include infrastructure such as dams, roads, bridges, flyover, railway lines, power stations, VIP and VVIP areas and Heritage building. • Hazard and Consequence Mapping on GIS platforms prepared for industry and chemical accident prone areas (High Priority) • System to facilitate all the relevant information for planning and preparedness purpose		
11.	Forecasting and early warning systems for floods and earthquake and preparedness planning		
12.	Mapping of river bed embankment and display of fissure in the embankment		

#	Minimum Specifications	Bidder Compliance(Yes/No)	Product Documentation Reference
13.	GIS platform shall allow to create Flood Risk Map showing the potential damages associated with flood scenarios in terms of monetary values plus the amount of population either affected or at risk for life		
14.	The assessment of damages and losses should be based on the combination of land use data and socio-economic statistics with flood extent information, using actual (current, historic) or potential (simulated) flood events. The initial land use information needs to be enriched by socio-economic data		
15.	This should include detailed mapping of potentially affected infrastructure in high-hazard zone in one municipality that will include critical infrastructure (life-line infrastructure, schools, police stations etc), housing, commercial and industrial facilities, transport infrastructure etc.		
Routing & Intelligent Traffic System			
16.	The GIS system should help to maintain spatial inventory of assets (roads, buildings, bridges etc.) along with asset details and condition data		
17.	GIS system should support assigning and editing network features such as barriers, turns and uni-directional flow and should provide Multipoint routing ability		
18.	The system should be capable of modeling a single mode of transportation, 3D and Multimodal networks		
19.	The software should help to track the location on real-time, in scheduling and determining the optimum number of vehicles required on the road, and optimal routing tools for multiple vehicles to reduce fuel consumption and therefore create a smaller carbon footprint		
20.	The routing system should support to determine the best route assignment and order sequence		
21.	GIS system should be able to identify the closest facility along the transportation network		
Analytics			

#	Minimum Specifications	Bidder Compliance(Yes/No)	Product Documentation Reference
22.	Server Software should support On-premise and cloud based Big data analysis of spatial data using Vector & Tabular data		
23.	Server Software should support batch geocode on big tables, CSV files, and Excel files		
24.	Server Software should support to analyse millions of geospatial records on-premise and Cloud to: • Aggregate Points based on proximity or administrative boundary • Should support Spatial, temporal, and attribute relationships to join features together • Reconstruct Tracks based on time stamps captured • Software should support to identify overlap between two layers and calculate statistics about the overlap • Based on the criteria specified, Software should support to Find Similar Locations • Software should be able to identify trends in the cluster of point densities to spatially locate the new, consecutive, intensifying, persistent, diminishing, sporadic, oscillating and historical hot and cold spots		

6.10.2. Technical Requirement

6.10.2.1. Proposed datalist which to be created, mapped and integrated

#	Data Sets	Functions List	Module
1.	Water Supply	• Network Display • Asset management functions	Maps and Asset Management
2.	Electrical Network	• Network Display • Asset management functions	
3.	Storm Water	• Network Display • Asset management functions	Maps and Asset Management
4.	Property Tax (Integration with AMC Property Tax Management)	• Tax status and Management	Other Services
5.	Road Network (Links & Node structure based)	• Routing, Travel direction & other Navigation support • Integration with ICOMC	Maps & Other Services
6.	Google Maps	• Integration	Maps

#	Data Sets	Functions List	Module
7.	Air & Water Quality	• Environment KPI	Maps & Other Services
8.	Industrial Areas, IT Hubs, Upcoming Ports	• Regional Economic Hub Analysis	Maps & Other Services
9.	Informal Settlements, Affordable Housing	• Housing for all Analysis	Maps & Other Services
10.	Open Space, Mixed Landuse	• Community KPI, Mobility KPI	Maps & Other Services
11.	Earthquake, Flood, Cyclone	• Eco Analysis	Maps & Other Services
12.	Housing layouts, Available plots, Upcoming schemes	• Housing reports	Other Services
13.	3D Data	• 3D visualization, urban analysis	Other Services
14.	ICCC Data and Smart Components	• Different systems from smart elements	Dashboard

6.11. Artificial Intelligence System with Edge Analytics

The functional requirements and technical specifications provided in the below sections are indicative and carry guiding rule. The MSI is free to offer products and solutions which meet requirements of the RFP focusing on the outcome, future scalability, security, reliability and adherence to specified SLA under this RFP, in line with applicable standards & best practices adopted in the industry. The MSI is encouraged to design an Optimised solution which is technically superior, innovative, proven, better in terms of functionality and is cost effective. Any specified parameters mentioned in the scope/technical requirement in the RFP may be considered if it is required for meeting current & future requirements during the contract period. The MSI is fully responsible for the specified outcome to be achieved.

6.11.1. Edge Analytics

The proposed Edge Analytics should have following mentioned minumim specifications:

1. Should deliver 5.5 teraFLOPS of FP16 performance or better
2. Support Wi-Fi, Bluetooth, 3G/LTE connectivity options
3. Should have 100Mb/1GbE management network link
4. Should support 1GbE (via RJ45) or 10GbE (SFP+)
5. Should have minimum operating temperature to withstand outdoor operating environment as per city conditions

6.11.2. Artificial Intelligence

Artificial Intelligence with Continuous Learning & Improvement system:

1. Should deliver processing units' performance of 1 petaFLOPS on FP16 or better
2. Should have software tools for achieving the following tasks- Resource allocation, queueing of jobs, performance monitoring and creating software containers
3. Should support commonly used Deep Learning based AI frameworks like TensorFlow, CNTK etc.
4. Should have minimum 512GB system memory per system or batter
5. Should have dual 10GbE and 4 IB EDR per system.
6. Should have minimum power consumption requirements
7. Should have dual 20-core Intel Xeon E5-2698 or better per system.
8. Should support parallel computing architecture.
9. Should support software libraries for continuous learning and improvement for betterment of Intelligent video analytics software installed in edge/field devices using Deep Learning based AI methodologies.

6.12. Technical Specifications & Functional Specifications– Data Cente

The Data Center will be hosted at the State Data Center (SDC). The MSI shall be able to leverage below mentioned component provided by the SDC:

a. Core Router
b. Firewall
c. Intrusion Management System
d. Enterprise Management Systems (EMS)
   - Network Monitoring System
   - Server Monitoring System
   - Helpdesk System
e. Centralized Anti-virus Solution
f. Data Link Protection (DLP) Tool
g. End Point Zero Day Malware protection
h. Threat Analysis tool License
i. DDoS

All the above mentioned components shall be provided by SDC. MSI shall discuss and confirm with ASCL for the availability of above mentioned components in the SDC. Rest below mentioned components will be under the scope of MSI.

The functional requirements and technical specifications provided in the below sections are indicative and carry guiding rule. The MSI is free to offer products and solutions which meet requirements of the RFP focusing on the outcome, future scalability, security, reliability and adherence to specified SLA under this RFP, in line with applicable standards & best practices adopted in the industry. The MSI is encouraged to design an Optimised solution which is technically superior, innovative, proven, better in terms of functionality and is cost effective. Any specified parameters mentioned in the scope/technical requirement in the RFP may be considered if it is required for meeting current & future requirements during the contract period. The MSI is fully responsible for the specified outcome to be achieved.

6.12.1. Internet Router

#	Parameters	Minimum Specifications	Bidder Compliance (Yes/No)	Product Documentation Reference
1.	**Make**		<to be provided by the bidder>	
2.	**Model**		<to be provided by the bidder>	
3.	Multi-Services	Should deliver multiple IP services over a		

#	Parameters	Minimum Specifications	Bidder Compliance (Yes/No)	Product Documentation Reference
		flexible combination of interfaces		
4.	Ports	As per overall network architecture proposed by the bidder, the router should be populated with required number of LAN/WAN ports/modules, with cable for connectivity to other network elements.		
5.	Speed	As per requirement, to cater to entire bandwidth requirement of the project.		
6.	Interface modules	Must support minimum 2* 10G Port with necessary SFP+ Modules. Must have capability to interface with variety interfaces.		
7.	Protocol Support	Must have support for TCP/IP, PPP Must support IPSEC VPN		

#	Parameters	Minimum Specifications	Bidder Compliance (Yes/No)	Product Documentation Reference
		Must have support for integration of data and voice services Routing protocols of RIP, OSPF, and BGP. Support IPV4 & IPV6		
8.	Manageability	Must be SNMP manageable		
9.	Scalable	• The router should be scalable. For each slot multiple modules should be available. • The chassis offered must have free slots to meet the scalability requirement of expansion of the project in the future.		
10.	Traffic control	Traffic Control and Filtering features for flexible user control policies		
11.	Remote Access	Remote access features		
12.	Redundancy	• Redundancy in terms of Power		

#	Parameters	Minimum Specifications	Bidder Compliance (Yes/No)	Product Documentation Reference
		supply(s). Power supply should be able to support fully loaded chassis • All interface modules, power supplies should be hot-swappable		
13.	QOS Features	• RSVP • Priority Queuing • Policy based routing • Traffic shaping • Time-based QoS Policy • Bandwidth Reservation / Committed Information Rate		

6.12.2. Data Center Switch (Manageable)

(To be used for Data centre LAN Switch)

#	Parameters	Minimum Specifications	Bidder Compliance (Yes/No)	Product Documentation Reference
1.	**Make**		<to be provided by the bidder>	
2.	**Model**		<to be provided by the bidder>	
3.	Ports	• 24 or 48 (as per requirements) 10/100/1000 Base-TX Ethernet		

#	Parameters	Minimum Specifications	Bidder Compliance (Yes/No)	Product Documentation Reference
		ports and extra 2 nos of Base-SX/LX ports • All ports can auto-negotiate between 10Mbps/ 100Mbps/ 1000Mbps, half-duplex or full duplex and flow control for half-duplex ports.		
4.	Switch type	Layer 3		
5.	MAC	Support 8K MAC address.		
6.	Backplane	56 Gbps or more Switching fabric capacity (as per network configuration to meet performance requirements)		
7.	Forwarding rate	Packet Forwarding Rate should be 70.0 Mbps or better		
8.	Port Features	Must support Port Mirroring, Port Trunking and 802.3ad LACP Link Aggregation port trunks		
9.	Flow Control	Support IEEE 802.3x flow control for full-duplex mode ports.		

#	Parameters	Minimum Specifications	Bidder Compliance (Yes/No)	Product Documentation Reference
10.	Protocols	• Support 802.1D, 802.1S, 802.1w, Rate limiting • Support 802.1Q VLAN encapsulation, IGMP v1, v2 and v3 snooping • 802.1p Priority Queues, port mirroring, DiffServ • Support based on 802.1p priority bits with at least 8 queues • DHCP support & DHCP snooping/relay/optional 82/ server support • Shaped Round Robin (SRR) or WRR scheduling support. • Support for Strict priority queuing & Sflow • Support for IPV6 ready features with dual stack • Support up-to 255 VLANs and up-to 4K VLAN IDs		
11.	Access Control	• Support port security		

#	Parameters	Minimum Specifications	Bidder Compliance (Yes/No)	Product Documentation Reference
		• Support 802.1x (Port based network access control). • Support for MAC filtering. • Should support TACACS+ and/or RADIUS authentication		
12.	VLAN	• Support 802.1Q Tagged VLAN and port based VLANs and Private VLAN • The switch must support dynamic VLAN Registration or equivalent • Dynamic Trunking protocol or equivalent		
13.	Protocol and Traffic	• Network Time Protocol or equivalent Simple Network Time Protocol support • Switch should support traffic segmentation • Traffic classification should be based on user-definable application types: TOS, DSCP, Port		

#	Parameters	Minimum Specifications	Bidder Compliance (Yes/No)	Product Documentation Reference
		based, TCP/UDP port number		
14.	Management	• Switch needs to have RS-232 console port for management via a console terminal or PC • Must have support SNMP v1,v2 and v3 • Should support 4 groups of RMON • Should have accessibility using Telnet, SSH, Console access, easier software upgrade through network using TFTP etc. Configuration management through CLI, GUI based software utility and using web interface		

6.12.3. Data Center Switch

(To be used as Top of the Rack (TOR) switch if required)

#	Parameter	Minimum Specifications	Bidder Compliance (Yes/No)	Product Documentation Reference
1.	**Make**		<to be provided by the bidder>	
2.	**Model**		<to be provided by the bidder>	
3.	Ports	• 24 or 48 (as per density required)		

#	Parameter	Minimum Specifications	Bidder Compliance (Yes/No)	Product Documentation Reference
		1G/ 10G Ethernet ports (as per internal connection requirements) and extra 2 numbers of Uplink ports (40GE) • All ports can auto-negotiate between all allowable speeds, half-duplex or full duplex and flow control for half-duplex ports.		
4.	Switch type	Layer 3		
5.	MAC	Support 32K MAC address.		
6.	Backplane	Capable of providing wire-speed switching		
7.	Throughput	500 Mbps or better		
8.	Port Features	Must support Port Mirroring, Port Trunking and 802.3ad LACP Link Aggregation port trunks		
9.	Flow Control	Support IEEE 802.3x flow control for full-duplex mode ports.		
10.	Protocols	• IPV4, IPV6 • Support 802.1D, 802.1S, 802.1w, Rate limiting • Support 802.1X Security standards • Support 802.1Q VLAN encapsulation,		

#	Parameter	Minimum Specifications	Bidder Compliance (Yes/No)	Product Documentation Reference
		IGMP v1, v2 and v3 snooping • 802.1p Priority Queues, port mirroring, DiffServ • DHCP support • Support up to 1024 VLANs • Support IGMP Snooping and IGMP Querying • Support Multicasting • Should support Loop protection and Loop detection, • Should support Ring protection (optional)		
11.	Access Control	• Support port security • Support 802.1x (Port based network access control). • Support for MAC filtering. • Should support TACACS+ and/or RADIUS authentication		
12.	VLAN	• Support 802.1Q Tagged VLAN and port based VLANs and Private VLAN • The switch must support dynamic		

#	Parameter	Minimum Specifications	Bidder Compliance (Yes/No)	Product Documentation Reference
		VLAN Registration or equivalent • Dynamic Trunking protocol or equivalent		
13.	Protocol and Traffic	• Network Time Protocol or equivalent Simple Network Time Protocol support • Switch should support traffic segmentation • Traffic classification should be based on user-definable application types: TOS, DSCP, Port based, TCP/UDP port number		
14.	Management	• Switch needs to have a console port for management via a console terminal or PC • Must have support SNMP v1,v2 and v3 • Should support 4 groups of RMON • Should have accessibility using Telnet, SSH, Console access, easier software upgrade through network using TFTP etc.		

#	Parameter	Minimum Specifications	Bidder Compliance (Yes/No)	Product Documentation Reference
		Configuration management through CLI, GUI based software utility and using web interface		
15.	Resiliency	• Dual load sharing AC and DC power supplies • Redundant variable-speed fans		

6.12.4. Server Load balancer

1. Server Load Balancing Mechanism
    a. Cyclic, Hash, Least numbers of users
    b. Weighted Cyclic, Least Amount of Traffic
    c. NT Algorithm / Private Algorithm / Customizable Algorithm / Response Time
2. Redundancy Features
    a. Supports Active-Active and Active-Standby Redundancy
    b. Segmentation / Virtualization support along with resource allocation per segment, dedicated access control for each segment
3. Routing Features
    a. Routing protocols RIPv1/RIPv2/OSPF
    b. Static Routing policy support
4. Server Load Balancing Features
    a. Server and Client process coexist
    b. UDP Stateless
    c. Service Failover
    d. Backup/Overflow
    e. Direct Server Return
    f. Client NAT
    g. Port Multiplexing-Virtual Ports to Real Ports Mapping
    h. DNS Load Balancing
5. Load Balancing Applications
    a. Application/ Web Server, MMS, RTSP, Streaming Media
    b. DNS, FTP- ACTIVE & PASSIVE, REXEC, RSH,
    c. LDAP, RADIUS
6. Content Intelligent SLB

7. HTTP Header Super Farm
8. URL-Based SLB
9. Browser Type Farm
    a. Support for Global Server Load Balancing
    b. Global Server Load Balancing Algorithms
    c. HTTP Redirection,
    d. HTTP
    e. DNS Redirection, RTSP Redirection
    f. DNS Fallback Redirection, HTTP Layer 7 Redirection
10. SLB should support below Management options
    a. Secure Web Based Management
    b. SSH
    c. TELNET
    d. SNMP v1, 2, 3 Based GUI
    e. Command Line
11. Shall support minimum four (4) virtual instances and shall be scalable to 16 instances on the same appliance.
12. Shall have minimum of 14 Gbps of system throughput per virtual instance to support multiple load balancing and security functions.
13. Shall have minimum of 8x10G SFP+ interfaces from day one.
14. Shall have security features like reverse-proxy firewall, sync-flood and denial of service attack protection from day one

6.12.5. Servers (As Building block, to establishing computing solution for sub-systems/solutions)

#	Parameter	Minimum Specifications	Bidder Compliance (Yes/No)	Product Documentation Reference
1.	**Make**		<to be provided by the bidder>	
2.	**Model**		<to be provided by the bidder>	
3.	Processor	Latest series/ generation of 64 bit x86 processor(s) with Ten or higher Cores Processor speed should be minimum 2.4 GHz Minimum 2 processors per each physical server		
4.	RAM	Minimum 32 GB Memory per physical server scalable upto 256 GB		

#	Parameter	Minimum Specifications	Bidder Compliance (Yes/No)	Product Documentation Reference
5.	Internal Storage	2 x 300 GB SAS (10k rpm) hot swap		
6.	Network interface	4 X 10GbE LAN ports for providing Ethernet connectivity Optional: 1 X Dual-port 16Gbps FC HBA (or FCoE) for providing FC connectivity		
7.	Power supply	Dual Redundant Power Supply		
8.	RAID support	As per requirement/solution		
9.	Operating System	Licensed version of 64 bit latest version of Linux/ Microsoft® Windows based Operating system)		
10.	Form Factor	Rack mountable		
11.	Virtualization	Shall support Industry standard virtualization hypervisor like Hyper-V, VMWARE, Oracle VM etc. In case the MSI proposes the solution to virtualization, then they should propose suitable associated management solution to meet or exceed the SLAs.		

6.12.6. Storage

The estimated Storage requirement for the ICCC project is as below:

#	Minimum Storage Requirement	TB
1	Primary Storage	450
2	Secondary Storage	1400
3	Back up Storage	450

	Total	**2300**

Note:

- Bidder is expected to carry out the storage requirement estimation and supply as per the solution proposed, if the estimation is more than above specified. They may also refer the bandwidth estimation and storage functional requirements as provided in this Volume.
- Bidder may supply the storage in modular manner during the implementation (i.e. initially to cater to Phase I cameras, then to further phases & then entire city requirement).

6.12.7. Storage Specifications

#	Parameter	Minimum Specifications	Bidder Compliance (Yes/No)	Product Documentation Reference
1.	**Make**	<to be provided by the bidder>		
2.	**Model**	<to be provided by the bidder>		
3.	Solution/ Type	• IP Based/iSCSI/FC/NFS/ CIFS • If bidder is offering FCoE based solution, corresponding ports must be present in server as well as storage controller.		
4.	Storage	• Storage Capacity should be as per Overall Solution Requirement (usable, after configuring in offered RAID configuration) • RAID solution offered must protect against double disc failure. • Disks should be preferably minimum of 1.2 TB capacity for SSD / SAS and 3 TB for		

#	Parameter	Minimum Specifications	Bidder Compliance (Yes/No)	Product Documentation Reference
		SATA/ NL-SAS (combination as per performance and SLA requirements of overall solution) • To store all types of data (Data, Voice, Images, Video, etc) • Proposed Storage System should be scalable (vertically/horizontally)		
5.	Hardware Platform	• Rack mounted form-factor • Modular design to support controllers and disk drives expansion		
6.	Controllers	• At least 2 Controllers in active/active mode • The controllers / Storage nodes should be upgradable seamlessly, without any disruptions / downtime to production workflow for performance, capacity enhancement and software / firmware upgrades.		
7.	RAID support	• Should support various RAID Levels		
8.	Cache	• Minimum 64 GB of useable cache across all controllers. If cache is provided in		

#	Parameter	Minimum Specifications	Bidder Compliance (Yes/No)	Product Documentation Reference
		additional hardware for the storage solution, then cache must be over and above 64 GB.		
9.	Redundancy and High Availability	• The Storage System should be able to protect the data against single point of failure with respect to hard disks, connectivity interfaces, fans and power supplies		
10.	Management software	• All the necessary software (GUI Based) to configure and manage the storage space, RAID configuration, logical drives allocation, snapshots etc. are to be provided for the entire system proposed. • Licenses for the storage management software should include disc capacity/count of the complete solution and any additional disks to be plugged in in the future, upto max capacity of the existing controller/units. • A single command console for entire storage system.		

#	Parameter	Minimum Specifications	Bidder Compliance (Yes/No)	Product Documentation Reference
		• Should also include storage performance monitoring and management software • Should provide the functionality of proactive monitoring of Disk drive and Storage system for all possible disk failures • Should be able to take "snapshots" of the stored data to another logical drive for backup purposes		
11.	Data Protection	The storage array must have complete cache protection mechanism either by de-staging data to disk or providing complete cache data protection with battery backup to meet the SLAs		

6.12.8. Secondary Storage

#	Parameter	Minimum Specifications	Bidder Compliance (Yes/No)	Product Documentation Reference
1	**Make**	<to be provided by the bidder>		
2	**Model**	<to be provided by the bidder>		
3	Solution/Type	• Secondary Storage (Archival/Backup) can be on any media such as Disks, Disk systems, etc. or its		

#	Parameter	Minimum Specifications	Bidder Compliance (Yes/No)	Product Documentation Reference
		combination along with all associate software. (so as to arrive at lower cost per TB) • Minimum **1900** TB usable as secondary storage • May or may not use de-duplication technology • Compatible with primary storage • Must use latest stable technology platform, with support available for next 5 years.		
4	Backup Size	To store data as required, to meet the archival requirement for different type of data/information • 23 days of storage for surveillance camera feeds • 83 days of storage for traffic enforcement systems • 275 days of storage for ATCS systems		
5	Hardware Platform	• Rack mounted, • Rack based Expansion shelves		
6	Software Platform	Must include backup/archive application portfolio required		
7	Retrieval time	Retrieval time for any data stored on secondary storage should be max. 4 hours for critical data & 8		

#	Parameter	Minimum Specifications	Bidder Compliance (Yes/No)	Product Documentation Reference
		hours for other data. This would be taken into account for SLA calculation. (Critical data means any data needing urgent attention by the Judicial System or by Police Dept. for investigation / terrorist treat perception).		

6.12.9. Fire proof enclosure

The overall design of the safe should be suitable for safe storage of computer diskettes, tapes, smart cards and similar devices and other magnetic media, paper documents, etc. the safe should have adequate fire protection.

#	Parameters	Minimum Specifications	Bidder Compliance (Yes/No)	Product Documentation Reference
1	**Make**		<to be provided by the bidder>	
2	**Model**		<to be provided by the bidder>	
3	Capacity	**300 Litres**		
4	Temperature to Withstand	1000° C for at least 1 hour		
5	Internal Temperature	30° C after exposure to high temperature For 1 hour		
6	Locking	2 IO-lever high security cylindrical / Electronic lock		

6.12.10. KVM Module

#	Parameters	Minimum Specifications	Bidder Compliance (Yes/No)	Product Documentation Reference
1.	**Make**		<to be provided by the bidder>	
2.	**Model**		<to be provided by the bidder>	
3.	KVM Requirement	Keyboard, Video Display Unit and Mouse Unit		

#	Parameters	Minimum Specifications	Bidder Compliance (Yes/No)	Product Documentation Reference
		(KVM) for the IT Infrastructure Management at Data Center		
4.	Form Factor	19" rack mountable		
5.	Ports	minimum 8 ports		
6.	Server Connections	USB or KVM over IP.		
7.	Auto-Scan	It should be capable to auto scan servers		
8.	Rack Access	It should support local user port for rack access		
9.	SNMP	The KVM switch should be SNMP enabled. It should be operable from remote locations		
10.	OS Support	It should support multiple operating system		
11.	Power Supply	It should have dual power with failover and built-in surge protection		
12.	Multi-User support	It should support multi-user access and collaboration		

6.12.11. Server/Networking rack specifications

#	Parameter	Minimum Specifications	Bidder Compliance (Yes/No)	Product Documentation Reference
1.	**Make**		<to be provided by the bidder>	
2.	**Model**		<to be provided by the bidder>	
3.	Type	• 19" 42U racks mounted on the floor		

#	Parameter	Minimum Specifications	Bidder Compliance (Yes/No)	Product Documentation Reference
		• Floor Standing Server Rack - 42U with Heavy Duty Extruded Aluminum Frame for rigidity. Top cover with FHU provision. Top & Bottom cover with cable entry gland plates. Heavy Duty Top and Bottom frame of MS. Two pairs of 19" mounting angles with 'U' marking. Depth support channels - 3 pairs with an overall weight carrying Capacity of 500Kgs. • All racks should have mounting hardware 2 Packs, Blanking Panel. • Stationery Shelf (2 sets per Rack) • All racks must be lockable on all sides with unique key for each rack • Racks should have Rear Cable Management channels, Roof and base cable access		
4.	Wire managers	Two vertical and four horizontal		
5.	Power Distribution Units	• 2 per rack • Power Distribution Unit - Vertically Mounted, 32AMPs with 25 Power Outputs. (20 Power outs of IEC 320 C13 Sockets & 5 Power outs of 5/15 Amp Sockets), Electronically controlled		

#	Parameter	Minimum Specifications	Bidder Compliance (Yes/No)	Product Documentation Reference
		circuits for Surge & Spike protection, LED readout for the total current being drawn from the channel, 32AMPS MCB, 5 KV AC isolated input to Ground & Output to Ground		
6.	Doors	• The racks must have steel (solid / grill / mesh) front / rear doors and side panels. Racks should NOT have glass doors / panels. • Front and Back doors should be perforated with at least 63% or higher perforations. • Both the front and rear doors should be designed with quick release hinges allowing for quick and easy detachment without the use of tools.		
7.	Fans and Fan Tray	• Fan 90CFM 230V AC, 4" dia (4 Nos. per Rack) • Fan Housing Unit 4 Fan Position (Top Mounted) (1 no. per Rack) - Monitored - Thermostat based - The Fans should switch on based on the Temperature within the rack. The temperature setting should be factory settable. This unit should also include - humidity & temperature sensor		

#	Parameter	Minimum Specifications	Bidder Compliance (Yes/No)	Product Documentation Reference
8.	Metal	Aluminum extruded profile		
9.	Side Panel	Detachable side panels (set of 2 per Rack)		

6.12.12. Database Licenses

Bidder needs to provide Licensed RDBMS, enterprise/full version as required for the proposed Surveillance System and following all standard industry norms for performance, data security, authentication and database shall be exportable in to XML.

6.12.13. Backup Software

1. The software shall be primarily used to back up the necessary and relevant video feeds from storage that are marked or flagged by the Police. The other data that would require backing up would include the various databases that shall be created for the surveillance system. Details of data that would be created are available in the table at section 'Data Requirements'
2. Scheduled unattended backup using policy-based management for all Server and OS platforms
3. The software should support on-line backup and restore of various applications and Databases
4. The backup software should be capable of having multiple back-up sessions simultaneously
5. The backup software should support different types of backup such as Full back up, Incremental back up, Differential back up, Selective back up, Point in Time back up and Progressive Incremental back up and snapshots
    - The backup software should support different types of user interface such as GUI, Web-based interface

6.12.14. Directory services

1. Should be compliant with LDAP v3
2. Support for integrated LDAP compliant directory services to record information for users and system resources
3. Should provide authentication mechanism across different client devices / PCs
4. Should provide support for Group policies and software restriction policies
5. Should support security features, such as Kerberos, Smart Cards, Public Key Infrastructure (PKI), etc.
6. Should provide support for X.500 naming standards

7. Should support that password reset capabilities for a given group or groups of users can be delegated to any nominated user
8. Should support that user account creation/deletion rights within a group or groups can be delegated to any nominated user
9. Should support directory services integrated DNS zones for ease of management and administration/replication.

6.12.15. Layer 3 Gigabit Manageable Switch

#	Parameter	Minimum Specifications	Bidder Compliance (Yes/No)	Product Documentation Reference
1.	**Make**		<to be provided by the bidder>	
2.	**Model**		<to be provided by the bidder>	
3.	Ports	• 24 or 48 (as per requirements) 10/100/1000 Base-TX Ethernet ports and extra 2 nos of 10G ports loaded with required SFP+ modules • All ports can auto-negotiate between 10Mbps/ 100Mbps/ 1000Mbps, half-duplex or full duplex and flow control for half-duplex ports.		
4.	Switch type	Layer 3		
5.	MAC	Support 32K MAC address.		
6.	Backplane	Switching fabric capacity should support non-blocking architecture back plane for numbers of ports of switch (as per network configuration to meet performance requirements)		
7.	Forwarding rate	Packet Forwarding Rate should be 70.0 Mpps or better		

#	Parameter	Minimum Specifications	Bidder Compliance (Yes/No)	Product Documentation Reference
8.	Port Features	Must support Port Mirroring, Port Trunking and 802.3ad LACP Link Aggregation port trunks		
9.	Flow Control	Support IEEE 802.3x flow control for full-duplex mode ports.		
10.	Protocols	• Support 802.1D, 802.1S, 802.1w, Rate limiting • Support 802.1Q VLAN encapsulation, IGMP v1, v2 and v3 snooping • 802.1p Priority Queues, port mirroring, DiffServ • Support based on 802.1p priority bits with at least 8 queues • DHCP support & DHCP snooping/relay/optional 82/ server support • Shaped Round Robin (SRR) or WRR scheduling support. • Support for Strict priority queuing & Sflow • Support for IPV6 ready features with dual stack,Support upto 255 VLANs and upto 4K VLAN IDs		
11.	Access Control	• Support port security • Support 802.1x (Port based network access control). • Support for MAC filtering.		

#	Parameter	Minimum Specifications	Bidder Compliance (Yes/No)	Product Documentation Reference
		• Should support TACACS+ and RADIUS authentication		
12.	VLAN	• Support 802.1Q Tagged VLAN and port based VLANs and Private VLAN • The switch must support dynamic VLAN Registration or equivalent • Dynamic Trunking protocol or equivalent		
13.	Protocol and Traffic	• Network Time Protocol or equivalent Simple Network Time Protocol support • Switch should support traffic segmentation • Traffic classification should be based on user-definable application types: TOS, DSCP, Port based, TCP/UDP port number		
14.	Management	• Switch needs to have console port for management via PC • Must have support SNMP v1,v2 and v3 • Should support 4 groups of RMON • Should have accessibility using Telnet, SSH, Console access, easier software upgrade through network using TFTP etc.		

#	Parameter	Minimum Specifications	Bidder Compliance (Yes/No)	Product Documentation Reference
		Configuration management through CLI, GUI based software utility and using web interface		

6.12.16. Structured Cabling Components

#	Parameter	Minimum Specifications	Bidder Compliance (Yes/No)
1.	Standards	ANSI TIA 568 C for all structured cabling components	
2.	OEM Warranty	OEM Certification and Warranty of 15-20 years as per OEM standards	
3.	Certification	UL Listed and Verified	

6.12.17. Electrical cabling component

#	Parameter	Minimum Specifications	Bidder Compliance (Yes/No)
1.	Standards	All electrical components shall be design manufactured and tested in accordance with relevant Indian standards IEC's	

6.13. Technical Specifications & Functional Specifications–Integrated Command and Control Centre (ICCC)

The functional requirements and technical specifications provided in the below sections and at other sections in this RFP are indicative and carry guiding rule. The MSI is free to offer products and solutions which meet requirements of the RFP focusing on the outcome, future scalability, security, reliability and adherence to specified SLA under this RFP, in line with applicable standards & best practices adopted in the industry. The MSI is encouraged to design an Optimised solution which is technically superior, innovative, proven, better in terms of functionality and is cost effective. Any specified parameters mentioned in the scope/technical requirement in the RFP may be considered if it is required for meeting current & future requirements during the contract period. The MSI is fully responsible for the specified outcome to be achieved.

6.13.1. Integrated Command and Control Center Application

#	Parameters	Minimum Specifications	Bidder Compliance	Product Documentation Reference
1.	**Make**		<to be provided by the bidder>	
2.	**Model**		<to be provided by the bidder>	
3.	Solution & Platform	The Command & Control solution should be implemented and complied to the industry open standards based Commercial-of-the-shelf (COTS) products.		
4.		Must have built-in fault tolerance, load balancing and high availability & must be certified by the OEM.		
5.		Software (Application, Database and any other) must not be restricted by the license terms of the OEM from scaling out on unlimited number of cores and servers during future expansion.		
6.		System must provide a comprehensive API (Application Program Interface) or SDK (Software Development's Kit) to allow interfacing and integration with existing systems, and future application and sensors which will be deployed on the field.		

#	Parameters	Minimum Specifications	Bidder Compliance	Product Documentation Reference
7.		The solution should be network and protocol agonistic and provide option to connect legacy system through API's with either read, write or both options. It should connect diverse on premise and/or cloud platform's and make it easy to exchange data and services between them.		
8.		The system shall allow seamless integration with all of the department's existing and future initiatives (as mentioned in Section 7.1.5)		
9.		The platform should be able to integrate with any type of sensor platform being used for the urban services irrespective of the technology used.		
10.		The platform should be able to normalize the data coming from different devices of same type (i.e. Different lighting sensor from different OEMs, different energy meters from different OEMs etc.) and provide secure access to that data using data API(s) to application developers		
11.	Convergence of Multiple feeds / services	System need to have provision that integrates various services and be able to monitor them and operate them. The solution should provide option to integrate existing deployed solution by City and also need to provide scalability option to implement new use cases. System should support DDE and OLE for integration with Process control systems and sensors		

#	Parameters	Minimum Specifications	Bidder Compliance	Product Documentation Reference
		System should have capability to source data from various systems implemented in Agartala City to create actionable intelligence		
12.	Industry Standards for the Command & Control Center	The solution should adhere to the Industry standards for interoperability, data representation & exchange, aggregation, virtualization and flexibility		
13.		IT Infrastructure Library (ITIL) standards for Standard Operations Plan & Resource Management		
14.		Geo Spatial Standards like GML & KML etc.		
15.		Business Process Model and Notation (BPMN) or equivalent for KPI Monitoring.		
16.	Command & Control Center Components	• Web server to manage client requests. Client should provide web-based, one-stop portals to event information, overall status, and details. The user interface (UI) to present customized information in various preconfigured views in common formats. All information to be displayed through easy-to-use dashboards.		
17.		• Application server to provide a set of services for accessing and visualizing data. Should be able to import data from disparate external sources, such as databases and files. It should provide the contacts and instant messaging service to enable effective, real-time communication. It should		

#	Parameters	Minimum Specifications	Bidder Compliance	Product Documentation Reference
		provide business monitoring service to monitor incoming data records to generate key performance indicators. It should also provide the users to view key performance indicators, standard operating procedures, notifications, and reports, spatial-temporal data on a geospatial map, or view specific details that represent a city road, building or an area either on a location map, or in a list view. The application server should provide security services that ensure only authorized users and groups can access data. • System Platform – The platform should provide a common data integration layer which can collect and contextualize information from disparate data sources regardless of protocol. The platform should support templatization to allow "build once-deploy everywhere" functionality. • Workflow and Incidents Lifecycle engine – This function should allow users to define and modify new worflows. The workflow could cut across multiple systems via the interfacing modules. Workflow for operational alerts and escalations should		

#	Parameters	Minimum Specifications	Bidder Compliance	Product Documentation Reference
		be triggered automatically without human intervention. Workflow approvals should have facility to approve from any device with e-signature. This function should provide facility to trigger a corrective action workflow and define the stakeholders for the same. Should manage the life cycle of incidents and related entities via pre-define workflows. The workflow could cut across multiple systems via the interfacing modules. Workflow for operational alerts and escalations should be triggered automatically without human intervention. • Incidents Planning – should manage the planning preparations of an incident including resource allocation, tasks management etc. • Analytics and MIS – should provide users with business analytics reporting and tools to organize, evaluate and efficiently perform day to day operations • Security & Roles – should manage roles definition for internal as well as external access • Centralized data archiving for operational data : Should provide facility for centralized storage of operational data (time-series or transactional)		

#	Parameters	Minimum Specifications	Bidder Compliance	Product Documentation Reference
		with high granularity and data compression capability • Mobility: should enable app-based access to monitor alerts, KPI ,KOPs, SOPs and reports to mobile users. Should support popularly user's smartphone /tablets. App content should be presented in context to the user role.		
18.	Incident Management Requirements	The system must provide Incident Management Services to facilitate the management of response and recovery operations:		
19.		Should support comprehensive reporting on event status in real time manually or automatically by a sensor/CCTV video feeds.		
20.		Should support for sudden critical events and linkage to standard operating procedures automatically without human intervention.		
21.		Should support for multiple incidents with both segregated and/or overlapping management and response teams.		
22.		Should support Geospatial rendering of event and incident information.		
23.		Should support plotting of area of impact using polynomial lines to divide the area into multiple zones on the GIS maps.		
24.		Should support incorporation of resource database for mobilizing the resources for response.		

#	Parameters	Minimum Specifications	Bidder Compliance	Product Documentation Reference
25.		Should provide facility to capture critical information such as location, name, status, time of the incident and be modifiable in real time by multiple authors with role associated permissions (read, write). Incidents should be captured in standard formats to facilitate incident correlation and reporting.		
26.		The system must identify and track status of critical infrastructure / resources and provide a status overview of facilities and systems		
27.		Should provide detailed reports and summary views to multiple users based on their roles.		
28.		A Reference Section in the tool must be provided for posting, updating and disseminating plans, procedures, checklists and other related information.		
29.		Provide User-defined forms as well as Standard Incident Command Forms for incident management.		
30.	Integrated User Specific & Customizable Dashboard	Should provide integrated dashboard with an easy to navigate user interface for managing profiles, groups, message templates, communications, tracking receipts and compliance		
31.		• Collects major information from other integrated City sensors/platforms. • Should allow different inputs beyond cameras, such as, PC screen, web page, and other external devices for rich screen layout • Multi-displays configurations		

#	Parameters	Minimum Specifications	Bidder Compliance	Product Documentation Reference
		• Use of, GIS tool which allows easy map editing for wide area monitoring (Google map, Bing map, ESRI Arc GIS map, etc.).		
32.		Should provide tools to assemble personalized dashboard views of information pertinent to incidents, emergencies & operations of command center		
33.		Should provide historical reports, event data & activity log. The reports can be exported to pdf or html formats.		
34.		Should provide dashboard filtering capabilities that enable end-users to dynamically filter the data in their dashboard based upon criteria, such as region, dates, product, brands, etc. and capability to drill down to the details		
35.	Integration with Social Media & Open Source Intelligence	Should provide integration of the Incident Management application with the social media. Should Provide analytics based on the social media feed collected from the open source intelligence and collate with the surveillance inputs to alert the responders for immediate action on the ground.		
36.		Should extract messages and display it in an operational dashboard.		
37.		Should be able to correlate the extracted message from the social media with existing other events and then should be able to initiate an SOP.		
38.		Should be able to identify the critical information and should be able to link it to an existing SOP or a new SOP should be started.		

#	Parameters	Minimum Specifications	Bidder Compliance	Product Documentation Reference
39.		Should provide notifications to multiple agencies and departments (on mobile) that a new intelligence has been gathered through open source/social media.		
40.	Device Status, Obstruction Detection and Availability Notification	Should provide icon based user interface on the GIS map to report non-functional device.		
41.		Should also provide a single tabular view to list all devices along with their availability status in real time.		
42.		Should provide User Interface to publish messages to multiple devices at the same time.		
43.	Event Correlation	Command & Control Center should be able to correlate two or more events coming from different subsystems (incoming sensors) based on time, place, custom attribute and provide correlation notifications to the operators based on predefined business and operational rules in the configurable and customizable rule engine.		
44.	Standard Operations Procedures (SOP)	Command & Control Center should provide for authoring and invoking un-limited number of configurable and customizable standard operating procedures through graphical, easy to use tooling interface.		
45.		Standard Operating Procedures should be established, approved sets of actions considered to be the best practices for responding to a situation or carrying out an operation.		
46.		The users should be able to edit the SOP, including adding, editing, or deleting the activities.		

#	Parameters	Minimum Specifications	Bidder Compliance	Product Documentation Reference
47.		The users should be able to also add comments to or stop the SOP (prior to completion).		
48.		There should be provision for automatically logging the actions, changes, and commentary for the SOP and its activities, so that an electronic record is available for after-action review.		
49.		The SOP Tool should have capability to define the following activity types:		
50.		**Manual Activity** - An activity that is done manually by the owner and provide details in the description field.		
51.		**Automation Activity** - An activity that initiates and tracks a particular work order and select a predefined work order from the list.		
52.		**If-Then-Else Activity** - A conditional activity that allows branching based on specific criteria. Either enter or select values for Then and Else.		
53.		**Notification Activity** - An activity that displays a notification window that contains an email template for the activity owner to complete, and then sends an email notification.		
54.		**SOP Activity** - An activity that launches another standard operating procedure.		
55.	Key Performance Indicator	Command & Control Center should be able to facilitate measurement or criteria to assay the condition or performance of departmental processes & policies.		

#	Parameters	Minimum Specifications	Bidder Compliance	Product Documentation Reference
56.		**Green** indicates that the status is acceptable, based on the parameters for that KPI, no action is required.		
57.		**Yellow** indicates that caution or monitoring is required, action may be required.		
58.		**Red** indicates that the status is critical and action is recommended.		
59.	Reporting Requirements	Command & Control Center should provide easy to use user interfaces for operators such as Click to Action, Charting, Hover and Pop Ups, KPIs, Event Filtering, Drill down capability, Event Capture and User Specific Setup		
60.		The solution should generate Customized reports based on the area, sensor type or periodic or any other customer reports as per choice of the administrators		
61.	Collaboration Tools	Should provide tools for users to collaborate & communicate in real-time using instant messaging features.		
62.	Communication Requirements	The solution should adhere to the below mentioned communication requirements.		
63.		Provide the ability to search/locate resources based on name, department, role, geography, skill etc. for rapidly assembling a team, across department, divisions and agency boundaries, during emergency		
64.		Provide the capability to Invite - Using information provided during the location of those individuals or roles, invite them to collaborate and to share valuable information.		

#	Parameters	Minimum Specifications	Bidder Compliance	Product Documentation Reference
65.		Provide a single web based dashboard to send notifications to target audiences using multiple communication methods including voice-based notification on PSTN/Cellular, SMS, Voice mail, E-mail and Social Media		
66.		The solution should provide Dispatch Console integrates with various communication channels. It should provide rich media support for incidents, giving dispatchers the power to consolidate information relating to an incident and instantly share that information among responder teams. It should assess the common operating picture, identify & dispatch mobile resources available nearby the incident location. Augment resources from multiple agencies for coordinated response.		
67.	Authentication	Use authentication information to authenticate individuals and/or assign roles.		
68.	Instant messaging	Provide ability to converse virtually through the exchange of text, audio, and/or video based information in real time with one or more individuals within the emergency management community.		
69.	Events and Directives control	Should provide the capability for the events that are produced from a sub-system and are forwarded to the Command & Control Center. Events could be a single system occurrence or complex events that are correlated from multiple systems. Events could be ad hoc, real-time, or predicted and		

#	Parameters	Minimum Specifications	Bidder Compliance	Product Documentation Reference
		could range in severity from informational to critical. At the Command & Control Center, the event should be displayed on an operations dashboard and analysed to determine a proper directive.		
70.		Directives issued by the Command & Control Center should depend on the severity of the monitored event. Directives will be designed and modified based on standard operating procedures, as well as state legislation. A directive could be issued automatically via rules, or it could be created by the operations team manually.		
71.	Resource & Route Optimization	The system should provide the software component for the message broadcast and notification solution that allows authorized personal and/or business processes to send large number of messages to target audience (select-call or global or activation of pre-programmed list) using multiple communication methods including SMS, Voice (PSTN/Cellular), Email and Social Media.		
72.	Alert & Mass Notification Requirements	Provide a single web based dashboard to send notifications to target audiences using multiple communication methods including voice-based notification on PSTN/Cellular, SMS, Pager, Voice mail, E-mail and Social Media		
73.		Provide function for creating the alert content and disseminating to end users. Provision of alerting external broadcasting organizations		

#	Parameters	Minimum Specifications	Bidder Compliance	Product Documentation Reference
		like Radio, TV, Cellular, etc., as web-service.		
74.		Provide Role based security model with Single-Sign-On to allow only authorized users to access and administer the alert and notification system.		
75.	Security & Access Control	Provide comprehensive protection of web content and applications on back-end application servers, by performing authentication, credential creation and authorization.		
76.	Internet Security	Comprehensive policy-based security administration to provide all users specific access based on user's responsibilities. Maintenance of authorization policy in a central repository for administration purposes.		
77.	Authorization	Should support to enable assignment of permissions to groups, and administration of access control across multiple applications and resources. Secure, web-based administration tools to manage users, groups, permissions and policies remotely		
78.	User group	Provide policies using separate dimensions of authorization criteria like Traditional static Access Control Lists that describe the principals (users and groups) access to resource and the permissions each of these principals possess.		

#	Parameters	Minimum Specifications	Bidder Compliance	Product Documentation Reference
79.	Provide multi-dimensional access control	SSO to Web-based applications that can span multiple sites or domains with a range of SSO options.		
80.	Flexible single sign-on (SSO)	Support LDAP authentication mechanism		
81.	Authentication	Should have ability to respond to real-time data with intelligent & automated decisions		
82.	Rule Engine & Optimization	Should provide an environment for designing, developing, and deploying business rule applications and event applications.		
83.		The ability to deal with change in operational systems is directly related to the decisions that operators are able to make		
84.		Should have at-least two complementary decision management strategies: business rules and event rules.		
85.	Situational Awareness COP (Common Operational Picture)	• The CCA should be able to combine data from various sources and present it as different views tailored to different operator's needs. • The CCA should automatically update the information based on alarms and incidents that are presented to it via the business rules engine. The polling and CCA database refresh cycle shall be configurable to match the status of the situation (whether there is an emergency or crisis or just monitoring only). • Common Operational Picture should comprise of a		

#	Parameters	Minimum Specifications	Bidder Compliance	Product Documentation Reference
		comprehensive view of the incident or a group of related incidents as on a specific date and time which should include but not be limited to the following: ○ Tasks assignment and their status ○ Agencies involved ○ Resources deployed ○ Incident status across relevant parameters of the incident e.g. household affected by a transformer shut down ○ Timeline view of the situation Suggested actions from the system with their status		
86.	Task Management	• The system should be able to create, assign, track and report on the lifecycle of tasks during a particular incident. • The system should allow a particular task to be decomposed into sub-tasks. • The system should provide an easy to interpret management dashboard view of the progress of all tasks during an incident. • The system should be able to organise the visual representation of tasks into prioritized list, filtered list, as well as colour coded representation for ease of understanding.		

#	Parameters	Minimum Specifications	Bidder Compliance	Product Documentation Reference

		• The system should be able to perform the following functions around task management:
		  ○ Create a task with unique ID. (Subtasks shall follow parent ID with second level numbering).
		  ○ Assign a target completion date and time for the task, either directly or as a time-span from the task's creation.
		  ○ Date and time stamp of the creation of the task.
		  ○ Log and track status of tasks. System should provide capability to define status of tasks during its lifecycle. These status definitions could be mapped to other task attributes such as the task type.
		  ○ Key-word search against task list.
		• The above attributes shall be colour coded.
		• The system shall allow the tasks to be filtered on the real-time dashboard by agency then by task status. This filtering should allow an operator to filter for all tasks of a particular state or a combination of state; and by the time remaining until (or time elapsed since) the target completion time.
		• The system should allow multiple individual workstations to select specific agencies of		

#	Parameters	Minimum Specifications	Bidder Compliance	Product Documentation Reference
		interest on each workstation simultaneously. • The system should allow the ASCL to display all agencies' tasks simultaneously as well. • The tasks should be displayed on a real-time timeline. **The criticality of tasks should be dynamically changed depending on the performance of the incident response.**		
87.	Timeline and Charting	• The system should provide a facility to see incidents and actions (tasks) added to the CCA in a tabular list form as well as GANTT chart format filtered by day, week, month, year or any specific date range. • The system should provide a facility to see incidents, actions and interdependencies between actions in a clear visual graphical manner. • The system should be able to filter the information based on at least the following parameters: o Incident information o Resources information o Agency type o Tasks o Criticality or priority		
88.	GIS Display	• Shall view the environment through geospatial or fixed composite computer-generated (JPEG, BMP, AutoCAD, etc.) map • Should allow user to view sensor and related name from the displayed map		

#	Parameters	Minimum Specifications	Bidder Compliance	Product Documentation Reference
		• Should allow all resources, objects, sensors and elements on the map to be geo-referenced such that they have a real world coordinate. • Should visually display a camera sensor with related camera orientation, camera range and camera field of view angle. • Should visually display an alarming sensor on map • Should visually differentiate sensor alarm severities on map through different color and icon identifiers • Should immediately view alarm details (including description, video, etc.) and investigate the alarm from the map • Should allow user to choose camera and other sensors from map to view live video and the data • Should allow user to choose camera and take live video image snapshot and save to file from any camera • Should allow user to choose camera from map to move PTZ cameras • Should allow user to choose camera to play, pause, stop, fast-forward, rewind, and play recorded video from preset time • Should allow user to choose camera and take recorded video image snapshot and save to file or		

#	Parameters	Minimum Specifications	Bidder Compliance	Product Documentation Reference
		print from any live or recorded video • Should allow user to jump from one map to the next with a single click of a mouse with map links • Should allow map information "layers" to be displayed/hidden on items such as – o Sensor names o Sensors o Sensor range (e,g. camera – orientation, range, field of view angle) o Locations and zones o Perimeter ranges o Resource tracks Allow user to zoom in/out on different regions of map graphic		
89.	Video Display	• Shall view live or recorded video from resizable and movable windows • Should have an ability to perform video controls for video systems from workstation • Shall play, fast-forward, rewind, pause, and specify time to play recorded video • Shall take a video still image (snapshot) from live or recorded video • Shall export video for user specified time and duration • Shall have the capability to move PTZ cameras • Shall view Video in Video Matrix • Shall display in 1x1, 2x2, 3x3 and 4x4 window formats		

#	Parameters	Minimum Specifications	Bidder Compliance	Product Documentation Reference
		• Shall enable operator to specify video windows to be displayed in matrix • Shall enable matrix settings to be saved per user • Shall view either live or recorded video can be displayed in the video matrix window. • Shall enable video snapshot to be taken and saved from any window pane in the matrix view • Shall rotate video in "virtual" video guard tour • Shall rotate through multiple video views based on predefined video camera sequence and duration. • Shall enable the user to pause the rotation of video and resume the video rotation again • Shall enable times between new video to be adjusted • Shall enable both live video and recorded video to be played through the video guard tour. • Shall enable alarms to be generated from any video pane • Shall enable user to only view and control video for which they have been assigned permissions by the administrator • Shall manually create an alarm from the live or recorded video with specified severity and description		
90.	Alarm Display	• Should have an ability to display alarm condition through visual display and audible tone		

#	Parameters	Minimum Specifications	Bidder Compliance	Product Documentation Reference
		• Should have an ability to simultaneously handle multiple alarms from multiple workstations • Should have an ability to automatically prioritize and display multiple alarms and status conditions according to pre-defined parameters such as alarm type, location, sensor, severity, etc. • Should display the highest priority alarm and associated data / video in the queue as default, regardless of the arrival sequence		
91.	Historical Alarm Handling	• Should have an ability to view historical alarms details even after the alarm has been acknowledged or closed. • Should have an ability to sort alarms according to date/time, severity, type, and sensor ID or location.		
92.	Alarm Reporting	• Should have an ability to generate a full incident report of the alarm being generated. • Should have an ability to display report on monitor and print report • Should have details of alarm including • severity, time/date, description and location • Captured video image snapshots • Relevant sensor data such as SCADA sensors • Response instructions		

#	Parameters	Minimum Specifications	Bidder Compliance	Product Documentation Reference
		• Alarm activities (audit trail) • Should have an ability to export alarm report in various formats including pdf, jpeg, html, txt, and mht formats • Should have an ability to generate an alarm incident package including the full incident report and exported sensor data from the incident in a specific folder location.		
93.	Alarm Policies and Business Logic Administration	• The CCA solution should have the following ability to handle the workflow alarms through graphical user interface. • Should have an ability to match keywords or text from the alarming subsystem's incident description to raise an alarm using criteria including exact match, exact NOT match, contains match, wildcard match and regularly expression match (such as forced door alarm, denied access, door open too long, etc.) • Should have an ability to optionally match alarming subsystem's incident status, incident severity, and sensor type • Should have an ability to apply any alarm policy to one or more monitoring area(s) or zone(s) without having to reapplying the policy multiple times. • Should have an ability to apply any alarm policy to one or more sensors without having to reapply the policy multiple times.		

#	Parameters	Minimum Specifications	Bidder Compliance	Product Documentation Reference
		• Should have an ability to assign specific actions for each alarm • Should have an ability to activate or deactivate alarms as required • Should have an ability to create exceptions • Should Create batch-wise rules and process them • Should Check and rectify logical errors and contradictory rules • Should have an ability to schedule execution of rules • • Should Suspend or Terminate the application of rule • Should archive unused or deactivated rules		

6.13.2. Contact Centre

#	Minimum Requirements	Bidder Compliance(Yes/No)	Product Documentation Reference
1	**Make**	<to be provided by the bidder>	
2	**Model**	<to be provided by the bidder>	
3	For upto 50 agents		
4	Automatic call distribution		
5	Automatic identification of incoming number based on landline and mobile number mapping		
6	Call recording mapped to incident tickets		
7	Customizable agent and supervisor desktop layout		
8	Inbound and outbound capability		
9	Call control		
10	Multisession web chat		
11	Email		
12	Live data reporting gadgets		
13	Phonebook		
14	Multiline support		
15	Speed dial in IP phones		

6.13.3. IP Push to Talk (interpretability Communication Channel)

#	Minimum Specifications	Bidder Compliance(Yes/No)	Product Documentation Reference
1	**Make**	<to be provided by the bidder>	
2	**Model**	<to be provided by the bidder>	
3	IP Push to Talk Radio: Instant communication to critical first responders via push to talk over IP. This will enable All communication across various business sites.		
4	The radio over IP solution must integrate any analog or digital radio system, any to any Push To Talk (PTTT) communications.		
5	The system shall create virtual talk groups (VTGs) to facilitate Push-to-Talk (PTT) communications between users of multiple types and technologies of Land Mobile Radios with users of PCs, landline phones, cellular and android phones, and IP phones.		
6	The system shall provide a High Availability option of adding a secondary hot standby server to provide high availability with no single point of failure. If a primary server fails, the secondary server automatically takes over service without communication interruption		
7	The solution must send encrypted data for PTT communications.		
8	The system shall provide a web service API to integrate System with third party applications, such as Command and Control		
9	The system shall support role-based management to provide compartmentalized functions for personnel who need to perform different roles.		
10	System should be capable to the system shall provide an easy-to-use Web interface. Authorized personnel shall be able to access the System Server from any location by using a supported browser and a network connection		
11	Integrate with IP phones to talk to radio walkie talkies / Any other compatible Phone		
12	The system shall provide Loop Prevention: As multiple dispatchers patch channels together, there		

#	Minimum Specifications	Bidder Compliance(Yes/No)	Product Documentation Reference
	is always the possibility of creating a channel loop that causes audio feedback into the communication path. The system should automatically identify potential audio loops and resolve them before they become an issue		
13	The System Server shall provide an audit trail for analysis, critique, and operations management. Detailed activity logging shall allow administrators to determine which user actions were performed and when they were performed		

6.13.4. Video Wall Screen

#	Parameter	Minimum Specifications	Bidder Compliance (Yes/No)	Product Documentation Reference
1.	**Make**	<to be provided by the bidder>		
2.	**Model**	<to be provided by the bidder>		
3.	Technology	HD LED Display, Direct LED Backlight		
4.	Screen Size	55''		
5.	Basel Size	1.2 mm (Top/Bottom), 2.3 mm (Left/right)		
6.	Resolution	Full high definition (1080p) 16:9 Widescreen		
7.	Contrast ratio	1400:1		
8.	Brightness	500 nit		
9.	Viewing angle	178 degree/178 degree (H/V)		
10.	Response time	12 ms		
11.	Input	HDMI and other inputs as per Video Wall solution offered		

#	Parameter	Minimum Specifications	Bidder Compliance (Yes/No)	Product Documentation Reference
12.	Control	- On Screen Display (OSD) - IR remote control		
13.	Operations	24 x 7		
14.	LED Lifespan	50000 hours (50% Brightness)		

6.13.5. Video Wall Controller

#	Parameter	Minimum Specifications	Bidder Compliance (Yes/No)	Product Documentation Reference
1.	Make	<to be provided by the bidder>		
2.	Model	<to be provided by the bidder>		
3.	Display controller	Controller to control Video wall in a matrix (4x2 output) as per requirement along with software		
4.	Processor	Latest Generation 64 bit x86 Quad Core processor (3.4 Ghz) or Better		
5.	RAM	16 GB DDR3 ECC RAM		
6.	HDD	2x500 GB 7200 RPM HDD (Configured in RAID 0)		
7.	RAID	Should support all RAID levels		
8.	Networking	Dual-port Gigabit Ethernet Controller with RJ-45 ports		
9.	Accessories	104 key Keyboard and Optical USB mouse		
10.	USB Ports	Minimum 4 USB Ports		
11.	OS	* Supports 64-bit Operating Systems Windows 7		

12.	Power Supply	(1+1) Redundant hot swappable		
13.	Chassis	19" Rack mount		
14.	Redundancy support	Power Supply, HDD, LAN port & Controller		
15.	Scalability	Display multiple source windows in any size, anywhere on the wall		
16.	Control functions	Brightness/ Contrast/ Saturation/ Hue/ Filtering/ Crop/ Rotate		
17.	System Reliability	Operating Temperature range : As per Agartala weather conditions Humidity: : As per Agartala weather conditions		
18.	Wall configuration	16 DVI-D Outputs		
19.	Universal Inputs	DVI/HDMI/USB/ LAN/ VGA/SATA port		
20.	Redundancy Support	Power Supply, HDD, LAN port & Controller		
21.	Video Wall, Controller, Cube & wall management	Video Wall, Controller, Cube & Wall management software should preferably be from same OEM for ensuring smooth operations and seamless integration and feature enablement and enhancement. All licenses of the software supplied with Controller and Video Wall should be with perpetual license and cost of the same should be included in the quoted cost.		

6.13.6. Video Wall Management Software

#	Parameter	Minimum Specifications	Bidder Compliance (Yes/No)	Product Documentation Reference
1	**Make**		<to be provided by the bidder>	
2	**Model**		<to be provided by the bidder>	
3	Display & Scaling	Display multiple sources anywhere on display up to any size		
4	Input Management	All input sources can be displayed on the video wall in freely resizable and movable windows		
5	Scenarios management	Save and Load desktop layouts from Local or remote machines		
6	Layout Management	Support all Layout from Input Sources, Internet Explorer, Desktop and Remote Desktop Application		
7	Multi View Option	Multiple view of portions or regions of Desktop, Multiple Application Can view from single desktop		
8	Other features	SMTP support		
9		Remote Control over LAN		
10		Alarm management		
11		Remote management		
12		Multiple concurrent client		
13		KVM support		
14	Cube Management	Cube Health Monitoring		
15		Pop-Up Alert Service		
16		Graphical User Interface		

Guidelines for Control Room Design and Setup

#	Parameter	Minimum Specifications or better
1.	Wall Size for Video Wall	Video-wall with Single Controller
2.	Cube Size	50 Inch Each for each operator
3.	Workstations	As per BOQ

General Requirements and Specifications for Console System

The following specifications detail the minimum requirements of the Console System. Bidders must respond on the enclosed chart. This allows for a point-by-point technical response stating compliance, taking exception or providing requested information. Bids submitted without this chart will be considered non-responsive.

Vendor shall supply the following to obtain project level approval

- Copy of ISO 9001:2008 Certification & ISO 14001:2004
- Copy of Green guard certifications for full console.
- Copy of FSC certification (Forest Stewardship Council) for Wood Components. Certificate for compliance towards sustainable forest initiative ensuring wood used is from sustainable forest harvesting.

The console(s) design shall be proven in service.

- The consoles shall be of modular design, facilitating future equipment retrofits and full reconfigurations without major modification to structure or exterior elements.
- The consoles shall have rigid independent frames.
- Mechanical fasteners shall connect adjacent modules to maintain perfect alignment.
- Depending upon the evolution of needs and technology, the construction shall provide easy and fast removal and installation of all equipment items.
- The console frame shall have the sit stand actuator mechanisms incorporated into the structural frame and these actuator mechanisms will not be free standing on the floor.
- The console frame shall have provisions for leveler legs to be incorporated into the frame. In addition, the frame will be pre-designed to install optional anti-vibration dampers (upon request) or anchoring brackets for applications where vibration is a factor or for applications located in seismic zones.
- The console frame structure shall have fully integrated cable management. The base structure will have a minimum of 2 lateral raceways; the transition from the base to the work surface will have a minimum of 2 vertical raceways; and the work surface will have a lateral raceway location depending on the size of equipment being mounted in the console.

- The cable raceways shall be continuous throughout the entire console layout thus allowing uninterrupted cable management.
- The console design shall be acoustically acceptable and minimize noise reflection.
- Consoles shall be properly finished to prevent glare and reflection.
- No sharp edges shall be present that may lead to injury to the operators.
- The color of the console shall be such that users can work for a long duration without eye strain or other stress.
- The console finish shall be resistant to rubbing and liquids, impact-proof and easy to clean.
- The surface of the work area shall be non-scratch able
- The work surface should be smooth and level and take into consideration all accepted human factor criteria, including view, reach distances, keyboard height and knee well space. The work surface height shall be adjustable.
- Full console sit to stand height adjustment shall be available via an electric actuator. The top section of the console raises both the upper viewable equipment and the work surface together.
- Detailed CAD (PDF format) drawings of console and equipment layouts for coordination of site measurements, architectural, mechanical, and electrical project elements for each console type will be provided.
- All Board Cladding (Laminates) must be 1MM & the Laminate supplier must be Green Guard Certified, Certificates of which must be provided on request
- Renderings of consoles and room must be provided on request.
- Pre-production review, to include a drawing submittal and component listing complete with samples of selected finish materials must be provided on request
- Samples of the following material components, which demonstrate workmanship, shall be provided upon request:
    - Work surface sample.
    - Sample panel construction and finish materials.

Modular Control Desk

- Bidder should refer the control desk design for any clarification of items.

Structure

- Console System must be of modular design. The Console design shall address the functional, ergonomic and aesthetic requirements of the particular working environment while complying with accepted human factor design and ergonomic standards for viewing distance, angle, keyboard height, and knee space requirements.

- Standard top height of modular control desk shall be 750 mm in sitting position and have to go till 1100 mm for Standing Position. The Console Table Top / Working Surface should be made in 12mm mm Solid Acrylic Panel (ASS) Cladded on 25mm MDF Board. Drawing is enclosed.
- Size of modular control desk shall be as per drawing and it should have arrangement for placing of 2 workstations monitor for 2 Users on each control desk.
- The Basic Structure should consist of Extruded AL Profiles (6063T6 grade) binded by Top & Bottom (min 2mm) MS Frames formed in such a way as to provide maximum buckling and torsion resistance. The Front & Back Panels should be openable / removable (with Locks) made of laminated MDF Board in min thickness of 18mm. The front Shutter will be of Toughed Glass (min. 4mm Thick) cladded on 18 mm MDF and back shutter in 18 mm MDF Boards with Fan for Heat decapitation.
- The Side Panels should be fixed type, made in 26mm MDF Board Cladded on 18mm MDF Board. All panels must be attached to the frame with concealed fasteners. Console access panels (Front & Rear Panels) must be removable without the use of tools. The Front panel should be positioned in such a way that there should be sufficient leg space (min of 400mm from the front edge of the Table Top).
- All sheet metal / aluminum parts must be finished with electrostatic powder coating with average of min 80 microns over all surfaces.
- Console frame shall have provisions for leveler legs to be incorporated into the frame.

Work Surface

- Console Table Top should be made of 12mm Solid Acrylic Panel (ASS) over 25mm MDF Board, with no sharp Edges. The work surface platform shall have smooth edges and transitions, thus avoiding sharp corners or potential rib catchers for operator safety.

Modular Rear Wall (Slat Wall)

- Wall should be of min 86 mm (Height) and approx. 200-300 mm high from the Monitor Base.
- Modular walls shall be made of 2mm thick Extruded Aluminum (6063T6 aluminum alloy).
- It should have high Load bearing capacity. Minimum weight carrying capacity has to be 20 KGs per Meter.

Monitor Arms

- It shall be capable for mounting all type of existing LCD monitor with dimensions between 17" to 27" using suitable adopter/additional base plate, if required any.
- or shall provide the suitable adopter/additional base plate for mounting the existing LCD monitors.
- It shall allow the rotate/ tilt/ raise/the monitors as well as fix their adjustment.
- The monitor arm should be Articulating monitor arm

Miscellaneous

- There shall be a closed cabinet (02 no in one Modular Control Desk) below the modular control desk for placing of CPU. Cabinet should have proper cooling system. CPU needs to be accessible from front as well as rear side of control desk for easy working and maintenance.
- The cabinet shutters shall be of Butt Hinged type with 18mm thick MDF.
- Rear shutters of each console should have provision of Airflow opening for cooling and heat dissipation effect.
- Rear panel shall have ventilation fans mounted on it.
- It shall have proper arrangement for flow of cables i.e. LAN Cable, Power cable, VGA cable, Mouse cable, Keyboard etc.
- Design of control desk shall allow cables from the floor cable channel.
- Control desk shall be equipped with individual power distribution unit (PDU) (06 no for one Modular Control Desk) and capable of being switched on/off individually. Power supply socket should be dual type i.e. Universal type.
- All bolts must be of SS material to avoid rust due to environment.

6.13.7. Monitoring Workstations

#	Parameter	Minimum Specifications	Bidder Compliance (Yes/No)	Product Documentation Reference
1.	**Make**		<to be provided by the bidder>	
2.	**Model**		<to be provided by the bidder>	
3.	Processor	Latest generation 64bit X86 Quad core processor(3Ghz) or better		
4.	Chipset	Latest series 64bit Chipset		
5.	Motherboard	OEM Motherboard		
6.	RAM	Minimum 8 GB DDR3 ECC Memory @ 1600 Mhz. Slots should be free for future upgrade. Minimum 4 DIMM slots, supporting up to 32GB ECC		
7.	Graphics card	Minimum Graphics card with 2 GB video memory (non-shared)		
8.	HDD	1 TB SATA-3 Hard drive @7200 rpm with Flash Cache of 64GB SSD		
9.	Media Drive	NO CD / DVD Drive		
10.	Network interface	10/100/1000 Mbps autosensing on board integrated RJ-45 Ethernet port.		
11.	Audio	Line/Mic IN, Line-out/Spr Out (3.5 mm)		

#	Parameter	Minimum Specifications	Bidder Compliance (Yes/No)	Product Documentation Reference
12.	Ports	Minimum 6 USB ports (out of that 2 in front)		
13.	Keyboard	104 keys minimum OEM keyboard		
14.	Mouse	2 button optical scroll mouse (USB)		
15.	PTZ joystick controller (with 2 of the workstations in SCOC)	• PTZ speed dome control for IP cameras • Minimum 10 programmable buttons • Multi-camera operations • Compatible with all the camera models offered in the solution • Compatible with VMS /Monitoring software offered		
16.	Monitor	Three Monitors of 22" TFT LED monitor, Minimum 1920 x 1080 resolution, 5 ms or better response time, TCO 05 (or higher) certified. The TFT Monitor, CPU, Mouse and keyboard workstation shall be of same make.		
17.	Certification	Energy star 5.0/BEE star certified		
18.	Operating System	64 bit pre-loaded OS with recovery disc		

#	Parameter	Minimum Specifications	Bidder Compliance (Yes/No)	Product Documentation Reference
19.	Security	BIOS controlled electro-mechanical internal chassis lock for the system.		
20.	Antivirus feature	Advanced antivirus, antispyware, desktop firewall, intrusion prevention (comprising of a single, deployable agent) which can be managed by a central server. (Support, updates, patches and errata for the entire contract/ project period)		
21.	**Power supply**	SMPS; Minimum 400-watt Continuous Power Supply with Full ranging input and APFC. Power supply should be 90% efficient with EPEAT Gold certification for the system.		

6.13.8. LED Display

#	Parameter	Minimum Specifications	Bidder Compliance (Yes/No)	Product Documentation Reference
1.	**Make**	<to be provided by the bidder>		
2.	**Model**	<to be provided by the bidder>		
3.	Technology	HD LED Display , Direct LED Backlight		

4.	Screen Size	55 inch diagonal or better for viewing centers		
5.	Resolution	Full high definition (Min 1920 x 1080) 16:9 Widescreen		
6.	Contrast ratio	5000:1		
7.	Brightness	350 nit		
8.	Viewing angle	178 degree/178 degree (H/V)		
9.	Response time	8ms		
10.	Control	- RS232 control - On Screen Display (OSD) - IR remote control		
11.	Operations	24x7		
12.	Additional Specifications	Should be at least UL / FCC, BIS, BEE/Energy Star certified		

6.13.9. IP Phones

#	Parameter	Minimum Specifications	Bidder Compliance (Yes/No)	Product Documentation Reference
1	**Make**		<to be provided by the bidder>	
2	**Model**		<to be provided by the bidder>	
3	Display	2 line or more, Monochrome display for viewing features like messages, directory		
4	Integral switch	10/100 mbps for a direct connection to a 10/100BASE-T Ethernet network through an RJ-45 interface		
5	Speaker Phone	Yes		

#	Parameter	Minimum Specifications	Bidder Compliance (Yes/No)	Product Documentation Reference
6	Headset	Wired, Cushion Padded Dual Ear-Speaker, Noise Cancelling headset with mouthpiece microphone, port compatibility with IP Phone		
7	VoIP Protocol	SIP V2		
8	POE	IEEE 802.3af or better and AC Power Adpater (Option)		
9	Supported Protocols	SNMP, DHCP, DNS		
10	Codecs	G.711, G.722, G.729 including handset and speakerphone		
11	Speaker Phone	Full duplex speaker phone with echo cancellation Speaker on/off button, microphone mute		
12	Volume control	Easy decibel level adjustment for speaker phone, handset and ringer		
13	Phonebook/ Address book	Minimum 100 contacts		
14	Call Logs	Access to missed, received, and placed calls. (Minimum 20 overall)		
15	Clock	Time and Date on display		
16	Ringer	Selectable Ringer tone		
17	Directory Access	LDAP standard directory		
18	QoS	QoS mechanism through 802.1p/q		

6.13.10. Network Color Laser printer

#	Parameter	Minimum Specifications	Bidder Compliance (Yes/No)	Product Documentation Reference
1.	**Make**		<to be provided by the bidder>	
2.	**Model**		<to be provided by the bidder>	
3.	Print Speed	Black : 16 ppm or above on A3, 24 ppm or above on A4 Color : 8 ppm or above on A3, 12 ppm or above on A4		
4.	Resolution	600 X 600 DPI		
5.	Memory	8 MB or more		
6.	Paper Size	A3, A4, Legal, Letter, Executive, custom sizes		
7.	Paper Capacity	250 sheets or above on standard input tray, 100 Sheet or above on Output Tray		
8.	Duty Cycle	25,000 sheets or better per month		
9.	OS Support	Linux, Windows 2000, Vista, 7, 8, 8.1		
10.	Interface	Ethernet Interface		

6.13.11. IP PBX (Call Control System)

#	Minimum Specifications	Bidder Compliance (Yes/No)	Product Documentation Reference
1.	**Make**	<to be provided by the bidder>	
2.	**Model**	<to be provided by the bidder>	
3.	The IP telephony system should be a converged communication System with ability to run analog and IP on the same platform using same		

#	Minimum Specifications	Bidder Compliance (Yes/No)	Product Documentation Reference
	software load based on server and Gateway architecture		
4.	The single IP PBX system should be scalable to support up to 500 stations (any mix/percentage of Analog/IP) to achieve the future capacity		
5.	The system should be based on server gateway architecture with external server running on Linux OS. No card based processor systems should be quoted		
6.	The voice network architecture and call control functionality should be based on SIP		
7.	The call control system should be fully redundant solution with no single point of failure & should provide 1:1 redundancy.		
8.	The communication server and gateway should support IP V6 from day one so as to be future proof		
9.	The entire solution (IP PBX, its hardware, IP Phones, Voice Gateway) should preferably be from a single OEM		
	Support for call-processing and call-control		
10.	Should support signaling standards/Protocols – SIP, MGCP, H.323, Q.Sig		
11.	Voice Codec support - G.711, G.729, G.729ab, g.722, ILBC		
12.	The System should have GUI support web based management console		
	Security		
13.	The protection of signaling connections over IP by means of authentication, Integrity and encryption should be carried out using TLS		
14.	System should support MLPP feature		
15.	Proposed system should support SRTP for media encryption and signaling encryption by TLS		
16.	Secure HTTP support for Call Server Administration, Serviceability, User Pages, and		

#	Minimum Specifications	Bidder Compliance (Yes/No)	Product Documentation Reference
	Call Detail Record Analysis and Reporting Tool. Should support Secure Sockets Layer (SSL) for directory		
17.	The administrator logging on to the call control server needs to authenticate by suitable mechanism such as User Login Information and Passwords/ Radius Server		
18.	Voice gateway to be provided with 1 PRI card scalable to 3 PRI in future for PSTN (PRI) line termination.		

6.13.12. Contact Centre Specifications

Automatic Call Distribution (ACD):

1) Should be highly available with hot standby and seamless failover in case of main server failure. There should not be any downtime of Contact Center in case of single server failure.
2) Should support skill based routing and it should be possible to put all the agents in to a single skill group and different skill groups
3) ACD support routing of incoming calls based upon caller input to menus, real-time queue statistics, time of day, day of week, ANI, dialed number etc.
4) ACD should support call routing based on longest available agent, circular agent selection algorithms.
5) ACD should support the playing of customizable queuing announcements based upon the skill group that the call is being queued to, including announcements related to position in queue and expected delay.
6) Agents should be able to chat with other Agents or supervisor from the Agent desktop software
7) Supervisor should be able to see the real-time status of agents, supervisors should be able to make agent ready or logout from the supervisor desktop
8) Should support Queuing of calls and playing different prompts depending on the type of call and time in the queue.
9) In future if required, the ACD should support active and standby server mode, where the server can be put in DC and DR. In case of Main server in the Data center fail the standby server in DR should take over seamlessly. ACD solution should support placing of Main and Stand by server in DC and DR respectively.

Interactive Voice Response (IVR):

1) IVR should play welcome messages to callers Prompts to press and collect DTMF digits
2) IVR should be able to integrate with backend database for self-service, as and when required.
3) GUI based tool to be provided for designing the IVR and ACD call flow.
4) IVR should support VoiceXML for ASR, TTS, and DTMF call flows
5) IVR should be able to Read data from HTTP and XML Pages
6) IVR should be able to run outbound campaigns.

Reporting:

1) System to provide report of IVR Application Performance Analysis, Call by Call details for all the calls, Traffic analysis reports etc
2) Reporting platform to support Agent level reports, Agent login, logout report, report on agent state changes
3) Queue reports, Abandon call reports all the reports should be summary, tabular and detailed report format to be available for the agents.
4) Reporting platform to support custom reports using a combination of the Crystal Reports Developer's Toolkit and SQL stored procedures.
5) Users of the Historical Reports should be able to perform the following functions View, print, and save reports. Sort and filter reports, Send scheduled reports to a file or to a printer. Export reports in a variety of formats, including PDF, RTF, XML, and CSV.

E-mail:

1) Administrator should be able to assign one or more email addresses to a single Queue.
2) Email routing support integration with Microsoft Exchange 2003 or Microsoft Exchange 2007 or 2010.
3) Agents should be able to automatically resume of e-mail processing on voice disconnect.
4) Agent should be able to save email draft response and resume at a later time.
5) Agent should be able to re-queue email.
6) Supervisor should be able to access real-time reporting for Agent E-Mail mail volume by Queue

6.13.13. Video Conferencing Unit

1) Video Standards: H.263, H.264
2) Should support 30 fps & 60fps (frames per second) with 1080p resolution from day one

3) Video Features: Ability to send and receive two live simultaneous video sources in a single call, so that the image from the main camera and PC or document camera can be seen simultaneously

4) Should support H.239 and BFCP protocols with 1080p resolution

5) Video Output: Should have at least 2 HDMI / DVI (High Definition Multimedia Interface) output to connect Full High Definition display devices such as LCD / LED and projectors for both Video and Content. (Dual Monitor Support)

6) It should be possible to display the main video on one HD screen and the presentation / dual video on the other HD screen.

7) Video Input: Should have at least one HD video Input to connect HD camera with full functionalities as mentioned in the camera specifications.

8) Should have DVI (Digital Video Interface) input to connect PC / Laptop directly to the Video conferencing system and display resolutions WXGA / HD720p along with PC Audio.

9) Audio standards: G.711, G.722, G.722.1, 64 kbps MPEG-4 AAC-LD or equivalent standards must be supported.

10) Audio Inputs: Should support minimum 2 Microphone inputs. 1 needs to be supplied from day one.

11) 1 LAN / Ethernet - 10/100/1000 Mbps

12) IP - at least 6 Mbps bandwidth support

13) Security: Password protected system menu

14) ITU-T standards based Encryption of the video call

15) Camera: Minimum of 12X Optical zoom

16) 1920 x 1080 pixels progressive @ 30fps

17) Should have at least 70 degrees field of view (horizontal)

18) The Camera and codec should be from the same manufacturer

6.13.14. Multiparty Conference Unit (Video and Audio Conferencing Bridge with Secure VC over Internet)

1) The Bridging should be running on the standard Intel servers on standard Virtualized platforms. The hardware, software and virtualization software should be supplied and supported by a single bidder.

2) From day one the bridge must provide 6 full HD video ports @1080p 30 fps and 30 audio conference ports.

3) All necessary hardware to support the above capacity needs to be supplied from day one. Bridge must have a redundant power supply.

4) All the 10 ports must be able to connect different sites at different bandwidths and protocols. H.264 AVC standard must be supported at the minimum to connect all the 10 sites.

5) The bridge should support room based video end points, users joining from browsers' supporting WebRTC and HTML5 and its own clients. In case additional components are required for this functionality, all additional components required to have this functionality has to be included in the solution

6) The bridge should have the capability to host meetings with internal and external participants in a secure way such that it should co-exist with the enterprise security policies

7) The bridge should have components such as the Web Server for Web RTC, Scheduler as part of the offering from day one.

8) Should support H.263, H.263+, H.263++, H.264, WebRTC video algorithms

9) Should support video resolution from SD to Full HD to join into a conference

10) Along with the Support for basic algorithms like G.711 and G.722.1 the bridge should also support wideband Audio protocols like MPEG 4 AAC - LC / MPEG 4 AAC – LD

11) Must support the ability to allow Video conferencing devices, Clients on Mobile phones, Smart phones and Laptops to join into conference. These clients can be inside the WAN network or even on the Internet without a VPN.

12) The bridge should support transcoding of different Audio/video Protocols.

13) The bridge should have H.239/BFCP protocol for sending and receiving dual video streams (Presenter + Presentation).

14) The bridge must also support advanced continuous presence such that the site that is "on-air" to be seen on a larger window and the other sites are seen in smaller quadrants

15) The bridge must be a secure Non-PC Hardware with a strong operating system. The Hardware and software must be from the same OEM.

16) The bridge should support 128 Bit strong AES encryption for calls and H.235/SHA1 for authentication

17) It should be possible for outside agencies (for state government, central government, police department, etc.) to join the bridge for multi-party video conference call securely over internet.

18) They should be able to join the bridge using standards based VC endpoints using internet (as long as these endpoints are exposed to internet) securely.

19) It should be possible to connect 5 such external endpoints / locations concurrently at any given point of time.

20) It should use secure firewall traversal technology.

21) It should support any standards-compliant SIP or H.323 video conferencing endpoints.

22) It should support for H.323 SIP Interworking Encryption and H.323 SIP Interworking DuoVideo

23) It should use standards based firewall traversal methods - H.460.18/19

6.13.15. Online UPS

#	Parameter	Minimum Specifications	Bidder Compliance (Yes/No)	Product Documentation Reference
1.	**Make**		<to be provided by the bidder>	
2.	**Model**		<to be provided by the bidder>	
3.	Capacity	Adequate capacity to cover all above IT Components at respective location		
4.	Output Wave Form	Pure Sine wave		
5.	Input Power Factor at Full Load	>0.90		
6.	Input	Three Phase 3 Wire for over 5 KVA		
7.	Input Voltage Range	305-475VAC at Full Load		
8.	Input Frequency	50Hz +/- 3 Hz		
9.	Output Voltage	400V AC, Three Phase for over 5 KVA UPS		
10.	Output Frequency	50Hz+/- 0.5% (Free running); +/- 3% (Sync. Mode)		
11.	Inverter efficiency	>90%		
12.	Over All AC-AC Efficiency	>85%		
13.	UPS shutdown	UPS should shutdown with an alarm and indication on following		

#	Parameter	Minimum Specifications	Bidder Compliance (Yes/No)	Product Documentation Reference
		conditions 1)Output over voltage 2)Output under voltage 3)Battery low 4)Inverter overload 5)Over temperature 6)Output short		
14.	Battery Backup	60 minutes in full load		
15.	Battery	VRLA (Valve Regulated Lead Acid) SMF (Sealed Maintenance Free) Battery		
16.	Indicators & Metering	Indicators for AC Mains, Load on Battery, Fault, Load Level, Battery Low Warning, Inverter On, UPS on Bypass, Overload, etc. Metering for Input Voltage, Output Voltage and frequency, battery voltage, output current etc.		
17.	Audio Alarm	Battery low, Mains Failure, Over temperature, Inverter overload, Fault etc.		
18.	Cabinet	Rack / Tower type		

#	Parameter	Minimum Specifications	Bidder Compliance (Yes/No)	Product Documentation Reference
19.	**Operating Temp**	As per Agartala weather conditions		

6.13.16. Fixed Dome camera for Indoor Surveillance

#	Parameter	Minimum Specifications or better	Bidder Compliance (Yes/No)	Product Documentation Reference
1.	**Make**		<to be provided by the bidder>	
2.	**Model**		<to be provided by the bidder>	
3.	Video Compression	H.264		
4.	Video Resolution	1920 X 1080		
5.	Frame rate	Min. 25 fps		
6.	Image Sensor	1/3" Progressive Scan CCD / CMOS		
7.	Lens Type	Varifocal, IR Correction Full HD lens compatible to camera imager		
8.	Lens#	Auto IRIS 2.8-10mm		
9.	Multiple Streams	Dual streaming with 2nd stream at minimum 720P at 30fps at H.264 individually configurable		
10.	Minimum Illumination	Colour: 0.1 lux, B/W: 0.01 lux (at 30 IRE)		
11.	IR Cut Filter	Automatically Removable IR-cut filter		

#	Parameter	Minimum Specifications or better	Bidder Compliance (Yes/No)	Product Documentation Reference
12.	Day/Night Mode	Colour, Mono, Auto		
13.	S/N Ratio	≥ 50 dB		
14.	Auto adjustment + Remote Control of Image settings	Colour, brightness, sharpness, contrast, white balance, exposure control, backlight compensation, Gain Control, Auto back focus		
15.	Wide Dynamic Range	True WDR upto 80 db		
16.	Audio	Full duplex, line in and line out, G.711, G.726		
17.	Local storage	Minimum 32 GB Memory card in a Memory card slot. In the event of failure of connectivity to the central server the camera shall record video locally on the SD card automatically. After the connectivity is restored these recordings shall be automatically merged with the server recording such that no manual intervention is required to		

#	Parameter	Minimum Specifications or better	Bidder Compliance (Yes/No)	Product Documentation Reference
		transfer the SD card based recordings to server.		
18.	Protocol	HTTP, HTTPS, FTP, RTSP, RTP, TCP, UDP, RTCP, DHCP, ONVIF Profile S &G		
19.	Security	Password Protection, IP Address filtering, User Access Log, HTTPS encryption		
20.	Intelligent Video	Motion Detection & Tampering alert		
21.	Alarm I/O	Minimum 1 Input & Output contact for 3rd part interface		
22.	Operating conditions	As per Agartala City conditions		
23.	Casing	NEMA 4X / IP-66 rated & IK 10		
24.	Certification	UL/EN, CE,FCC		
25.	Power	802.3af PoE (Class 0) and 12VDC/24AC		

6.14. Non-IT Requirements & Specifications

The functional requirements and technical specifications provided in the below sections and at other sections in this RFP are indicative and carry guiding rule. The MSI is free to offer products and solutions which meet requirements of the RFP focusing on the outcome, future scalability, security, reliability and adherence to specified SLA under this RFP, in line with applicable standards & best practices adopted in the industry. The MSI is encouraged to design an Optimised solution which is technically superior, innovative, proven, better in terms of functionality and is cost effective. Any specified parameters mentioned in the scope/technical requirement in the RFP may be considered if

it is required for meeting current & future requirements during the contract period. The MSI is fully responsible for the specified outcome to be achieved. It is essential that Fire Proof material be used as far as possible and Certification from Fire Department be taken for Command Centres before Go-Live.

6.14.1. Civil and Architectural Work

#	Description	Bidder Compliance (Yes/No)
A.	**False Ceiling (at Command Centers)**	
1	Providing and fixing metal false ceiling with powder coated 0.5mm thick hot dipped galvanised steel tiles 595 x 595 mm with regular edge (10mm) suitable for 25mm grid supported on suitable powder coated galvanised steel grid as per manufacturer specification. The same shall be inclusive of cut outs for lighting, AC grills, Fire detectors, nozzles, etc.	
2	Providing and fixing 12 mm thick fire line Gypsum false ceiling and lighting troughs 300 mm as per design including 100 mm high cornices as lighting pelmets on G.I. frame work, in G.I. vertical supports at every 450mm c/c and horizontal runners at every 900mm c/c self-taping metal screws to proper line and level. The same shall be inclusive of making holes and required framing for fixing electrical fixtures, A.C. grills etc. GI vertical supports to be anchored to slab by means of anchor fasteners.	
B.	**Furniture and Fixture**	
1	Workstation size of min. 18” depth made with 1.5mm thick laminate of standard make over 18mm thick commercial board complete with wooden beading including cutting holes & fixing of cable manager etc. complete with French polish. Edges shall be factory post-formed. The desk shall have the necessary drawers, keyboard trays, cabinets etc. along with sliding / opening as per approved design with quality drawer slides, hinges, locks etc.	
2	Providing & making of storage unit with 18 mm thick MDF board along with 1.5 mm approved laminate colour outside and 2 coat of enamel paint inside the storage of size 1'6"x1'6"x2'4". The same should be provided with all the required accessories including the handle, lock, sliding channel and necessary hardware, etc. complete with French polish	

#	Description	Bidder Compliance (Yes/No)
3	Cabin table of min. depth 2' made with 1.5mm thick laminate of standard make over 19mm thick commercial board complete with wooden beading including cutting holes & fixing of cable manager etc. complete with French polish.	
4	Providing, making & fixing 6" high laminated strip using 1.5mm thick laminate over 10mm thick commercial board on all vertical surface in the entire server & ancillary areas including low height partition, brick wall, partition wall, cladding etc. complete with French polish in all respect.	
5	Providing, making & fixing an enclosure for gas cylinder of Shutters and Partitions along with wooden support and 18 mm thick MDF board along with 1.5 mm approved laminate colour outside and 2 coat of enamel paint inside the shutter. The same should be provided with all the required accessories including the handle, lock, loaded hinges, tower bolt and necessary hardware etc. complete with French polish.	
C.	**Partitions** (wherever required as per approved drawing)	
1	Providing and fixing in position full height partition wall of 125 mm thick fire line gyp-board partition using 12.5 mm thick double fire line gyp-board on both sides with GI steel metal vertical stud frame of size 75 mm fixed in the floor and ceiling channels of 75 mm wide to provide a strong partition. Glass wool insulation inside shall be provided as required. Fixing is by self-tapping screw with vertical studs being at 610 mm intervals. The same should be inclusive of making cut-outs for switch board, sockets, grill etc. It shall also include preparing the surface smoothly and all as per manufacture's specification etc. finally finishing with one coat of approved brand of fire resistant coating.	
2	With glazing including the framework of 4" x 2" powder coated aluminium section complete (in areas like partition between server room & other auxiliary areas).	
3	Providing & fixing Fire Rated Wire Glass minimum 6 mm thick for all glazing in the partition wall complete. (External windows not included in this).	

#	Description	Bidder Compliance (Yes/No)
4	All doors should be minimum 1200 mm (4 ft.) wide.	
D.	**Flooring** (wherever required as per approved drawing)	
1	The MSI shall procure and install a raised floor to match the floor height and room aesthetic in accordance with the approved final layout and design. The MSI shall consider standard parameters for developing the final height, width, point of load, and uniform distribution load of the raised floor for the rooms based on type of furniture and overall load.	
2	The MSI shall ensure the following features and parameters are considered while designing and commissioning the raised floor: 1. Point of Load (PoL) shall be considered 20% more than the actual load 2. Uniform Distribution Load shall be calculated according to the final Point of Load 3. Noise-proof 4. Fireproof 5. Maintenance window for easy access to under the raised floor 6. Separate electrical and data cable tray under the raised floor 7. Face of floor tiles shall conform to the aesthetic part of the approved design	
3	The MSI shall perform load test and noise test of the constructed raised floor.	
4	The MSI shall complete the following requirements for the raised flooring panels: 1. Floor shall be designed for standard load conforming to BIS 875-1987. 2. Panels shall be made up of 18-gauge steel of 600 mm × 600 mm size treated for corrosion and coated with epoxy conductive paint (minimum thickness 50 Micron). 3. Raised flooring covering shall be antistatic, high-pressure laminate, two (2) mm thick in approved shade and color with PVC trim edge. It shall not make any noise while walking on it or moving	

#	Description	Bidder Compliance (Yes/No)
	equipment. Load and stress tests on floor panels shall be performed as part of acceptance testing.	
E.	**Painting**	
1	Providing and applying Fire retardant paint of pre-approved make and shade to give an even shade over a primer coat as per manufacturers' recommendations after applying painting putty to level and plumb and finishing with 2 coats of fire retardant paint. Base coating shall be as per manufacturer's recommendation for coverage of paint.	
2	For all vertical Plain surface.	
3	For fire line gyp-board ceiling.	
4	Providing and laying POP punning over cement plaster in perfect line and level with thickness of 10 - 12 mm including making good chases, grooves, edge banding, scaffolding pockets etc.	
5	Applying approved fire retardant coating on all vertical surfaces, furniture etc. as per manufacturer's specification.	

6.14.2. PVC Conduit

#	Description	Bidder Compliance (Yes/No)
1.	The conduits for all systems shall be high impact rigid PVC heavy-duty type and shall comply with I.E.E regulations for non-metallic conduit 1.6 mm thick as per IS 9537/1983.	
2.	All sections of conduit and relevant boxes shall be properly cleaned and glued using appropriate epoxy resin glue and the proper connecting pieces, like conduit fittings such as Mild Steel and should be so installed that they can remain accessible for existing cable or the installing of the additional cables.	
3.	No conduit less than 20mm external diameter shall be used. Conduit runs shall be so arranged that the cables connected to separate main circuits shall be enclosed in separate conduits, and that all lead and return wire of each circuit shall be run to the same circuit.	

#	Description	Bidder Compliance (Yes/No)
4.	All conduits shall be smooth in bore, true in size and all ends where conduits are cut shall be carefully made true and all sharp edges trimmed. All joints between lengths of conduit or between conduit and fittings boxes shall be pushed firmly together and glued properly.	
5.	Cables shall not be drawn into conduits until the conduit system is erected, firmly fixed and cleaned out. Not more than two right angle bends or the equivalent shall be permitted between draw and junction boxes. Bending radius shall comply with I.E.E regulations for PVC pipes.	
6.	Conduit concealed in the ceiling slab shall run parallel to walls and beams and conduit concealed in the walls shall run vertical or horizontal.	
7.	The chase in the wall required in the recessed conduit system shall be neatly made and shall be of angle dimensions to permit the conduit to be fixed in the manner desired. Conduit in chase shall be hold by steel hooks of approved design of 60cm center the chases shall be filled up neatly after erection of conduit and brought to the original finish of the wall with cement concrete mixture 1:3:6 using 6mm thick stone aggregate and course sand.	

6.14.3. Wiring

#	Description	Bidder Compliance (Yes/No)
1.	PVC insulated copper conductor cable shall be used for sub circuit runs from the distribution boards to the points and shall be pulled into conduits. They shall be stranded copper conductors with thermoplastic insulation of 650 / 1100 volts grade. Colour code for wiring shall be followed.	
2.	Looping system of wring shall be used, wires shall not be jointed. No reduction of strands is permitted at terminations.	
3.	Wherever wiring is run through trunking or raceways, the wires emerging from individual distributions shall be bunched together with cable straps at required regular intervals.	

#	Description	Bidder Compliance (Yes/No)
	Identification ferrules indication the circuit and D.B. number shall be used for sub main, sub circuit wiring the ferrules shall be provided at both end of each sub main and sub-circuit.	
4.	Where, single phase circuits are supplied from a three phase and a neutral distribution board, no conduit shall contain wiring fed from more than one phase in any one room in the premises, where all or part of the electrical load consists of lights, fans and/or other single phase current consuming devices, all shall be connected to the same phase of the supply.	
5.	Circuits fed from distinct sources of supply or from different distribution boards or M.C.B.s shall not be bunched in one conduit. In large areas and other situations where the load is divided between two or three phases, no two single-phase switches connected to difference phase shall be mounted within two meters of each other.	
6.	All splicing shall be done by means of terminal blocks or connectors and no twisting connection between conductors shall be allowed.	
7.	Metal clad sockets shall be of die cast non-corroding zinc alloy and deeply recessed contact tubes. Visible scraping type earth terminal shall be provided. Socket shall have push on protective cap.	
8.	All power sockets shall be piano type with associate's switch of same capacity. Switch and socket shall be enclosed in a M. S. sheet steel enclosure with the operating knob projecting. Entire assembly shall be suitable for wall mounting with Bakelite be connected on the live wire and neutrals of each circuit shall be continuous everywhere having no fuse or switch installed in the line excepting at the main panels and boards. Each power plug shall be connected to each separate and individual circuit unless specified otherwise. The power wiring shall be kept separate and distinct from lighting and fan wiring. Switch and socket for light and power shall be separate units and not combined one.	
9.	Balancing of circuits in three phases installed shall be arranged before installation is taken up. Unless otherwise specified not more than ten light points shall be grouped on one circuit and the load per circuit shall not exceed 1000 watts.	

6.14.4. Cable Work

#	Description	Bidder Compliance (Yes/No)
1.	Cable ducts should be of such dimension that the cables laid in it do not touch one another. If found necessary the cable shall be fixed with clamps on the walls of the duct. Cables shall be laid on the walls/on the trays as required using suitable clamping/ fixing arrangement as required. Cables shall be neatly arranged on the trays in such manner that a criss-crossing is avoided and final take off to switch gear is easily facilitated. Cable shall be laid as per the IS standard	
2.	All cables will be identified close to their termination point by cable number as per circuit schedule. Cable numbers will be punched on 2mm thick aluminium strips and securely fastened to the. In case of control cables all covers shall be identified by their wire numbers by means of PVC ferrules. For trip circuit identification additional red ferrules are to be used only in the switch gear / control panels, cables shall be supported so as to prevent appreciable sagging. In general distance between supports shall not be greater than 600mm for horizontal run and 750mm for vertical run.	
3.	Each section of the rising mains shall be provided with suitable wall straps so that same the can be mounted on the wall.	
4.	Whenever the rising mains pass through the floor they shall be provided with a built-in fire proof barrier so that this barrier restricts the spread of fire through the rising mains from one section to the other adjacent section. Neoprene rubber gaskets shall be provided between the covers and channel to satisfy the operating conditions imposed by temperature weathering, durability etc.	
5.	Necessary earthling arrangement shall be made alongside the rising mains enclosure by Mean of a GI strip of adequate size bolted to each section and shall be earthed at both ends. The rising mains enclosure shall be bolted type.	
6.	The space between data and power cabling should be as per standards and there should not be any criss-cross wiring of the two, in order to avoid any interference, or corruption of data.	

6.14.5. Earthing

All electrical components are to be earthen by connecting two earth tapes from the frame of the component ring and will be connected via several earth electrodes. The cable arm will be earthen through the cable glands. Earthling shall be in conformity with provision of rules 32, 61, 62, 67 & 68

of Indian Electricity rules 1956 and as per IS-3043. The entire applicable IT infrastructure in the Control Rooms shall be earthed.

#	Description	Bidder Compliance (Yes/No)
1.	Earthing should be done for the entire power system and provisioning should be there to earth UPS systems, Power distribution units, and AC units etc. so as to avoid a ground differential. State shall provide the necessary space required to prepare the earthing pits.	
2.	All metallic objects on the premises that are likely to be energized by electric currents should be effectively grounded.	
3.	The connection to the earth or the electrode system should have sufficient low resistance in the range of 0 to 25 ohm to ensure prompt operation of respective protective devices in event of a ground fault, to provide the required safety from an electric shock to personnel & protect the equipment from voltage gradients which are likely to damage the equipment.	
4.	Recommended levels for equipment grounding conductors should have very low impedance level less than 0.25 ohm.	
5.	In case of a UPS and Transformer equipment, the Earth resistance shall be automatically measured on an online basis at a pre-configured interval and corrective action should be initiated based on the observation. The automatic Earthing measurements should be available on the UPS panel itself	
6.	There should be enough space between data and power cabling and there should not be any cross wiring of the two, in order to avoid any interference, or corruption of data.	
7.	The earth connections shall be properly made.	
8.	A complete copper mesh earthing grid needs to be installed for the server farm area, every rack need to be connected to this earthing grid. A separate earthing pit needs to be in place for this copper mesh.	
9.	Provide separate earthing pits for servers, UPS & generators as per the standards.	

6.14.6. Fire Detection and Control Mechanism

Fire can have disastrous consequences and affect operations of a Control Room. It is required that there is early-detection of fire for effective functioning of the Control Room.

#	Description	Bidder Compliance (Yes/No)
A.	**System Description**	

#	Description	Bidder Compliance (Yes/No)
1	The Fire alarm system shall be an automatic 1 ton (e.g. 8) zone single loop addressable fire detection and alarm system, utilizing conventional detection and alarm sounders.	
2	Detection shall be by means of automatic heat and smoke detectors located throughout the Control Room (ceiling, false floor and other appropriate areas where fire can take place) with break glass units on escape routes and exits.	
B.	**Control and Indicating Component**	
1	The control panel shall be a microprocessor based single loop addressable unit, designed and manufactured to the requirements of EN54 Part 2 for the control and indicating component and EN54 Part 4 for the internal power supply.	
2	All controls of the system shall be via the control panel only.	
3	The system status shall be made available via panel mounted LEDs and a backlit 8 line x 40-character alphanumeric liquid crystal display.	
4	All system controls and programming will be accessed via an alphanumeric keypad. The control panel will incorporate form fill menu driven fields for data entry and retrieval.	
5	The system will include a detection verification feature. The user shall have the option to action a time response to a fire condition. This time shall be programmable up to 10 minutes to allow for investigation of the fire condition before activating alarm outputs. The operation of a manual call point shall override any verify command.	
C.	**Manual Controls**	
1	Start sounders	
2	Silence sounders	
3	Reset system	
4	Cancel fault buzzer	
5	Display test	
6	Delay sounder operation	
7	Verify fire condition	
8	Disable loop	
D.	**Smoke detectors**	
1	Smoke detectors shall be of the optical or ionisation type. Devices shall be compatible with the CIE conforming to the requirements of EN54 Part 7 and be LPCB approved. The	

#	Description	Bidder Compliance (Yes/No)
	detectors shall have twin LEDs to indicate the device has operated and shall fit a common addressable base.	
2	Heat detectors	
3	Heat detectors shall be of the fixed temperature (58° C) or rate of temperature rise type with a fixed temperature operating point.	
4	Devices shall be compatible with the CIE conforming to the requirements of EN54 Part 5 and be LPCB approved.	
5	The detectors shall have a single LED to indicate the device has operated and shall fit a common addressable base.	
E.	**Addressable detector bases**	
1	All bases shall be compatible with the type of detector heads fitted and the control system component used. Each base shall comprise all necessary electronics including a short circuit isolator.	
2	The device shall be automatically addressed by the CIE on power up of the loop without the need of the insertion of a pre-programmed EPROM or setting of DIL switches.	
3	Detector bases shall fit onto an industry standard conduit box.	
F.	**Audible Alarms**	
1	Electronic sounders shall be coloured red with adjustable sound outputs and at least 3 sound signals. The sounders should be suitable for operation with a 24V DC supply providing a sound output of at least 100dBA at 1 meter and 75 dBA min, for a bed head or sounder base type device. The sounder frequency shall be in the range of 500Hz to 1000Hz.	
G.	**Commissioning**	
1	The fire detection and alarm system will be programmable and configurable via an alpha numeric keypad on the control panel.	

6.14.7. Access Control System

The Access Control System shall be deployed with the objective of allowing entry and exit to and from the premises to authorized personnel only. The system deployed shall be based on Biometric Technology. An access control system consisting of a central PC, intelligent controllers, power supplies and all associated accessories is required to make a fully operational on line access control system. Access control shall be provided for doors. These doors shall be provided with electric locks, and shall operate on fail-safe principle. The lock shall remain unlocked in the event of a fire alarm or in the event of a power failure. The fire alarm supplier shall make potential free contacts available for releasing the locks in a fire condition especially for staircase and main doors. Entry to the restricted area shall be by showing a proximity card near the reader and exit shall be using a push

button installed in the secure area. The system shall monitor the status of the doors through magnetic reed contacts. The system should be designed and implemented to provide following functionality:

#	Description	Bidder Compliance (Yes/No)
1	Controlled Entries to defined access points	
2	Controlled exits from defined access points	
3	Controlled entries and exits for visitors	
4	Configurable system for user defined access policy for each access point	
5	Record, report and archive each and every activity (permission granted and / or rejected) for each access point.	
6	User defined reporting and log formats	
7	Fail safe operation in case of no-power condition and abnormal condition such as fire, theft, intrusion, loss of access control, etc.	
8	Day, Date, Time and duration based access rights should be user configurable for each access point and for each user.	
9	One user can have different policy / access rights for different access points.	

7. Annexure II: Detailed Scope of Work and Considerations

7.1. Scope of Work

7.1.1. Inception Phase

The MSI will be responsible for preparation of detailed project plan. The plan shall address at the minimum the following:

i. Define an organized set of activities for the project and identify the interdependence between them.

ii. Resource planning and loading for each phase/activity. This must also indicate where each resource would be based during that phase, i.e. onsite at the ASCL office or off site at MSI premises.

iii. Establish and measure resource assignments and responsibilities

iv. Highlight the milestones and associated risks

v. Communicate the project plan to stakeholders with meaningful reports.

vi. Measure project deadlines and performance objectives.

vii. Project Progress Reporting. During the implementation of the project, the MSI should present weekly reports. This report will be presented in the steering committiee meeting to ASCL. The report should contain at the minimum the under mentioned:

   a. Results accomplished during the period (weekly)

   b. Cumulative deviations from the schedule date as specified in the finalized Project Plan

   c. Corrective actions to be taken to return to planned schedule of progress

   d. Plan for the next week

   e. Proposed revision to planned schedule provided such revision is necessitated by reasons beyond the control of MSI

   f. Support needed

   g. Highlights/lowlights

   h. Issues/Concerns

   i. Risks/Show stoppers along with mitigation

viii. Identify the activities that require the participation of client personnel (including ASCL, the Program Management Unit etc.) and communicate their time requirements and schedule early enough to ensure their full participation at the required time.

7.1.2. Requirement Phase

The MSI must perform the detailed assessment of the business requirements and IT Solution

requirements as mentioned in this RFP. Based on the understanding and its own individual assessment, MSI shall develop & finalize the System Requirement Specifications (SRS) in consultation with ASCL and its representatives. While doing so, MSI at least is expected to do following:

i. MSI shall study and revalidate the requirements given in the RFP with ASCL and submit as an exhaustive FRS document.

ii. MSI shall develop the FRS and SRS documents.

iii. MSI shall develop and follow standardized template for requirements capturing and system documentation.

iv. MSI must maintain traceability matrix from SRS stage for the entire implementation.

v. MSI must get the sign off from user groups formed by ASCL.

vi. For all the discussion with ASCL team, MSI shall be required to be present at ASCL office with the requisite team members.

vii. Prior to starting the site clearance, the MSI shall carry out survey of field locations as specified in Annexure IX, for buildings, structures, fences, trees, existing installations, etc.

viii. The infrastructure of existing traffic signal and other street ICT infrastructure may need to be dismantled and replaced with the new systems which are proposed and required under the scope of the project. The infrastructure like poles, cantilevers, cabling, aspects etc. should be reused to derive economies for the project with prior approval of ASCL. The dismantled infrastructure shall be delivered at the ASCL designated location without damage at no extra cost.

ix. All existing road signs which are likely to be effected by the works are to be carefully taken down and stored. Signs to be re-commissioned shall be cleaned, provided with new fixings where necessary and the posts re-painted in accordance with ASCL guidelines. Road signs, street name plate, etc. damaged by the MSI during their operation shall be repaired or replaced by MSI at no additional cost.

x. The MSI shall directly interact with electricity boards for provision of mains power supply at all desired locations for field solution. ASCL shall facilitate the same. The recurring electricity charges will be borne by ASCL as per actual consumption.

7.1.3. Design Phase

The MSI shall build the solution as per the Design Considerations detailed in Section 5. The solution proposed by MSI should comply with the design considerations requirements as mentioned therein.

7.1.4. Development Phase

The MSI shall carefully consider the scope of work and provide a solution that best meets the project's requirements. Considering the scope set in this RFP, the MSI shall carefully consider the solutions it proposes and explicitly mention the same in the technical proposal. The implementation of the application software will follow the procedure mentioned below:

a. Software Products (Configuration and Customization): In case MSI proposes software products the following need to be adhered:

i. MSI will be responsible for supplying the application and licenses of related software products and installing the same so as to meet project requirements.

ii. MSI shall have provision for procurement of licenses in a staggered manner as per the actual requirement of the project.

iii. The MSI shall perform periodic audits to measure license compliance against the number of valid End User software licenses consistent with the terms and conditions of license agreements, volume purchase agreements, and other mutually agreed upon licensed software terms and conditions. The MSI shall report any exceptions to license terms and conditions at the right time to ASCL. However, the responsibility of license compliance solely lies with the MSI. Any financial penalty imposed on ASCL during the contract period due to license non-compliance shall be borne by MSI.

iv. MSI shall also supply any other tools & accessories required to make the integrated solution complete as per requirements. For the integrated solution, the MSI shall supply:

a) Software & licenses.

b) Supply tools, accessories, documentation and provide a list of the same. Tools and accessories shall be part of the solution.

c) System Documentation: System Documentation both in hard copy and soft copy to be supplied along with licenses and shall include but not limited to following. Documentation to be maintained, updated and submitted to ASCL regularly :

- Functional Requirement Specification (FRS)
- High level design of whole system
- Low Level design for whole system / Module design level
- System Requirements Specifications (SyRS)
- Any other explanatory notes about system
- Traceability matrix
- Technical and product related manuals
- Installation guides
- User manuals
- System administrator manuals
- Toolkit guides and troubleshooting guides
- Other documents as prescribed by ASCL
- Quality assurance procedures

- Change management histories
- Version control data
- SOPs, procedures, policies, processes, etc developed for ASCL
- Programs :
  - Entire source codes
  - All programs must have explanatory notes for understanding
  - Version control mechanism
  - All old versions to be maintained
- Test Environment :
  - Detailed Test methodology document
  - Module level testing
  - Overall System Testing
  - Acceptance test cases

These documents need to be updated after each phase of project and to be maintained updated during entire project duration. The entire documentation will be the property of ASCL.

7.1.5. Integration Phase

The Command and control center should be integrated with feeds of all tracks/component under the ICCC Project. The MSI shall provide the testing strategy including traceability matrix, test cases and shall conduct the testing of various components of the software developed/customized and the solution as a whole. The testing should be comprehensive and should be done at each stage of development and implementation.

The broad scope of work to be covered under Integration Phase will include the following, but is not limited to:

S. No.	Departments/Systems	Minimum Integration Requirements
1)	City Surveillance & ITMS	• Integrates with existing cameras and new cameras. Should support multiple video sources from multiple locations. Platform should have no limitation in displaying the number of CCTV video sources • Integrate and assess inputs from different sources such as CCTV, ANPR, RLVD, Speed detection systems, Traffic Violation cameras, Emergency Call Box/Panic Buttons, PA Systems, Video Analytics, and other sensors further to assist with actionable intelligence. • CCTV, Video Analytics, and sensors further to assist with

S. No.	Departments/Systems	Minimum Integration Requirements
		actionable intelligence. • Should use dynamic channel coverage specifically for video stream function for efficient bandwidth usage for multiple Remote Control center • Display module should have capability to control multi-screened display wall in sync with operator console • Should support Fixed type and PTZ camera. Control PTZ function from the screen to control the camera But with changing tile configuration each camera should be viewed with much lower resolution. • The system should dynamically reduce the bit rate and bandwidth for each stream based on the viewing resolution at the remote location. • Integration with GIS map
2)	Public Wi-fi	• ICCC should integrate with Wi-Fi solution and project real time user information on city dashboard • Integration with GIS map
3)	Environmental Monitoring (sensor based/ hosted on Intelligent Pole)	• Monitor key inputs from city environmental sensors like Temperature, Humidity, CO, CO2, NO2, SO2, PM10, PM2.5, • Create awareness within the city based on dynamic inputs received from sensors and display output to various interfaces including city application, multi-services • Integration with GIS map
4)	Smart Governance(ERP) Birth & Death Module, Assets Managemen, Vanue Booking etc.. (for future integration)	• Integrate the portal for displaying birth and death data via APIs • Integrate with master data and other modules for information validity • MIS Reports on Birth/Death information per location/age/gender etc. viz., ▪ Online Birth Certificates printed today ▪ Online Death Certificates printed today ▪ Total Birth Certificates printed ▪ Total Death Certificates printed ▪ Birth Registrations – Today ▪ Birth Registrations – Total ▪ Death Registrations – Today ▪ Death Registrations – Total ▪ Re-print requests per day/month ▪ Verification requests per day/month ▪ Pending Certificates issuance

S. No.	Departments/Systems	Minimum Integration Requirements
		▪ Location/Hospital wise birth/death registrations ▪ Age group wise death registrations ▪ Gender wise birth/death registrations • Analytics on Population vs Birth/Death • KPI's on birth and death certificate issuance by location per location • Integration with GIS map
5)	Smart LED Street Lights (for future integration)	• The ICCC should aggregate various data feeds from light sensors and systems further process information out of these data feeds to provide interface /dashboards for generating alert and notifications in real time. • Provide single dashboard of various brand of lighting solution. • ICCC should support lighting control like diming, switch on/off, group control etc. • ICCC should provide reports of various brand of lighting solution • Integration with GIS map
6)	GPS	• ICCC should integrate with Vehicle tracking • ICCC should Garbage vehicles, C&D Waste, Municipal sweepers, water tankers etc. • Actionable alerts • Summary of distance travelled by each vehicle. • Violations • Integration with GIS map
7)	GIS Based Property Tax (for future integration)	• The Property Tax module should be integrated into ICCC • ICCC uses an ESB or IoT API Adapter for consuming the web services from Property Tax application • ICCC Integration Engine stores auth and other historic data for generating reports • ICCC initially makes call to get the authentication tokens for calling web services • ICCC makes calls to get the required data from Urban Local Bodies (ULB) viz., City Corporation, City Municipal Council, Town Municipal etc., • ICCC expects the following services viz., Property Details per Location, • ICCC displays the analytical information of property tax collections across the in a GIS map

S. No.	Departments/Systems	Minimum Integration Requirements
		▪ All the below services can be integrated into ICCC ▪ Create New Property ▪ Get Property details ▪ Get Property Bill ▪ Make Payment ▪ Get Receipt • Following reports can be displayed on ICCC, if required ▪ Demand / Collection Register ▪ Assessment Register ▪ Ward-wise / Zone-wise Recovery reports ▪ Top Defaulters Report ▪ Occupancy wise / Flat wise report' ▪ Tax-wise Recovery Details ▪ Tax-wise Demand Details ▪ Advance Payment Reports ▪ Objection / Hearing Details • Integration with GIS map
8)	Mobile App (for future integration)	• Provides unified northbound API to abstract diverse sensors and its attributes by single northbound API to allow interfacing and integration with existing systems. • The platform should be able to normalize the data coming from different devices of same type (i.e. Different lighting sensor from different OEMs, different energy meters from different OEMs etc.) and provide secure access to that data using data API(s) to application developers. • Provides Query-based language to access sensor parameter from sensor cloud • Provides mechanism to translate and map business logic to sensor functionality • Integration with GIS map

Following are the minimum use cases identified for integration for above mentioned integrations. The bidder is expected to propose more use cases based on the global leading practices and project experiences:

S. No.	Departments/ Systems	Relevant ICCC Use Cases	Data Feed Frequency	Dataset Required
1.	Solid Waste Management	Display type of fleet vehicle (AMC garbage Collector)	Batch	Categorized information of various fleet types available in the city
2.		Receive and Display Surveillance Feed	Real-time	Real-time/Near real-time feed of Surveillance Cameras
3.	Transit Management System	Show position of Buses, Autorickshaws, AMV vehicles on the route	Batch	Documentation of Bus Routes
4.			Real-time	Real-time/Near real-time location of the Buses
5.	ITMS & City Surveillance	Show location of traffic lights	Batch	Location coordinates of traffic light installations at junctions
6.		Show Status of Traffic Lights	Real-time	Real-time/Near real-time status of traffic lights downtime
7.		Show location of CCTV Cameras	Batch	Location coordinates of CCTV Cameras installations at junctions
8.		Show Status of CCTV Cameras	Real-time	Real-time/Near real-time status of CCTV Cameras downtime
9.		Show location of Enforcement System	Batch	Location coordinates of Enforcement System installations at

S. No.	Departments/ Systems	Relevant ICCC Use Cases	Data Feed Frequency	Dataset Required
				junctions
10.		Show Status of Enforcement System	Real-time	Real-time/Near real-time status of Enforcement System downtime
11.		Show location of VMD Boards	Batch	Location coordinates of VMD Boards installations at junctions
12.		Show Status of VMD Boards	Real-time	Real-time/Near real-time status of VMD Boards downtime
13.		Forecast Demand	Batch	Energy usage across 5 previous years
14.	Street Lights	Identify location of Street Lights	Batch	Location coordinates of Street Lights
15.		Control Street Lights status	Real-time	Real-time/Near real-time status of street lights functioning
16.		Show Status of Street Lights	Real-time	Real-time/Near real-time status of street lights functioning
17.	Property Tax	Show the Properties on GIS map	Batch	Location geo-fenced coordinates of Properties
18.		Display heat map of tax collections by each ward	Batch	Tax collections data by each ward

S. No.	Departments/ Systems	Relevant ICCC Use Cases	Data Feed Frequency	Dataset Required
19.	E-Governance	Show Population by each ward	Batch	Base Population data based on latest census
20.			Batch	Birth and Death data at a regular frequency
21.		Transmit information to citizens	Real-time	Data/Information that has to be broadcast to citizens
22.		Show status of Grievances by Ward	Batch	Details of Grievances received
23.		Show location of Public Advertisement Boards	Batch	Location coordinates of Public Advertisements
24.		Show Public Advertisements availability status	Batch	Booking status of Public Advertisements
25.		Display heat map of advertisement tax collections by each ward	Batch	Tax collections data by each ward
26.	Disaster Management	Identify Disaster Impact Area on map	Real-time	Coordinates to Geo-fence the Disaster Zone
27.		Respond to Disaster Situation	Real-time	Documented Standard Operating Procedures
28.	Emergency Management	Identify Location of Fire Hydrants	Batch	Location coordinates of Fire Hydrants

S. No.	Departments/ Systems	Relevant ICCC Use Cases	Data Feed Frequency	Dataset Required
29.		Show position of Fleet on the city map	Real-time	Real-time/Near real-time location of the Fleet
30.		Display type of fleet vehicle	Batch	Categorized information of various fleet types available in the city
31.		Respond to Emergency Situation	Real-time	Documented Standard Operating Procedures
32.	Smart Poles	Identify location of Smart Poles	Batch	Location coordinates of Smart Poles
33.		Show Status of Smart Poles – Wi-Fi Hotspots	Real-time	Real-time/Near real-time status of Wi-Fi Hotspots functioning
34.		Show Status of Smart Poles - Panic Button/Emergency Call Box	Real-time	Real-time/Near real-time status of Panic Button/Emergency Call Box functioning
35.		Show Status of Smart Poles - Public Address System	Real-time	Real-time/Near real-time status of PAS functioning
36.		Show Status of Smart Poles - Environmental sensors	Real-time	Real-time/Near real-time status of Environmental Sensors functioning
37.		Show Status of Smart Poles - Smart Billboards	Real-time	Real-time/Near real-time status of Smart Billboards functioning

S. No.	Departments/ Systems	Relevant ICCC Use Cases	Data Feed Frequency	Dataset Required
38.		Show Status of Smart Poles - Surveillance	Real-time	Real-time/Near real-time status of Surveillance Cameras functioning
39.		Show Status of Smart Poles - LED Lights	Real-time	Real-time/Near real-time status of LED Lights functioning
40.		Show Status of Smart Poles - Solar Panel	Real-time	Real-time/Near real-time status of Solar Panel functioning
41.		Receive and Display Surveillance Feed	Real-time	Real-time/Near real-time feed of Surveillance Cameras
42.		Receive and Display Environmental Sensor Feed	Real-time	Real-time/Near real-time feed of Environmental Sensors
43.		Broadcast message on PAS	Real-time	Message to be broadcast on PAS
44.		Play music on PAS	Real-time	Music tracks to be played on PAS
45.		Receive and Send messages through Panic Button/Emergency Call Box	Real-time	Not Applicable

7.1.6. Go-Live Preparedness and Go-Live

a. MSI shall prepare and agree with ASCL, the detailed plan for Go-Live (in-line with ASCL's implementation plan as mentioned in RFP).

b. The MSI shall define and agree with ASCL, the criteria for Go-Live.

c. The MSI shall ensure that all the data migration is done from existing systems.

d. MSI shall submit signed-off UAT report (issue closure report) ensuring all issues raised during UAT are being resolved prior to Go-Live.

e. MSI shall ensure that Go –Live criteria as mentioned in User acceptance testing of Project is met and MSI needs to take approval from ASCL team on the same.

f. Go-live of the application shall be done as per the finalized and agreed upon Go-Live plan.

7.1.7. Revenue Generation Phase

a. ICCC along with its elements is a critical project under smart cities, and it is imperative that the ICCC should be made sustainable to ensure its continuity. Keeping this in mind it shall be the responsibility of the MSI to build and implement a revenue generation strategy for smart solutions and ICCC such as data monetization, Information products etc.

b. The MSI will be free to choose the options for revenue strategy, prepare a Business plan, which will include revenue generation models based on the feasibility and viability, continuity strategy and timelines. The Business Plan shall be vetted and approved by the PMC for the SPV.

c. Once approved, the MSI shall prepare the RFP in consultation of PMC for hiring an agency to Generate revenue from various models and deliver it to SPV

d. The RFP shall also be approved by the PMC for SPV and assist in the hiring the agency through bid process management.

e. The MSI is expected to develop a strategy for revenue generation options from the Integrated Command and Control Center and implemented smart solutions such as information product.

f. The MSI is expected to study the various options for revenue generation from the scope and elements defined for smart solutions implemented.

g. The MSI may introduce new innovative products or solutions by which revenue can be generated at it's own cost.

h. The following key options for revenue generation may be explored (as applicable):

- Information Products for public and institutions
- Data Monetization
- Advertisement
- Laid network monetization
- Wi-Fi data
- Data Centre as IaaS, PaaS, SaaS for city startups

7.1.8. Operations and Maintenance

Success of the Project would lie on how professionally and methodically the entire Project is managed once the implementation is completed. From the MSI perspective too this is a critical phase since the

quarterly payments are linked to the SLA's in the post implementation phases. MSI thus is required to depute a dedicated team of professionals to manage the Project and ensure adherence to the required SLAs. MSI shall provide operations and maintenance services for the software, hardware and other IT and Non-IT infrastructure installed as part of the project after Go-Live for a period of 5 years. Warranty period of the product supplied under project i.e hardware, software, IT/Non-IT etc., will be considered after phase wise Go-Live. The scope of work for the Operations & Maintenance Phase can be categorized under 8 service categories.

7.1.8.1. Project Management & Facilities Management Services

The MSI will be required to provide facilities management services to support the ASCL and stakeholder department officials in performing their day-to-day functions related to this system.

MSI is required to depute a dedicated, centralised project management and technical team for the overall project management and interaction with ASCL and stakeholder departments.

7.1.8.2. Provision of the Operational Manpower & Contact Center Manpower to view the various data feeds and call center operations at ICCC

The MSI is required to provide suitable manpower to monitor the data feeds ICCC and support ASCL, Traffic Police and other stakeholder departments for operationalization of smart solutions of the project. The exact role of these personnel and their responsibilities would be defined and monitored by ASCL and respective departmental personnel. MSI shall be required to provide such manpower meeting following requirements:

1. All such manpower shall be minimum graduate pass
2. All such manpower shall be without any criminal background / record.
3. ASCL reserves the right to carry out background check of the personnel proposed on the Project for verification of criminal record, at the beginning of deployment or during deployment.
4. MSI shall have to replace any person, if not found suitable for the job.
5. All the manpower shall have to undergo training from the MSI for at least 15 working days on the working of project. Training should also cover dos & don'ts and will have few sessions from ASCL and Stakeholders/End User Department officers on right approaches for monitoring the feeds & providing feedback to ASCL, Stakeholders/End User Department officers and other associated government agencies.
6. Each person shall have to undergo compulsory 1 day training every month
7. Operational Manpower shall work in 3 shifts, with no person being made to see the data feeds for more than 8 hours at a stretch.

Detail operational guideline document shall be prepared during implementation which shall specify detail responsibilities of these resources and their do's & don'ts.

The Current estimation of the man-power required from the MSI is as follows:

#	Description	Quantity
1.	Contact Centre Manpower for operationalization of the systems (16 resources in normal working shift & 4 resources each in two shifts)	24

The remaining operational manpower and supervisors required for operationalization of the project will be provided by ASCL, as per requirements.

7.1.8.3. Basic Infrastructure Services

Following services shall be provided by the MSI under the basic infrastructure services:

1. Ensure availability of the infrastructure (both physical and IT) including but not limited to Power, Cooling, Racks, Storage and other peripheral equipment installed at the time of Project commissioning as per the SLAs.
2. Ensure scalability in terms of availability of racks and supporting infrastructure.
3. Proactive and reactive maintenance, repair and replacement of defective components (physical and other peripheral IT infrastructure) installed for the Project through this RFP. The cost for repair and replacement shall be borne by the MSI.
4. Any component (Physical & IT installed at the time of Project commissioning) that is reported to be faulty / non-functional on a given date should be either fully repaired or replaced by temporary substitute (of equivalent configuration) within the time frame agreed upon in the Service Level Agreement (SLA).
5. Proactive monitoring of the entire basic infrastructure installed.
6. MSI shall maintain records of the maintenance of the basic infrastructure and shall maintain a logbook on-site that may be inspected by the ASCL, Police department and other stakeholder departments/end users at any time.

7.1.8.4. Network Monitoring Services

The activities shall include:

1. MSI shall provide services for management of ICCC Project to maintain performance at optimum levels on a 24 x 7 basis.
2. MSI shall monitor and administer the network.
3. MSI shall create and modify VLAN, assignment of ports to appropriate applications and segmentation of traffic.
4. MSI shall carry out break fix maintenance of the LAN cabling or maintenance work requiring civil work.

7.1.8.5. Integration Testing

This shall be a black-box testing role primarily to ensure that the application to be deployed does not disrupt the Agartala operations and affect other Agartala infrastructure in terms of performance and security. The technical tasks to be carried out shall be as follows:

1. Functional Testing: Ensuring that the application functionality as described by the ASCL, Police department and other stakeholder departments/end users. The functional testing of application will necessarily be minimal as this is a core responsibility of the Supplier.
2. Performance Testing: Ensuring that the application meets expressed performance requirements on the Agartala servers by using performance test tools and performance monitoring tools.
3. Security Testing: Testing for exploitable application security weaknesses that undermine the application security or the security of the infrastructure.

7.1.8.6. Vendor Management Services

The activities shall include:

1. Coordination with all the project stakeholders to ensure that all Agartala activities are carried out in a timely manner.
2. MSI shall coordinate and follow-up with all the relevant vendors to ensure that the issues are resolved in accordance with the SLAs agreed upon with them.
3. MSI shall also ensure that unresolved issues are escalated to respective departments.
4. MSI shall maintain database of the various vendors with details like contact person, telephone nos., escalation matrix, response time and resolution time commitments etc.
5. MSI shall draw a consolidated quarterly SLA performance report across vendors for consideration of the ASCL, Police department and other stakeholder departments/end users.

7.1.8.7. Network Management

The objective of this service is to ensure continuous operation and upkeep of the Network infrastructure of the project including all active and passive components. The selected MSI shall be responsible to coordinate with Network Service Provider for network related issues between ICCC, DC, DR and other sub systems. The services to be provided for Network Management include:

1. Ensuring that the network is available 24x7x365 as per the prescribed SLAs for the 6 years of operations
2. Attending to and resolving network failures and snags.
3. Support and maintain the overall network infrastructure including but not limited to LAN passive components, routers, switches etc.
4. Configuration and backup of network devices including documentation of all configurations.
5. 24x7x365 monitoring of the network to spot the problems immediately.
6. Provide information on performance of Ethernet segments, including capacity utilization and error statistics for the segment and the top-contributing hosts, WAN links and routers.
7. Ensuring timely information to the ASCL, Police department and other stakeholder departments/end users pertaining to issues of Network Backbone

7.1.8.8. Physical Infrastructure Management and Maintenance Services

All the devices that will be installed in the Project as part of the physical infrastructure should be SNMP enabled and shall be centrally and remotely monitored and managed on a 24x7x365 basis. Industry leading infrastructure management solution should be deployed to facilitate monitoring and management of the Infrastructure on one integrated console. The physical infrastructure management and maintenance services shall include:

1. Proactive and reactive maintenance, repair and replacement of defective components (IT and Non-IT/ Hardware and Software). The cost for repair and replacement shall be borne by the MSI.
2. The MSI shall have to stock and provide adequate onsite and offsite spare parts and spare component to ensure that the uptime commitment as per SLA is met. To provide this service it is important for the MSI to have back to back arrangement with the OEMs. The MSI needs to provide a copy of the service level agreement signed with the respective OEMs.
3. Component that is reported to be down on a given date should be either fully repaired or replaced by temporary substitute (of equivalent configuration) within the time frame indicated in the Service Level Agreement (SLA). In case the selected MSI fails to meet the above standards of maintenance, there will be a penalty as specified in the SLA.
4. The selected MSI shall also maintain records of all maintenance of the system and shall maintain a logbook on-site that may be inspected by the ASCL, Police department and other stakeholder departments/end users at any time.

7.1.9. Exit Management

a. This sets out the provisions, which will apply on expiry or termination of the Master Service Agreement, the Project Implementation, Operation and Management SLA.

b. In the case of termination of the Project Implementation and/or Operation and Management, the Parties shall agree at that time whether, and if so during what period, the provisions of this Schedule shall apply.

c. The Parties shall ensure that their respective associated entities carry out their respective obligations set out in this Exit Management Schedule.

7.1.9.1. Cooperation and Provision of Information

During the exit management period:

a. The MSI will allow the ASCL or its nominated agency access to information reasonably required to define the current mode of operation associated with the provision of the services to enable the ASCL to assess the existing services being delivered;

b. Promptly on reasonable request by the ASCL, the MSI shall provide access to and copies of all information held or controlled by them which they have prepared or maintained in accordance with this agreement relating to any material aspect of the services (whether provided by the MSI or sub-contractors appointed by the MSI). The ASCL shall be entitled to copy of all such information. Such information shall include details pertaining to the services rendered and other performance data. The MSI shall permit the ASCL or its nominated agencies to have reasonable access to its employees and facilities, to understand the methods of delivery of the services employed by the MSI and to assist appropriate knowledge transfer.

7.1.9.2. Confidential Information, Security and Data

a. The MSI will promptly on the commencement of the exit management period supply to the ASCL or its nominated agency the following:

- information relating to the current services rendered and customer and performance data relating to the performance of sub-contractors in relation to the services;
- documentation relating to Intellectual Property Rights;
- documentation relating to sub-contractors;
- all current and updated data as is reasonably required for purposes of ASCL or its nominated agencies transitioning the services to its Replacement MSI in a readily available format nominated by the ASCL, its nominated agency;
- all other information (including but not limited to documents, records and agreements) relating to the services reasonably necessary to enable ASCL or its nominated agencies, or its Replacement MSI to carry out due diligence in order to transition the provision of the Services to ASCL or its nominated agencies, or its Replacement MSI (as the case may be).

b. Before the expiry of the exit management period, the MSI shall deliver to the ASCL or its nominated agency all new or up-dated materials from the categories set out in Schedule above and shall not retain any copies thereof, except that the MSI shall be permitted to retain one copy of such materials for archival purposes only.

7.1.9.3. Transfer of Certain Agreements

On request by the ASCL or its nominated agency the MSI shall effect such assignments, transfers, licences and sub-licences ASCL, or its Replacement MSI in relation to any equipment lease, maintenance or service provision agreement between MSI and third party lessors, vendors, and which are related to the services and reasonably necessary for the carrying out of replacement services by the ASCL or its nominated agency or its Replacement MSI.

7.1.9.4. General Obligations of the MSI

a. The MSI shall provide all such information as may reasonably be necessary to effect as seamless handover as practicable in the circumstances to the ASCL or its nominated agency or its Replacement MSI and which the MSI has in its possession or control at any time during the exit management period.

b. For the purposes of this Schedule, anything in the possession or control of any MSI, associated entity, or sub-contractor is deemed to be in the possession or control of the MSI.

c. The MSI shall commit adequate resources to comply with its obligations under this Exit Management Schedule.

7.1.9.5. Exit Management Plan

a. The MSI shall provide the ASCL or its nominated agency with a recommended exit management plan ("Exit Management Plan") which shall deal with at least the following aspects of exit management in relation to the MSA as a whole and in relation to the Project Implementation, and the Operation and Management SLA.

- A detailed program of the transfer process that could be used in conjunction with a Replacement MSI including details of the means to be used to ensure continuing provision of the services throughout the transfer process or until the cessation of the services and of the management structure to be used during the transfer;
- plans for the communication with such of the MSI's sub-contractors, staff, suppliers, customers and any related third party as are necessary to avoid any material detrimental impact on the ASCL's operations as a result of undertaking the transfer;
- (if applicable) proposed arrangements for the segregation of the MSI's networks from the networks employed by ASCL and identification of specific security tasks necessary at termination;
- Plans for provision of contingent support to ASCL, and Replacement MSI for a reasonable period after transfer.

b. The MSI shall re-draft the Exit Management Plan annually thereafter to ensure that it is kept relevant and up to date.

c. Each Exit Management Plan shall be presented by the MSI to and approved by the ASCL or its nominated agencies.

d. The terms of payment as stated in the Terms of Payment Schedule include the costs of the MSI complying with its obligations under this Schedule.

e. In the event of termination or expiry of MSA, and Project Implementation, each Party shall comply with the Exit Management Plan.

f. During the exit management period, the MSI shall use its best efforts to deliver the services.

g. Payments during the Exit Management period shall be made in accordance with the Terms of Payment Schedule.

h. This Exit Management plan shall be furnished in writing to the ASCL or its nominated agencies within 90 days from the Effective Date of this Agreement.

7.1.10. Compliance to Standards & Certifications

a. For a large and complex set up such as the Project, it is imperative that the highest standards applicable are adhered to. In this context, the MSI will ensure that the entire Project is developed in compliance with the applicable standards.

b. During project duration, the MSI will ensure adherence to prescribed standards as provided below:

Sl. No.	Component/Application/System	Prescribed Standard
1.	Information Security	ISO 27001
2.	IT Infrastructure Management	ITIL specifications
3.	Service Management	ISO 20000 specifications
4.	Project Documentation	IEEE/ISO/CMMi (where applicable) specifications for documentation

c. Apart from the above the MSI need to ensure compliance of the project with Government of India IT security guidelines including provisions of:

- The Information Technology Act, 2000" and amendments thereof and
- Guidelines and advisories for information security published by Cert-In/DeitY (Government of India) issued till the date of publishing of tender notice. Periodic changes in these guidelines during project duration need to be complied with.

d. While writing the source code for application modules the MSI should ensure high-quality documentation standards to improve the readability of the software module. An illustrative

list of comments that each module contained within the source file should be preceded by is outlined below:

- The name of the module
- The date when module was created
- A description of what the module does
- A list of the calling arguments, their types, and brief explanations of what they do
- A list of required files and/or database tables needed by the module
- Error codes/Exceptions
- Operating System (OS) specific assumptions
- A list of locally defined variables, their types, and how they are used
- Modification history indicating who made modifications, when the modifications were made, and what was done.

e. Apart from the above, MSI needs to follow appropriate coding standards and guidelines inclusive of but not limited to the following while writing the source code -

- Proper and consistent indentation
- Inline comments
- Structured programming
- Meaningful variable names
- Appropriate spacing
- Declaration of variable names
- Meaningful error messages

f. Quality Audits

- ASCL, at its discretion, may also engage independent auditors to audit any/some/all standards/processes. The MSI shall support all such audits as per calendar agreed in advance. The result of the audit shall be shared with the MSI who has to provide an effective action plan for mitigations of observations/non-compliances, if any.

7.1.11. Project Management and Governance

7.1.11.1. Project Management Office (PMO)

A Project Management office will be set up during the start of the project. The PMO will, at the minimum, include a designated full time Project Manager from MSI. It will also include key persons from other relevant stakeholders including members of ASCL and other officials/representatives by invitation. The operational aspects of the PMO need to be handled by the MSI including maintaining weekly status, minutes of the meetings, weekly/monthly/project plans, etc.

PMO will meet formally on a weekly basis covering, at a minimum, the following agenda items:

i. Project Progress
ii. Delays, if any – Reasons thereof and ways to make-up lost time
iii. Issues and concerns
iv. Performance and SLA compliance reports;
v. Unresolved and escalated issues;
vi. Project risks and their proposed mitigation plan
vii. Discussion on submitted deliverable
viii. Timelines and anticipated delay in deliverable if any
ix. Any other issues that either party wishes to add to the agenda.

During the development and implementation phase, there may be a need for more frequent meetings and the agenda would also include:

i. Module development status
ii. Testing results
iii. IT infrastructure procurement and deployment status
iv. Status of setting up/procuring of the Helpdesk, DC hosting
v. Any other issues that either party wishes to add to the agenda.

Bidder shall recommend PMO structure for the project implementation phase and operations and maintenance phase.

7.1.11.2. Helpdesk and Facilities Management Services

The MSI shall be required to establish the helpdesk and provide facilities management services to support the ASCL and stakeholder department officials in performing their day-to-day functions related to this system.

The MSI shall setup a central helpdesk dedicated (i.e. on premise) for the Project, which shall be supported by individual smart city command centres, implemented and proposed to be setup under Agartala Smart City Programme. This helpdesk would be operational upon implementation of the Project. Providing helpdesk/support services from a shared facility of any other party/provider is not permitted.

Functional requirements of the helpdesk management system, fully integrated with the enterprise monitoring and network management system. The system will be accessed by the stakeholder department officials for raising their incidents and logging calls for support. The detailed service levels and response time, which the MSI is required to maintain for provisioning of the FMS services are described in the Service Level Agreement of this Tender.

MSI shall deploy Manpower during implementation and O&M phases. The deployed resource shall

report to ASCL's Project In-charge for Smart City Project and work closely with Program Management Office of the project. Following are the minimum resources required to be deployed in the Project, however MSI may deploy additional resources based on the need of the Project and to meet the defined SLAs in this RFP:

#	Type of Resource	Minimum Quantity	Minimum Deployment during Operation and Maintenance phase
1.	Project Manager	1	100% (8*5)
2.	Solution Architect	1	Onsite Support to Project team on need basis
3.	Integrated Traffic Management Expert	1	100% (24*7)
4.	Network & Security – Infrastructure Expert	1	100% (24*7)
5.	Server and Storage Expert	1	100% (24*7)
6.	Technical Expert-GIS	1	100% (24*7)
7.	Technical Expert-ICCC	1	100% (24*7)
8.	Command Center Operators	24	100% (24*7 – 16 resources in normal shift & 4 resource each in two shifts)

Note: Numbers provided for staff providing 24*7 support is excluding relievers.

7.1.11.3. Steering Committee

The Steering Committee will consist of senior stakeholders from ASCL, its nominated agencies and MSI. MSI will nominate its Smart City vertical head to be a part of the Project Steering Committee

The MSI shall participate in monthly Steering Committee meetings and update Steering Committee on Project progress, Risk parameters (if any), Resource deployment and plan, immediate tasks, and any obstacles in project. The Steering committee meeting will be a forum for seeking and getting approval for project decisions on major changes etc.

All relevant records of proceedings of Steering Committee should be maintained, updated, tracked and shared with the Steering Committee and Project Management Office by MSI.

During the development and implementation phase of the project, it is expected that there will be at least fortnightly Steering Committee meetings. During the O&M phase, the meetings will be held at least once a quarter.

Other than the planned meetings, in exceptional cases, ASCL may call for a Steering Committee meeting with prior notice to the MSI.

7.1.11.4. Project Monitoring and Reporting

The MSI shall circulate written progress reports at agreed intervals to ASCL and other stakeholders. Project status report shall include Progress against the Project Management Plan, status of all risks and issues, exceptions and issues along with recommended resolution etc.

Other than the planned meetings, in exceptional cases, project status meeting may be called with prior notice to the Bidder. ASCL reserves the right to ask the bidder for the project review reports other than the standard weekly review reports.

7.1.11.5. Risk and Issue management

The MSI shall develop a Risk Management Plan and shall identify, analyse and evaluate the project risks, and shall develop cost effective strategies and action plans to mitigate those risks.

The MSI shall carry out a Risk Assessment and document the Risk profile of ASCL based on the risk appetite and shall prepare and share the ASCL Enterprise Risk Register. The MSI shall develop an issues management procedure to identify, track, and resolve all issues confronting the project. The risk management plan and issue management procedure shall be done in consultation with ASCL.

The MSI shall monitor, report, and update the project risk profile. The risks should be discussed with ASCL and a mitigation plan be identified during the project review/status meetings. The Risk and Issue management should form an agenda for the Project Steering Committee meetings as and when required.

7.1.11.6. Governance procedures

MSI shall document the agreed structures in a procedures manual.

7.1.11.7. Planning and Scheduling

The MSI will prepare a detailed schedule and plan for the entire project covering all tasks and sub tasks required for successful execution of the project. The MSI has to get the plan approved from ASCL at the start of the project and it should be updated every week to ensure tracking of the progress of the project.

The project plan should include the following:

1. The project break up into logical phases and sub-phases;
2. Activities making up the sub-phases and phases;
3. Components in each phase with milestones;
4. The milestone dates are decided by ASCL in this RFP. MSI cannot change any of the milestone completion dates. MSI can only propose the internal task deadlines while keeping the overall end dates the same. MSI may suggest improvement in project dates without changing the end dates of each activity.
5. Key milestones and deliverables along with their dates including those related to delivery and installation of hardware and software;

6. Start date and end date for each activity;
7. The dependencies among activities;
8. Resources to be assigned to each activity;
9. Dependency on ASCL

7.1.11.8. License Metering / Management

The MSI shall track software usage throughout the IT setup so as to effectively manage the risk of unauthorized usage or under-licensing of software installed at the ICCC. This may be carried out through the use of standard license metering tools.

7.1.12. Change Management & Control

7.1.12.1. Change Orders / Alterations / Variations

a. The MSI agrees that the requirements given in the Bidding Documents are minimum requirements and are only indicative. The MSI would need to fetch out the details at the time of preparing the design document prior to actual implementation. It shall be the responsibility of the MSI to meet all the requirements of technical specifications contained in the RFP and any upward revisions and/or additions of quantities, specifications sizes given in the Bidding Documents required to be made during execution of the works, shall not constitute a change order and shall be carried out without a change order and shall be carried out without any time and cost effect to Purchaser.

b. Further upward revisions and or additions required to make MSI's selected equipment and installation procedures to meet Bidding Documents requirements expressed and to make entire facilities safe, operable and as per specified codes and standards shall not constitute a change order and shall be carried out without any time and cost effect to Purchaser.

c. Any upward revision and/or additions consequent to errors, omissions, ambiguities, discrepancies in the Bidding Documents which the MSI had not brought out to the Purchaser's notice in his bid shall not constitute a change order and such upward revisions and/or addition shall be carried out by MSI without any time and cost effect to Purchaser.

7.1.12.2. Change Order

a. The Change Order will be initiated only in case (i) the Purchaser directs in writing the MSI to include any addition to the scope of work covered under this Contract or delete any part of the scope of the work under the Contract, (ii) MSI requests to delete any part of the work which will not adversely affect the operational capabilities of the facilities and if the deletions proposed are agreed to by the Purchaser and for which cost and time benefits shall be passed on to the Purchaser, (iii) the Purchaser directs in writing the MSI to incorporate changes or additions to the technical specifications already covered in the Contract.

b. Any changes required by the Purchaser over and above the minimum requirements given in the specifications and drawings etc. included in the Bidding Documents before giving its approval to detailed design or Engineering requirements for complying with technical

specifications and changes required to ensure systems compatibility and reliability for safe operation (As per codes, standards and recommended practices referred in the Bidding Documents) and trouble free operation shall not be construed to be change in the Scope of work under the Contract.

c. Any change order as stated in Clause 2 a. comprising an alteration which involves change in the cost of the works (which sort of alteration is hereinafter called a "Variation") shall be the Subject of an amendment to the Contract by way of an increase or decrease in the schedule of Contract Prices and adjustment of the implementation schedule if any.

d. If parties agree that the Contract does not contain applicable rates or that the said rates are inappropriate or the said rates are not precisely applicable to the variation in question, then the parties shall negotiate a revision of the Contract Price which shall represent the change in cost of the works caused by the Variations. Any change order shall be duly approved by the Purchaser in writing.

e. Within ten (10) working days of receiving the comments from the Purchaser or the drawings, specification, purchase requisitions and other documents submitted by the MSI for approval, the MSI shall respond in writing, which item(s) of the Comments is/are potential changes(s) in the Scope of work of the RFP document covered in the Contract and shall advise a date by which change order (if applicable) will be submitted to the Purchaser.

7.1.13. Testing and Acceptance Criteria

a. MSI shall demonstrate the following mentioned acceptance criteria prior to acceptance of the solution as well as during project operations phase, in respect of scalability and performance etc. The MSI may propose further detailed Acceptance criteria which the ASCL will review. Once ASCL provides its approval, the Acceptance criteria can be finalized. In case required, parameters might be revised by ASCL in mutual agreement with bidder and the revised parameters shall be considered for acceptance criteria. A comprehensive system should be set up that would have the capability to log & track the testing results, upload & maintain the test cases and log & track issues/bugs identified.

b. The following table depicts the details for the various kinds of testing envisaged for the project:

Type of Testing	Responsibility	Scope of Work
System Testing	MSI	1. MSI to perform System testing 2. MSI to prepare test plan and test cases and maintain it. ASCL may request the MSI to share the test cases and results 3. Should be performed through manual as well as automated methods 4. Automation testing tools to be provided by MSI. ASCL doesn't intend to own these tools
Integration	MSI	1. MSI to perform Integration testing

Type of Testing	Responsibility	Scope of Work
Testing		2. MSI to prepare and share with ASCL the Integration test plans and test cases 3. MSI to perform Integration testing as per the approved plan 4. Integration testing to be performed through manual as well as automated methods 5. Automation testing tools to be provided by MSI. ASCL doesn't intend to own these tools
Performance and load Testing	• MSI • ASCL / Third Party Auditor (to monitor the performance testing)	1. MSI to do performance and load testing. 2. Various performance parameters such as transaction response time, throughput, page loading time should be taken into account. 3. Load and stress testing of the Project to be performed on business transaction volume 4. Test cases and test results to be shared with ASCL. 5. Performance testing to be carried out in the exact same architecture that would be set up for production. 6. MSI need to use performance and load testing tool for testing. ASCL doesn't intend to own these tools. ASCL if required, could involve third party auditors to monitor/validate the performance testing. Cost for such audits to be paid by ASCL.
Security Testing (including Penetration and Vulnerability testing)	• MSI • ASCL / Third Party Auditor (to monitor the security testing)	1. The solution should demonstrate the compliance with security requirements as mentioned in the RFP including but not limited to security controls in the application, at the network layer, network, data centre(s), security monitoring system deployed by the MSI 2. The solution shall pass vulnerability and penetration testing for rollout of each phase. The solution should pass web application security testing for the portal, mobile app and other systems and security configuration review of the infrastructure. 3. MSI should carry out security and vulnerability testing on the developed solution. 4. Security testing to be carried out in the exact same environment/architecture that would be set up for production.

Type of Testing	Responsibility	Scope of Work
		5. Security test report and test cases should be shared with ASCL 6. Testing tools if required, to be provided by MSI. ASCL doesn't intend to own these tools 7. During O&M phase, penetration testing to be conducted on yearly basis and vulnerability assessment to be conducted on half-yearly basis. 8. ASCL will also involve third party auditors to perform the audit/review/monitor the security testing carried out by MSI. Cost for such auditors to be paid by ASCL.
User Acceptance Testing of Project	• ASCL or ASCL appointed third party auditor	1. ASCL / ASCL appointed third party auditor to perform User Acceptance Testing 2. MSI to prepare User Acceptance Testing test cases 3. UAT to be carried out in the exact same environment/architecture that would be set up for production 4. MSI should fix bugs and issues raised during UAT and get approval on the fixes from ASCL / third party auditor before production deployment 5. Changes in the application as an outcome of UAT shall not be considered as Change Request. MSI has to rectify the observations.

Note:

a. Bidder needs to provide the details of the testing strategy and approach including details of intended tools/environment to be used by MSI for testing in its technical proposal. ASCL does not intend to own the tools.

b. The MSI shall work in a manner to satisfy all the testing requirements and adhere to the testing strategy outlined. The MSI must ensure deployment of necessary resources and tools during the testing phases. The MSI shall perform the testing of the solution based on the approved test plan, document the results and shall fix the bugs found during the testing. It is the responsibility of MSI to ensure that the end product delivered by the MSI meets all the requirements specified in the RFP. The MSI shall take remedial action based on outcome of the tests.

c. The MSI shall arrange for environments and tools for testing and for training as envisaged. Post Go-Live; the production environment should not be used for testing and training purpose. If any production data is used for testing, it should be masked and it should be protected. Detailed process in this regard including security requirement should be provided by the MSI in its technical proposal. The process will be finalized with the selected bidder.

d. All the Third Party Auditors (TPA) as mentioned above will be appointed and paid by ASCL directly. All tools/environment required for testing shall be provided by the MSI.

e. STQC/Other agencies appointed by ASCL shall perform the role of TPA. MSI needs to engage with the TPA at the requirement formulation stage itself. This is important so that unnecessary re-work is avoided and the audit is completed in time. The audit needs to be completed before Go-Live of different phases. MSI needs to prepare and provide all requisite information/documents to third party auditor and ensure that there is no delay in overall schedule.

f. The cost of rectification of non-compliances shall be borne by the MSI.

7.1.13.1. Factory Testing

Success MSI shall have to submit Factory Test Certificate for the below mentioned materials before the actual supply of the items.

1. Cable
2. Pole
3. Signal Aspects

Authorized representative from ASCL will visit the manufacturing plant of the product subject to present in India. Authorized representative will check the testing process.

7.1.13.2. Final Acceptance Testing

The final acceptance shall cover 100% of the I Project, after successful testing by the ASCL, Police Department, other stakeholders/end user department or its PMU; a Final Acceptance Test Certificate (FAT) shall be issued by the ASCL to the MSI.

Prerequisite for Carrying out FAT activity:

1. Detailed test plan shall be developed by the MSI and approved by ASCL. This shall be submitted by MSI before FAT activity to be carried out.
2. All documentation related to ICCC Project and relevant acceptance test document (including IT Components, Non IT Components etc.) should be completed & submitted before the final acceptance test to the ASCL.
3. The training requirements as mentioned should be completed before the final acceptance test.
4. Successful hosting of Application, NMS and MIS Software.
5. For both IT & Non-IT equipment's / software manuals / brochures / Data Sheets / CD / DVD / media for all the Agartala Project supplied components.

The FAT shall include the following:

1. All hardware and software items must be installed at respective sites as per the specification.

2. Availability of all the defined services shall be verified.
3. The MSI shall be required to demonstrate all the features / facilities / functionalities as mentioned in the RFP.
4. The MSI shall arrange the test equipment required for performance verification, and will also provide documented test results.
5. The MSI shall be responsible for the security audit of the establishes system to be carried out by a certified third party as agreed by ASCL.

Any delay by the MSI in the Final Acceptance Testing shall render him liable to the imposition of appropriate Penalties. However, delays identified beyond the control of MSI shall be considered appropriately and as per mutual agreement between ASCL and MSI. In the event the MSI is not able to complete the installation due to non-availability of bandwidth from the bandwidth service providers, the Supplier and ASCL may mutually agree to redefine the Network so the MSI can complete installation and conduct the Final Acceptance Test within the specified time.

8. Annexure III: Payment Schedule and Milestones

The payment schedule and milestones are divided into four phases:

1. Implementation & Integration Phase-1
2. Integration Phase
3. Operations and Maintenance Phase

ASCL shall issue a "Request Order" in writing, indicating the number of units of Hardware and Software to be supplied along with the location (Project Site). The ASCL shall continue to issue such request until the full quantities of Hardware and Software specified in volume 1 within the variation limits of RFP is exhausted. Upon getting the Request Order, the MSI shall promptly and as soon as possible within the lead time specified in the request order, supply, install and implement specified numbers of hardware and software at stated project site and commissioned the same. ASCL shall specify the Lead Time in Request Order. The Lead Time of Request Order shall be decided in discussion with the Service Provider before the Request Order is placed. ASCL's decision in this regard shall be final but reasonable time shall be provided to the MSI. Delay or non-performance will form the basis for application of Liquidated Damages. Tentative Number of Request Orders and Lead Time as envisaged at this point of time is specified below.

Services	Approximate Time for Issuance of Request Order	Tentative Scope/ Approximate Sizing	Tentative Lead Time
Request Order 1	One week post issue of LOI/ completion of site survey activity	1. ICCC - IT hardware 2. ICCC - Non-IT equipment 3. ICCC – software 4. Data Center Cloud – Hardware 5. Data Center Cloud- Software 6. Data Center (DC) – Hardware 7. Data Center (DC) – Software 8. Data Center (DC) – Non-IT equipment 9. DR – Hardware 10. DR – Software 11. DC-DR link 12. Implementation and Integration of City Surveillance System – 23 Traffic Junctions/131 Locations 13. Implementation and Integration of Integrated Traffic Management System/ Traffic Violation Detection – 23 Traffic Junctions/Locations	6 months post issuance of Request Order 1

Services	Approximate Time for Issuance of Request Order	Tentative Scope/ Approximate Sizing	Tentative Lead Time
		14. Implementation and Integration of 23 Variable Message Display (VMD) Boards of two sizes at identified Locations 15. Implementation and Integration of Transit Management System for 173 City Buses & 8000 Autorickshaws 16. Implementation& Integration of AVLS in AMC Vehicles 17. Implementation and integraton of PIS at 48 bus stops/ depots 18. Implementation of city wide Wi-Fi with 23 access points 19. Implementation and Integration of Digital Information Kiosk 20. Implementation and Integration of Intelligent Poles – 6 21. Approx 102 km of OFC 22. Integration with GIS (Sub-System) 23. Integration of all smart components with ICCC 24. DR Services	

8.1. Milestones and Payment Schedules for Implementation Phase

Based on findings of the site survey activity done by the MSI, the MSI may propose a change in the number of sites or individual units to be deployed in each phase as well as overall scope and a consequent change in phasing. ASCL also retains the right to suo-moto change the number of sites or individual units to be deployed for each scope item. The final decision on change in phasing and related change in payment schedules shall be at the discretion of ASCL.

MSI should complete all the activities within the defined timelines as indicated above. The timeline will be reviewed regularly during implementation phase and may be extended incase ASCL feels that extension in a particular Request Order/Integration or any track is imperative, for the reason beyond the control of the bidder. In all such cases ASCL's decision shall be final and binding. The MSI will be eligible for the payment based on the completion of activities and approval of the relevant deliverables.

D = Effective Date of Contract Agreement

D1= Date of Issue of Request Order 1

Milestones	Payment Milestones for the Implementation % Payment of Time Schedule Phase	Payment Schedule	Time Schedule	Deliverable
M1	Project Kickoff	Value commensurate to the discovered quote for site survey activity as per commercial format	D	NA
M2	**Request Order**			
M2.1	Request Order – Site Survey of Locations	10% of Request Order Value (Capex Cost) post issuance of Request Order 1	D1 + 15 Days	1. Inception Report 2. Project Plan 3. Risk Management and Mitigation Plan 4. Site Survey report 5. Final BoQ
M2.2	Requirement Phase Completion	10% of Request Order Value (Capex Cost)	D1 + 1 Month	1. Functional Requirement Specification document 2. System Requirement Specification document

Milestones	Payment Milestones for the Implementation % Payment of Time Schedule Phase	Payment Schedule	Time Schedule	Deliverable
	Design Phase Completion			3. Requirements Traceability Matrix
M2.3	Request Order – Delivery and Receipt of Hardware and Software at site and after Verification of such items by ASCL/ASCL authorized agency	30% of Request Order Value (Capex Cost)	D1+ 2 Months	1. HLD documents 2. LLD documents 3. Application architecture documents. 4. Technical Architecture documents. 5. Network Architecture documents. 6. Logical and physical database design. 7. Logical and physical infra architecture. 8. Data dictionary and data definitions. 9. GUI design (screen design, navigation, etc.). 10. Test Plans 11. Change management Plan 12. SoP & KPI
M2.4	Power-up (for hardware), Installation, configuration and Application deployment	20% of Request Order Value (Capex Cost)	D1 + 4 Months	1. IT and Non IT Infrastructure Installation Report 2. Completion of UAT and closure of observations report 3. Training Completion report 4. Application

Milestones	Payment Milestones for the Implementation % Payment of Time Schedule Phase	Payment Schedule	Time Schedule	Deliverable
				deployment and configuration report
M2.5	Request Order – Completion of Integration of Smart Features and Go- Live	20% of Request Order Value (Capex Cost)	D1 + 6 Months	1. Integration Testing Report 2. Go-Live Report
M 2.6	Request Order – Three months of successful operation and Maintenance after Project Acceptance	10% of Request Order Value (Capex Cost)	D1+9 Months	

Note:

- All payments to the Master Systems Integrator (MSI) shall be made upon submission of invoices along with necessary approval certificates from concerned Authorities.
- The above payments are subject to meeting of SLA's failing which the appropriate deductions as mentioned in the SLA document of this RFP.
- Payment for Integration with Individual sub system can be released after 3 months of given timeline of each phase in case of the any of the sub systems of that phase is not ready

8.2. Milestones and Payment Schedules for Operations and Maintenance Phase

The Operations and maintenance phase will start as soon as Go-Live for the each phase occurs. The MSI will be required to adhere to the SLA and provide post implementations support of warranty and O&M for a period of 5 years after implementation/Phase wise Go-Live.

Milestones	Payment Milestones for the Implementation % Payment of Time Schedule Phase	Payment Schedule	Time Schedule
M5	Year 1 payment for O&M after Go-Live	Equal Quarterly O&M Payments	Payment of Year 1
M6	Year 2 payment for O&M after Go-Live	Equal Quarterly O&M Payments	Payment of Year 2
M7	Year 3 payment for O&M after Go-Live	Equal Quarterly O&M Payments	Payment of Year 3
M8	Year 4 payment for O&M after Go-Live	Equal Quarterly O&M Payments	Payment of Year 4
M9	Year 5 payment for O&M after Go-Live	Equal Quarterly O&M Payments	Payment of Year 5

Payment of Operations and maintenance phase will be made on quarterly basis (at completion of each quarter) based on the adherence to SLA, for the amount quoted for each respective year.

9. Annexure IV- Common guidelines regarding compliance of systems/equipment

1. The specifications mentioned for various IT / Non-IT components are indicative requirements and should be treated for benchmarking purpose only. MSIs are required to undertake their own requirement analysis and may propose higher specifications that are better suited to the requirements.
2. Any manufacturer and product name mentioned in the Tender should not be treated as a recommendation of the manufacturer / product.
3. All IT Components should support IPv4 and IPv6
4. All IT/Electronics components shall be in compliance to the IEC/ISI/BSI standards as applicable
5. All systems will be designed to ensure accessibility to the disabled hence all the components related to IT, electronics and/or digital technology should be in accordance to the latest version of WCAG and the European Standards - EN 301 549 or an equivalent standard as approved
6. MSI should adhere with the open standard oneM2M wherever applicable during solution design and implementation
7. The specifications provided in this RFP are indicative and carry guiding rule. The MSI is free to offer products and solutions which meet requirements of the RFP focussing on the outcome, future scalability, security, reliability and adherence to specified SLA under this RFP, in line with applicable standards & best practices adopted in the industry. The MSI is encouraged to design an Optimised solution which is technically superior, innovative, proven, better in terms of functionality and is cost effective. Any specified parameters mentioned in the scope/technical requirement in the RFP may be considered if it is required for meeting current & future requirements during the contract period. Necessary justification should be given in Technical solution accordingly.The MSI is fully responsible for the specified outcome to be achieved.
8. Technical Bid should be accompanied by OEM's product brochure / datasheet. Bidders should provide complete make, model, for all equipment/software quoted, in the Technical Bid.
9. Bidder should ensure that only one make and model is proposed for one component in Technical Bid for example all PTZ cameras must belong to a single OEM and must be of the same model etc.
10. Bidders should ensure warranty and support for all equipment from OEMs during the contract period. All the back-to-back service agreements should be submitted along with the Technical Bid.
11. All equipment, parts should be original and new.
12. The user interface of the system should be a user friendly Graphical User Interface (GUI).

13. Critical core components of the system should not have any requirements to have proprietary platforms and should conform to open standards.
14. For custom made modules, industry standards and norms should be adhered to for coding during application development to make debugging and maintenance easier. Object oriented programming methodology must be followed to facilitate sharing, componentizing and multiple-use of standard code. Before hosting the application, it shall be subjected to application security audit (by any of the CERTIN empanelled vendors) to ensure that the application is free from any vulnerability; and approved by the ASCL.
15. All the Clients Machines / Servers shall support static assigned IP addresses or shall obtain IP addresses from a DNS/DHCP server.
16. The indicative architecture of the system is given in this volume. The Successful Bidder must provide the architecture of the solution it is proposing.
17. The system servers and software applications will be hosted in Data Centers as specified in the Bid. It is important that the entire set of Data Center equipment are in safe custody and have access from only the authorized personnel and should be in line with the requirements & SLAs defined in the RFP .
18. The Servers provided should meet industry standard performance parameters (such as CPU Utilisation of 60 percent or less, disk utilisation of 75 percent or less). In case any non-standard computing environment is proposed (such as cloud), detail clarification needs to be provided in form of supporting documents, to confirm (a) how the sizing has been arrived at and (b) how SLAs would be met.
19. MSI is required to ensure that there is no choking point / bottleneck anywhere in the system (end-to-end) and enforce performance and adherence to SLAs. SLA reports must be submitted as specified in the Bid without fail.
20. All the hardware and software supplied should be from the reputed Original Equipment Manufacturers (OEMs). ASCL/or any other authorized agency as nominated by the Authority reserves the right to ask replacement of any hardware / software if it is not from a reputed brand and conforms to all the requirements specified in the RFP documents.
21. Cameras and the Video Management / Video Analytics Software should be ONVIF Core Specification '2.X' or 'S', 'G' compliant and provide support for ONVIF profiles such as Streaming, Storage, Recording, Playback, retrieval of local stored video and Access Control.
22. System Integrator shall place orders on various OEMs directly and not through any sub-contractor / partner.
23. All licenses should be in the name of the Agartala Smart City Limited (ASCL).

NOTE: For all supply equipment's, registered service/support center of the respective OEM should be existing or established in India within 30 days of award of contract. The Bidder should submit an undertaking from the OEM to that effect.

10. Annexure V - Status of the Systems to be integrated in ICCC in Agartala City

S.No.	ICT Systems	Status of current Automation	Future Roadmap
1	Smart Lighting	No	Yes
3	Integrated Traffic Management System (ITMS)	No	Yes
4	Environment Sensors	No	Yes
5	City Surveillance	Partial	Yes
6	Smart Governance	No	Yes
7	Smart Parking/ MLCP	No	Yes
10	GIS	No	Yes
13	Transit Management System for City Buses	No	Yes

11. Annexure VI – Smart City Guidelines for ensuring Universal Access IT Systems to empower citizens with disability to access ICT systems with ease

Sl. No.	Parameters	Minimum Requirements
1	Text Alternatives	Provide text alternatives for any non-text content so that it can be changed into other forms people need, such as large print, braille, speech, symbols or simpler language.
2	Non-text Content	All images, form image buttons, and image map hot spots have appropriate, equivalent alternative text. Images that do not convey content, are decorative, or contain content that is already conveyed in text are given null alt text (alt="") or implemented as CSS backgrounds. All linked images have descriptive alternative text. Equivalent alternatives to complex images are provided in context or on a separate (linked and/or referenced via longdesc) page.
3	Time-based Media	Provide alternatives for time-based media.
4	Audio Description or Media Alternative (Prerecorded)	A descriptive text transcript OR audio description audio track is provided for non-live, web-based video
5	Adaptable	Create content that can be presented in different ways (for example simpler layout) without losing information or structure.
6	Info and Relationships	Semantic markup is used to designate headings (<h1>), lists (, , and <dl>), emphasized or special text (, <code>, <abbr>, <blockquote>, for example), etc. Semantic markup is used appropriately. Tables are used for tabular data. Where necessary, data cells are associated with their headers. Data table captions and summaries are used where appropriate. Text labels are associated with form input elements. Related form elements are grouped with fieldset/legend.
7	Meaningful Sequence	The reading and navigation order (determined by code order) is logical and intuitive.
8	Use of Color	Color is not used as the sole method of conveying content or distinguishing visual elements. Color alone is not used to distinguish links from surrounding text unless the luminance contrast between the link and the surrounding text is at least 3:1 and an additional differentiation (e.g., it becomes underlined) is provided when the link is hovered over or receives focus.

9	Audio Control	A mechanism is provided to stop, pause, mute, or adjust volume for audio that automatically plays on a page for more than 3 seconds.
10	Resize text	The page is readable and functional when the text size is doubled.
11	Images of Text	If the same visual presentation can be made using text alone, an image is not used to present that text.
12	Keyboard Accessible	Make all functionality available from a keyboard.
13	Keyboard	All page functionality is available using the keyboard, unless the functionality cannot be accomplished in any known way using a keyboard (e.g., free hand drawing). Page-specified shortcut keys and accesskeys (accesskey should typically be avoided) do not conflict with existing browser and screen reader shortcuts.
14	No Keyboard Trap	Keyboard focus is never locked or trapped at one particular page element. The user can navigate to and from all navigable page elements using only a keyboard.
15	Pause, Stop, Hide	Automatically moving, blinking, or scrolling content that lasts longer than 5 seconds can be paused, stopped, or hidden by the user. Moving, blinking, or scrolling can be used to draw attention to or highlight content as long as it lasts less than 5 seconds. Automatically updating content (e.g., automatically redirecting or refreshing a page, a news ticker, AJAX updated field, a notification alert, etc.) can be paused, stopped, or hidden by the user or the user can manually control the timing of the updates.
16	Seizures	Do not design content in a way that is known to cause seizures.
17	Three Flashes or Below Threshold	No page content flashes more than 3 times per second.
18	Navigable	Provide ways to help users navigate, find content, and determine where they are
19	Bypass Blocks	A link is provided to skip navigation and other page elements that are repeated across web pages. If a page has a proper heading structure, this may be considered a sufficient technique instead of a "Skip to main content" link. Note that navigating by headings is not yet supported in all browsers. If a page uses frames and the frames are appropriately titled, this is a sufficient technique for bypassing individual frames.
20	Page Titled	The web page has a descriptive and informative page title.

21	Focus Order	The navigation order of links, form elements, etc. is logical and intuitive.
22	Headings and Labels	Page headings and labels for form and interactive controls are informative. Avoid duplicating heading (e.g., "More Details") or label text (e.g., "First Name") unless the structure provides adequate differentiation between them.
23	Focus Visible	It is visually apparent which page element has the current keyboard focus (i.e., as you tab through the page, you can see where you are).
24	Readable	Make text content readable and understandable
25	Language of Page	The language of the page is identified using the HTML lang attribute
26	Language of Parts	The language of page content that is in a different language is identified using the lang attribute.
27	Predictable	Make Web pages appear and operate in predictable ways.
28	On Input	When a user inputs information or interacts with a control, it does not result in a substantial change to the page, the spawning of a pop-up window, an additional change of keyboard focus, or any other change that could confuse or disorient the user unless the user is informed of the change ahead of time.
29	Compatible	Maximize compatibility with current and future user agents, including assistive technologies.
30	Parsing	Significant HTML/XHTML validation/parsing errors are avoided. In content implemented using markup languages, elements have complete start and end tags, elements are nested according to their specifications, elements do not contain duplicate attributes, and any IDs are unique, except where the specifications allow these features.
31	Name, Role, Value	Markup is used in a way that facilitates accessibility. This includes following the HTML/XHTML specifications and using forms, form labels, frame titles, etc. appropriately. For all user interface components, the name and role can be programmatically determined; states, properties, and values that can be set by the user can be programmatically set; and notification of changes to these items is available to user agents, including assistive technologies.
32	Audio-only and Video-only (Prerecorded)	A descriptive text transcript (including all relevant visual and auditory clues and indicators) is provided for non-live, web-based audio (audio podcasts, MP3 files, etc.). A text or audio description is provided for non-live, web-based video-only (e.g., video that has no audio track).

33	Captions (Prerecorded)	Synchronized captions are provided for non-live, web-based video (YouTube videos, etc.)
34	Captions (Live)	Synchronized captions are provided for all live multimedia that contains audio (audio-only broadcasts, web casts, video conferences, Flash animations, etc.)
35	Audio Description (Prerecorded)	Audio descriptions are provided for all video content NOTE: Only required if the video conveys content visually that is not available in the default audio track.
36	Sensory Characteristics	Instructions do not rely upon shape, size, or visual location (e.g., "Click the square icon to continue" or "Instructions are in the right-hand column"). Instructions do not rely upon sound (e.g., "A beeping sound indicates you may continue.").
37	Distinguishable	Make it easier for users to see and hear content including separating foreground from background.
38	Contrast (Minimum)	Text and images of text have a contrast ratio of at least 4.5:1. Large text - at least 18 point (typically 24px) or 14 point (typically 18.66px) bold has a contrast ratio of at least 3:1.
39	Enough Time	Provide users enough time to read and use content.
40	Timing Adjustable	If a page or application has a time limit, the user is given options to turn off, adjust, or extend that time limit. This is not a requirement for real-time events (e.g., an auction), where the time limit is absolutely required, or if the time limit is longer than 20 hours.
41	Link Purpose (In Context)	The purpose of each link (or form image button or image map hotspot) can be determined from the link text alone, or from the link text and its context (e.g., surrounding paragraph, list item, table cell, or table headers). Links (or form image buttons) with the same text that go to different locations are readily distinguishable.
42	Multiple Ways	Multiple ways are available to find other web pages on the site - at least two of: a list of related pages, table of contents, site map, site search, or list of all available web pages.
43	On Focus	When a page element receives focus, it does not result in a substantial change to the page, the spawning of a pop-up window, an additional change of keyboard focus, or any other change that could confuse or disorient the user.
44	Consistent Navigation	Navigation links that are repeated on web pages do not change order when navigating through the site.

45	Consistent Identification	Elements that have the same functionality across multiple web pages are consistently identified. For example, a search box at the top of the site should always be labeled the same way.
46	Input Assistance	Help users avoid and correct mistakes.
47	Error Identification	Required form elements or form elements that require a specific format, value, or length provide this information within the element's label. If utilized, form validation errors are presented in an efficient, intuitive, and accessible manner. The error is clearly identified, quick access to the problematic element is provided, and user is allowed to easily fix the error and resubmit the form.
48	Labels or Instructions	Sufficient labels, cues, and instructions for required interactive elements are provided via instructions, examples, properly positioned form labels, and/or fieldsets/legends.
49	Error Suggestion	If an input error is detected (via client-side or server-side validation), provide suggestions for fixing the input in a timely and accessible manner.
50	Error Prevention (Legal, Financial, Data)	If the user can change or delete legal, financial, or test data, the changes/deletions can be reversed, verified, or confirmed.
51	Visual Captcha	Alternative mode of authentication should be offered to inorder to be authenticated
52	Mandatory use of Unicode for regional language	Unicode facilitates assistive technology to access content.

12. Annexure VII – Cyber Security Requirements for Agartala Smart City Project

12.1. Cyber Security Framework

The Bidder shall develop Cyber Security Framework aimed at building a secure and resilient cyberspace for citizens and stakeholders of Smart City. The Framework shall be designed to protect cyberspace information and infrastructure; build capabilities to prevent and respond to cyber-attacks; and minimize damages through coordinated efforts of institutional structures, people, processes, and technology. Framework shall cover smart city cyber security architecture with reference to the cyber security framework suggested by National Institute of Standards and Technology (NIST), CSA (Cloud Security Alliance) and ISO27001. Framework shall also comply with MoUD guidelines vide circular K- 1s016/6U2016-SC-1.

12.2. Cyber Security Policy

The Bidder shall ensure creation and implementation of Smart City Cyber Security Policy and related procedures in line with relevant international standards. The policy shall address security of hardware and software, along with the connectivity between the field device and the respective application software. The bidder shall ensure to develop and implement Standard Operating Procedures for smooth Operations and Maintenance of IT infrastructure.

12.3. Cyber Security Governance

1. The Bidder shall conduct Risk Assessment and prepare Risk Treatment Plan for the IT applications and infrastructure deployed in smart city ecosystem.
2. The Bidder shall facilitate management reporting in form of dashboard covering Risk Assessment results along with risk treatment plan and timeline to the smart city management.
3. The Bidder shall implement all the controls as identified during the Risk assessment and treatment plan as per the agreed timelines.

12.4. Cyber Security Organization Structure

1. The Bidder shall clearly define Organization structure for Smart City Cyber Security with skilled personnel and adequate representation from Senior Management. The organization structure shall also include the roles and responsibilities of personnel deployed for cyber security of smart city.
2. The smart city cyber security resources shall be deployed as part of the team during the complete contract period i.e. implementation and operation stage.

12.5. Smart City IT Asset Management

1. The Bidder shall utilize automated asset management tools to prepare the information asset register (IAR) for all IT assets deployed in the Smart city. The IAR shall capture criticality, rating, classification, owner and custodian of the Asset.

2. The Bidder shall develop and implement an appropriate set of procedures for information labeling and handling in accordance with the classification scheme proposed in the cyber security policy of smart city.

12.6. Physical & Environmental Security

1. The bidder shall implement and manage physical security of IT assets of smart city, which shall include, as a minimum: locks, alarms, surveillance equipment, sensors, access control systems (biometrics), etc. The bidder shall also design processes and procedures for same.
2. The Bidder shall ensure that all the equipment, information or software shall not be taken off-site without appropriate authorization.

12.7. Access Control

1. The Bidder shall ensure that users shall be provided single sign on functionality if required for the applications and solutions deployed in Smart City.
2. The smart city solution should support multiple authentication methods such as Username password, two factor authentication, digital certificate and biometric based authentication.
3. 2FA solution should be capable of being deployed on mobile devices deployed for smart city
4. Solution should have the capability to define access based on time of day, day of week or by group or user defined access.
5. The smart city solution should have the functionality to provide authentication based on the role.
6. Remote access to all smart city IT users shall be securely managed.
7. The smart city solution should be able to deploy and configure the approved password policy and should provide the feature to configure the logs.
8. The smart city solution should have the option of blocking multiple sessions for the user.
9. All smart city applications should support role based access control to enforce separation of duties.
10. The application deployed in smart city should display the last login status (successful/unsuccessful, time) to the user and should not store authentication credentials on client computers after a session terminates
11. All smart city solution should be compliant with Indian IT Act, 2000 and Amended IT Act, 2008

12.8. Communications and Operations Management

1. Bidders must ensure that the IT systems in the smart city infrastructure are open, scalable and interoperable. The deployed systems must operate within 4 layers – Sensory layer, communication layer, data layer and application layer adhering to relevant security controls as mandated by the MoUD guidelines.

2. Bidders shall ensure that all the interfaces between IoT devices, field sensors, device applications and storage deployed in smart city are encrypted using appropriate protocols, algorithm and key pairs.
3. All transport link communication must be encrypted and sensitive data both in rest and transit is to be secured using encryption.
4. Bidders must ensure that all the changes made to the smart city infrastructure incl. of IoT field devices, sensors and related applications should be tracked and recorded in order to enable security monitoring of the infrastructure. The maintained logs should be systematically collated, enabling the access of critical information as per date, fortnight, month, quarter, year etc.
5. Bidders should ensure that separate environments are maintained for production, test and development for smart city infrastructure and solutions to reduce the risks of unauthorized access or changes.
6. Bidders must ensure that smart city IT systems are designed in such a way that only authenticated users have access to the smart city database. Also, the provision of access has to be routed only through designated applications.
7. Bidders must ensure that sensitive data is stored in the smart city database in an encrypted format thereby curtailing the database administrator from reading or modifying the stored sensitive data.
8. Bidders must ensure that the smart city architecture should include a VPN solution enabling designated users to access necessary applications and functions from remote applications.
9. Bidders must enable for the maintenance of an audit trail to record all the administrator, user level activities including the failed attempts thereby enabling a robust high level security monitoring of the smart city security infrastructure.
10. Bidders must ensure that the smart city components – Network elements, Operating system, Applications etc. are in sync and adhere to a singular master clock. Thereby ensuring an appropriate logging/ time stamping of incidents and bolstering smooth operation of the smart city.
11. Bidders must ensure that adequate security controls are deployed against the tampering of log information and unauthorized access to the smart city infrastructure such as the data center, IoT device control room etc.
12. Bidders must ensure that platforms hosted in the central data center support multi-tenancy with adequate authentication and role based access. This can be achieved by utilizing Authentication and privilege management technology thereby controlling the access of data as per user privileges.
13. Bidders must ensure that the smart city architecture accounts for latency issues for the flow of data between devices. Suitable protocols should be utilized to minimize data flow latency upon management of heterogeneous data.

14. Bidders must strictly make sure that the communication between IoT field devices and their respective management applications happens only over a data layer (digital platform). Thereby enabling this designated layer to be the one true source of data abstraction, normalization and correlation.
15. Bidders must ensure that the smart city IT infrastructure including the Wi-Fi network adheres to relevant and applicable security standards and protocols. Also, bidders must make sure that the Application Program Interfaces (APIs) are published and the IT systems run on standard protocols.
16. Bidders must ensure that the smart city architecture end-to-end has adequate security controls to enforce safety, privacy and integrity of confidential data. Necessary controls must be deployed to protect the integrity of data flowing into the control systems and other critical infrastructure.
17. Bidders must enable for wireless/ broadband architecture used in the smart city infrastructure to interface with other/citywide wireless networks thereby enabling interoperability.
18. Bidders must ensure that IoT field devices and sensory equipment operating within the smart city periphery connect only to authorize wireless networks. Secure Wi-Fi guidelines as prescribed by the Department of Telecom must be followed.
19. Bidders must make sure that the wireless layer of the smart city network is appropriately segmented, bifurcating the network into various trusted zones. Thereby segregating public and utility networks via VPN (Virtual private networks), ensuring that the traffic from internet users is not routed into sensor networks and vice versa.
20. Bidders must enable for the authentication of the sensory equipment during the provisioning of the sensors and connection into the smart city infrastructure.
21. Bidders must ensure that the data aggregators used for enabling the interoperability between field IoT devices and sensors functioning on different protocols incorporate appropriate authentication and encryption at the aggregator gateway when field devices are not capable of authenticating /encrypting critical information.
22. Bidders must ensure that the IoT field devices and sensory equipment deployed in smart city periphery must not have a physical interface for administration. System and Network monitoring should be only performed remotely thereby ensuring local cyber-attacks/ tampering of field devices is curtailed.
23. Bidders must ensure appropriate network segregation. The smart city data center must be systematically segmented into multiple zones. Each zone must have a dedicated functionality. IoT field devices and sensory equipment must be connected to a completely separate network isolated from public networks and other private networks.
24. Bidders must make sure that the internet facing segment of the data center must incorporate a DMZ (Demilitarized zone), where customer application servers would be located.

Predefined ports must be assigned for enabling the communication between the customer application servers and utility application servers to facilitate the access/transfer of data.

25. Bidders must ensure that Smart city data centers are well equipped with adequate security controls to protect the confidentiality, integrity and accessibility of critical data. The center should consider including cyber security systems such as firewalls, Intrusion detection & Intrusion prevention systems, Web Application Firewalls, Behavioral analysis systems for anomaly detection, Correlation engine, Denial of Service prevention device, Advanced Persistent Threat notification mechanism, Federated identity, access management system etc.
26. Bidders must ensure that the Smart city cyber security infrastructure incorporates high level security and monitoring controls such as SIEM (Security Information and Event Management) tools on all networks, field devices and sensors to identify malicious traffic.
27. Bidders must ensure all smart city applications must be hosted within India and must undergo static and dynamic security testing before deployment. Also, the applications must be periodically (at least once a year) tested for adequate security control.
28. Bidders must ensure that the proposed smart city architecture provides for:
    a. Automatic and secure firmware updates
    b. Device logging and auditing capabilities
    c. Vendor self-certification for non-existence of backdoors, undocumented and hard coded accounts.
29. Bidders must ensure that all the information on security incidents is regularly shared with Indian Computer Emergency Response Team (CERT-ln) and NCIIPC (National Critical Information Infrastructure Protection Centre) and their help is sought for appropriate mitigation and recovery from the security incidents.
30. Bidders shall ensure that Data encryption at rest shall be implemented using departments managed keys, which are not stored in the cloud.
31. The bidder shall setup Cyber Security Continuous Monitoring process to monitor - physical environment, External service provider activity etc. to detect potential cyber security incidents.

12.9. Information Systems Acquisition, Development and Maintenance

1. The Bidder shall prepare the detailed technical security requirement as part of the 'Software Requirement Specification' document with secure coding guidelines for development of applications for smart city.
2. The Bidder shall incorporate validation checks into smart city applications to detect any corruption of information through processing errors or deliberate acts.
3. The Bidder shall obtain information about technical vulnerabilities of information systems being used in smart city, evaluate the exposure to such vulnerabilities, and take appropriate measures to address the associated risk.

4. The bidder shall implement maintenance and repair process of smart city IT assets in timely manner, with approved and controlled tools.

12.10. Business Continuity Planning and Disaster Recovery

1. The Bidder shall implement and operate Disaster Recovery site for the Smart city infrastructure and related IT & OT applications. IT & OT applications and processes should be supported from the disaster recovery site.
2. The Bidder shall define Business Continuity and Disaster Recovery plan and will perform the testing on a half yearly basis

12.11. Information Security Audits

The bidder shall ensure Information security audits of the smart city infrastructure and related applications by a CERT-In empaneled vendor. VA/PT (Vulnerability assessment and Penetration Testing) activities, audits and application security testing must be carried out on twice-a-year basis ensuring optimal operation and security of the smart city infrastructure and applications. Teams carrying out the audit exercise must be different from the implementation teams. Systematic actionable need to be derived post audits and necessary changes need to be made periodically.

12.12. Security Operations Center

The bidder shall set up Security Operations Centre to ensure continuous monitoring and manage all kinds of cyber security operations related to smart city such as Incident Management, Logging and Monitoring, Anti-virus Management, Threat Intelligence Support, Secure Technology Disposal and other cyber security support activities to ensure secured smart city ecosystem.

12.13. Awareness Training

The bidder shall deploy appropriate resources to support periodic awareness training based on latest standards of ISMS. The trainings must focus on educating relevant employees (including privileged users, third party, senior management etc.) on necessary security practices and processes to be followed in order to maintain the Confidentiality, Integrity and Availability of critical data.

12.14. Security Controls for Cloud Services

The security controls for creating and managing cloud services shall comply with the following guidelines.

Empanelment of Cloud Service Offerings CSPs facilities/services shall be compliant with regulative directives and industry best practices. The SLA shall be based on the guidelines issued by Government Departments on contractual terms related to Cloud Services (MeitY guideline dated 31/03/17). The security controls should include the following:

a. The CSP should be empaneled by MeitY for providing cloud services. The CSPs facilities/services shall be certified to be compliant to the following standards: ISO 27001, ISO 27017, ISO 27018, ISO 20000-9, ISO/IEC 20000-1 & PCI DSS.

b. The CSP/Service Provider shall comply or meet any security requirements applicable to CSPs/Service Providers published (or to be published) by MeitY or any standards body setup / recognized by Government of India from time to time and notified to the CSP/Service Providers by MeitY as a mandatory standard.

c. The CSP/Service Provider shall meet all the security requirements indicated in the IT Act 2000, the terms and conditions of the Provisional Empanelment of the Cloud Service Providers and shall comply with the audit criteria defined by STQC.

d. Incident Management shall be managed by CSP / third party.

e. Periodic secure code review shall be performed for cloud applications.

f. Data encryption at rest / transit depending on sensitivity of data shall be implemented using departments managed keys, which are not stored on the cloud.

g. The CSP will undertake to treat information passed on to them as classified. Such Information will not be communicated / published / advertised by the CSP to any person/organization without the express permission of the Department.

h. CSP shall inform all security breach incidents to Smart City management on real time.

i. CSP shall ensure data confidentiality and mention Sub-contractual risk shall be covered by CSP.

j. E-Discovery shall be included as clause in SLA with CSP. It is the process of locating, preserving, collecting, processing, reviewing, and producing Electronically Stored Information (ESI) in the context of or criminal cases/proceedings or investigation. Logging and reporting (e.g., audit trails of all access and the ability to report on key requirements/indicators) must be ensured.

k. The Law Enforcement Agency as mandated under any law for the time being in force may seek access to information stored on cloud as provided by the Service Provider. The onus shall be on the CSP to perform all due diligence before releasing any such information to any such law enforcement agency.

l. CSP must ensure location of all data related to smart cities in India only.

m. The Cloud Service Provider's services offerings shall comply with the audit requirements defined under the terms and conditions of the Provisional Empanelment of the Cloud Service Providers (or STQC /MEITY guidelines. The Audit, Access and Reporting Requirements should be as per the terms and conditions of the Provisional Empanelment of the Cloud Service.

n. CSP's exit Management Plan shall include - Transition of Managed Services & Migration from the incumbent cloud service provider's environment to the new environment and shall follow all security clauses for smooth transition.

o. SLA with CSP shall cover performance management & dispute resolution escalation. Guidelines on Service Level Agreement issued by MeitY lists out the critical SLAs for cloud services.

p. Identification and problem resolution (e.g., helpline, call center, or ticketing system) mechanism must be defined.

q. Change-management process (e.g., changes such as updates or new services) must be defined.

r. Appropriate segregation of Virtual Private Cloud (VPC) security rules defined as part of firewall to restrict access, Role based access management, Logging and monitoring shall be ensured.

s. VPN gateway must be setup to ensure controlled access, appropriate security rules must be employed to encrypt outward data flow, IDS, IPS, API Gateways to be setup and ELB logs to be maintained for any activities and access and exceptions to carried out in the cloud setup, Database logs to be routed as part of the Logging VPC setup.

t. Digital Certificate shall be implemented for secure access.

u. Web Application Firewall must be provided, Host IPS must be setup on all the Web servers, Web servers must be configured as per the CIS hardening guidelines and baseline security requirements, logging and monitoring should be enabled.

v. Application access between hosted smart city applications shall be segregated, internal infrastructure and external traffic, Role based access must be defined, hardening of database instances as per the CIS baselines configuration guidelines in the cloud setup must be ensured, Logging and monitoring must be enabled.

w. For SLAs to be used to steer the behavior of a cloud services provider, imposition of financial penalties is to be incorporated.

x. Monitor Vendor Service level agreement for annual end-to-end service availability of 99.999 percent. The end to end service agreement should be in place for minimum period of six years form the date of operations of the systems.

13. Annexure IX- List of Locations

13.1. Locations for City Surveillance System

S. No.	Location Name	Latitude	Longitude	PTZ	ANPR	Fixed Box Cameras
1	Amtali Mkt	23.777434	91.266432		0	3
2	Amtali Bye pass	23.777181	91.26582		0	3
3	Hapania crossing	23.784961	91.257817	1	0	3
4	ONGC crossing	23.790339	91.267747		0	2
5	Siddhi Ashram	23.799606	91.27279		0	2
6	Badharghat	23.802689	91.272254		0	4
7	Milan Chakra	23.813313	91.270023		0	3
8	AD Nagar, Drop Gate	23.814807	91.267892		0	3
9	Bordowali	23.821902	91.275674		0	3
10	Milan Sangha	23.246462	91.464904		0	3
11	Nagerjala	23.82497	91.267245		0	3
12	Battala round about	23.828383	91.26714		0	4
13	Inside Battala Bazar	23.828938	91.268412		0	3

S. No.	Location Name	Latitude	Longitude	PTZ	ANPR	Fixed Box Cameras
14	Dashamighat	23.82793	91.264604		0	4
15	Infront of Education Director office	23.856264	91.29724		0	3
16	Infront of IGM Hospital	23.831758	91.276422		0	3
17	Melarmath Infront SBI/City Centre	23.829826	91.272555		0	4
18	Krishnanagar,CNG Station	23.834073	91.276419		0	3
19	F.S Chowmuhani	23.815908	91.270847	1	0	4
20	Ker Chowmuhani	23.83764	91.27024		0	4
21	Sankar Chowmuhani	23.83858	91.27031		0	4
22	Ramnagar	23.839977	91.266561		0	4
23	Gol Chakkar	23.836581	91.261548		0	4
24	Durga Chowmuhani	23.842743	91.270616	1	0	4
25	Chandan Khola Crossing	23.837406	91.265144		0	4
26	Bhati Abhoynagar	23.846542	91.274059		0	4
27	Cantonment Road	23.846122	91.277324		0	3
28	Barjala Bholgiri crossing	23.86155	91.277014		0	3

S. No.	Location Name	Latitude	Longitude	PTZ	ANPR	Fixed Box Cameras
29	Panchabati	23.884416	91.259178		0	3
30	Heritage Park	23.856545	91.284911		0	3
31	A.G. Office	23.853449	91.286823		0	3
32	Bholagiri	23.83936	91.285007		0	3
33	Gurkhabasti	23.854672	91.282271	1	0	3
34	Nehru Park	23.853691	91.281944		0	3
35	Mritika crossing	23.839696	91.292715		0	4
36	Secretariat	23.863564	91.291618	1	0	3
37	Back of secretariat	23.863564	91.291618	1	0	3
38	Infront of New Rajbhawan	23.853611	91.284665	1	0	3
39	Back side of Assembly House	23.940848	91.988153	1	0	3
40	High Court Trijunction	23.868536	91.285733	1	0	3
41	Sidhai crossing	23.968671	91.370389		0	4
42	Ushabazar Tri-junction	23.883946	91.251886	1	0	3
43	Airport Crossing	23.892742	91.243846	1	0	3

S. No.	Location Name	Latitude	Longitude	PTZ	ANPR	Fixed Box Cameras
44	SDO electric office, 79 tilla	23.864892	91.295067		0	3
45	Cancer Hospital	23.861155	91.29511		0	3
46	Nandan nagar crossing	23.87358	91.330052		0	3
47	Abhoynagar Post Office	23.845461	91.288739		0	3
48	Budha Mandir	23.847288	91.282719		0	3
49	Haradhan Sangha	23.840049	91.280422		0	4
50	Stable Ground Brigade	23.840537	91.283476		0	3
51	Bijoy Kumar Chowmuhani	23.829673	91.278844		0	4
52	Advisor Chowmuhani	23.837795	91.277305		0	4
53	Colonel Chowmuhani	23.837603	91.280154	1	0	4
54	Bodhjung Chowmuhani	23.836563	91.289555		0	4
55	Lake Chow,Bazaar	23.842244	91.28256		0	3
56	North Gate	23.839526	91.282859	1	0	4
57	Circuit House	23.851165	91.283303		0	4
58	Rajbhawan Back side	23.853518	91.28459	1	0	3

S. No.	Location Name	Latitude	Longitude	PTZ	ANPR	Fixed Box Cameras
59	G.B. Hospital round about	23.859412	91.291206	1	0	3
60	G.B. Hospital Complex	23.859212	91.291351	1	0	3
61	Shyamali Bazar	23.858208	91.289878		0	3
62	Shyamali Bazar Quarter Complex	23.85821	91.289877		0	3
63	Bhagaban Takur Chowmuhani	23.839401	91.287799		0	4
64	Lalbahadur Chowmuhani	23.835867	91.287356		0	4
65	Ganaraj Chowmuhani	23.833901	91.286964		0	4
66	Motor Stand Chowmuhani	23.831501	91.286184	1	0	4
67	Ashram Chowmuhani	23.835547	91.301826		0	3
68	Math Chowmuhani	23.831453	91.292341		0	4
69	Math Chowmuhani Bazar	23.831453	91.292341		0	3
70	Mordern Club Chowmuhani	23.827751	91.291718		0	3
71	MBB Club Chowmuhani	23.827518	91.286327		0	3
72	Netaji Chowmuhani	23.827054	91.278394		0	4

S. No.	Location Name	Latitude	Longitude	PTZ	ANPR	Fixed Box Cameras
73	Golbazar Chowmuhani round about	23.826906	91.283137		0	4
74	Grandiose Chowmuhani	23.833002	91.291878		0	4
75	Masterpara	23.784565	91.258009		0	4
76	Old Hanging Bridge	23.834795	91.291755		0	3
77	Gandhighat	23.827429	91.275826		0	3
78	Paradise Chowmuhani	23.829673	91.278844		0	4
79	Post Office crossing	23.829673	91.278844	1	0	4
80	IGM Chowmuhani	23.831098	91.276014	1	0	4
81	Bidurkarta	23.830773	91.269856		0	4
82	Orient Chowmuhani	23.831735	91.280546		0	4
83	R/S Bhawan	23.853518	91.28459		0	4
84	Surjya Chowmuhani	23.829911	91.280766		0	4
85	Sukantala Road,infront of metro Bazar	23.828473	91.27878		0	3
86	Jackson Gate	23.831736	91.280545		0	4

S. No.	Location Name	Latitude	Longitude	PTZ	ANPR	Fixed Box Cameras
87	Infront of Ujjayanta Market	23.837293	91.282656		0	3
88	Infront of L.N. Bari	23.833965	91.283802		0	3
89	Old Central Jail	23.834757	91.291575		0	3
90	Purbassa	23.834451	91.291889		0	3
91	Chandrapur ISBT	23.839533	91.3066	1	0	4
92	Khayerpur tri-junction	23.845349	91.343534		0	3
93	Radhanagar Motor Stand	23.845188	91.282391	1	0	3
94	Joy Guru	23.832314	91.295047		0	4
95	Priya Electrical	23.8266	91.284749		0	4
96	Modern Club	23.827751	91.291718		0	3
97	Gandhi School	23.825302	91.290985		0	3
98	Vidyasagar Bazar	23.809094	91.263674		0	4
99	Jogendra Bazar	23.820965	91.299909		0	3
100	Jogendra Nagar Railway Station	23.811372	91.307406		0	3
101	Ramthakur Sangha	23.824035	91.287223		0	3

S. No.	Location Name	Latitude	Longitude	PTZ	ANPR	Fixed Box Cameras
102	Gol Bazar, infront of Gopal Mistanna Bhandar	23.830596	91.269641		0	4
103	Inside Gol Bazar	23.826515	91.285542		0	4
104	Masjid Road	23.831118	91.288876		0	3
105	Kaman Chowmuhani	23.830327	91.282237		0	3
106	Bank Round about	23.887608	91.292264		0	4
107	RMS Chowmuhani	23.831919	91.279284		0	3
108	TRTC Tri-junction	23.833326	91.276315		0	3
109	Kunjaban Officers Quarter Complex	23.863329	91.284528	1	0	1
110	Chittaranjan Road near Ghar Sansar	23.828842	91.286253		0	3
111	Near Gedu Miah Masjid,C.R. Road	23.830012	91.287537		0	3
112	Ramthakur College Complex	23.804401	91.273995		0	3
113	Near CNG Station A.D.Nagar	23.811473	91.270528		0	3
114	Dashamighat Immersion Ground	23.82793	91.264604		0	4
115	IGM Hospital Complex	23.83036	91.275515		1	3

S. No.	Location Name	Latitude	Longitude	PTZ	ANPR	Fixed Box Cameras
116	Back Side of New Raj Bhawan	23.853611	91.284665		0	3
117	G.B. Bazar	23.859422	91.293801		1	3
118	Central Road near Bazar Kolkata	23.828678	91.282651		1	3
119	Infront of Jagannath Temple	23.836271	91.280508		0	4
120	State Museum Complex	23.837332	91.282798		1	3
121	MBB College Complex	23.82715	91.29817		0	3
122	BBMC College Complex	23.825342	91.29292		0	3
123	Santipara	23.829628	91.283811		1	4
124	Junction of Ghosh Patty and Kashari Patty	23.831464	91.286883		1	4
125	Infront of Tulashibati H/S School	23.877593	91.27906		1	4
126	Infront of Budhjung Girls H/S School	23.839575	91.285457		1	4
127	Infront of Shishu Bihar H/S School	23.833066	91.272774		0	3
128	Infront of Netaji H/S School	23.826448	91.279692			4
129	Infront of Bani Vidyapeeth H/S School	23.877593	91.27906			4

S. No.	Location Name	Latitude	Longitude	PTZ	ANPR	Fixed Box Cameras
130	Infront of Kamini Kumar H/S School	23.83271	91.296948			3
131	Infront of Umakanta Academy	23.831499	91.27337			3

13.2. Locations for ANPR Camera

S. No.	Location Name	Latitude	Longitude	No. of Arms	No. of Camera
1.	Airport	23.892742	91.243846	3	3
2.	Amtali	23.772985	91.267441	3	3
3.	Flyover	23.83352	91.291234	3	3
4.	Secretariat	23.863564	91.291618	3	3
5.	Infront of Lichubagan	23.870244	91.284891	6	6
6.	Gurkhabasti	23.854672	91.282271	3	3
7.	North Gate	23.839526	91.282859	4	4
8.	Motor Stand	23.831461	91.286802	4	4
9.	Chanderpur	23.836829	91.305197	3	3
10.	Nagerjala	23.82497	91.267245	3	3
11.	Akhaura	23.836581	91.261548	4	4
12.	Firebrigade	23.832594	91.269308	4	4

13.3. Locations for Emergency Call Box and Public Address System

S. No.	Location Name	Latitude	Longitude
1.	Gurkhabasti	23.854672	91.282271
2.	Postoffice Chowmuhani	23.829673	91.278844
3.	Secretariat	23.863564	91.291618
4.	GB bazar	23.859422	91.293801
5.	Battala	23.828383	91.267140
6.	Old RMS	23.833350	91.278671
7.	Motor Stand	23.831461	91.286802
8.	Infront of Airport	23.892742	91.243846
9.	North Gate	23.839526	91.282859
10.	Radhanagar Bus-stand	23.845006	91.280076
11.	Chandrapur Bus-stand	23.832131	91.293138
12.	Nagerjala	23.824970	91.267245
13.	Kaman Chowmuhani	23.829628	91.283811
14.	Orient Chowmuhani	23.831735	91.280546
15.	Colonel Chowmuhani	23.837603	91.280154
16.	M G Bazar	23.826489	91.285207
17.	Gol Bazar Chittaranjan Road	23.826906	91.283137
18.	Gol Bazar Central Road	23.826907	91.283136

13.4. Locations for Variable Message Display (VMD)

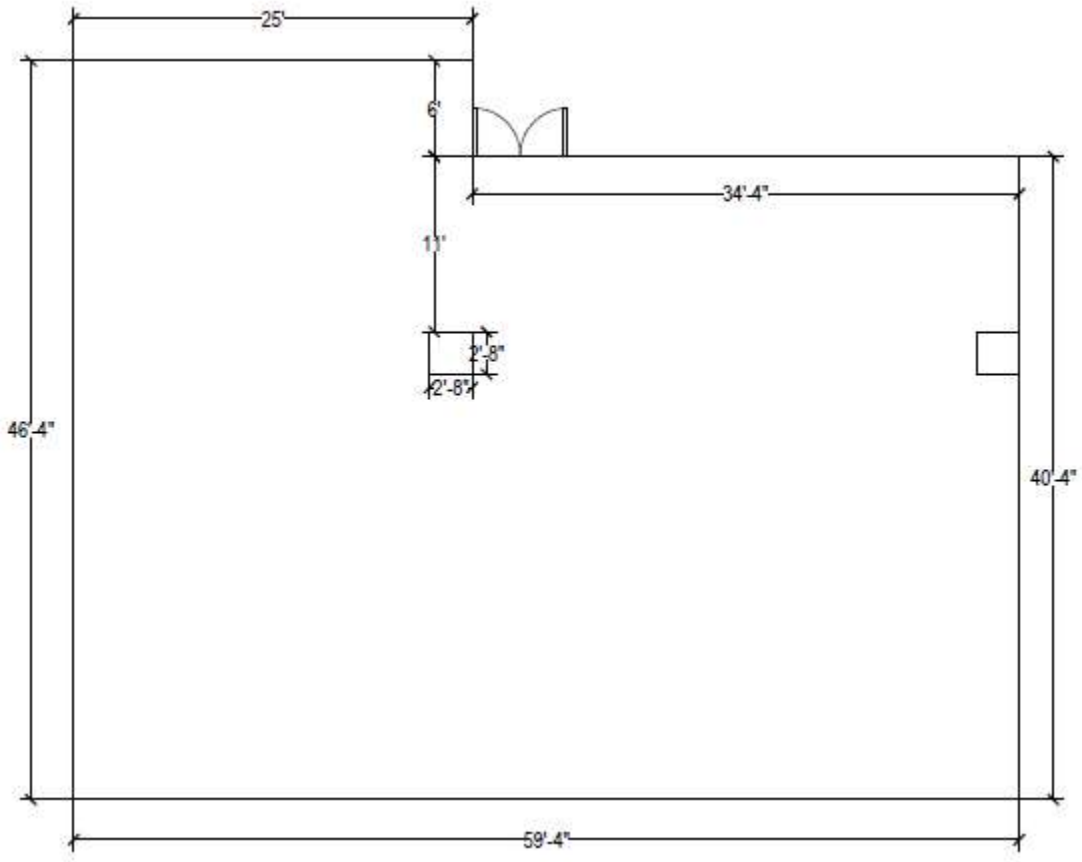
S. No.	Location Name	Latitude	Longitude	Large Size VMS	Small Size VMS
1.	Airport	23.892742	91.243846	1	1
2.	Airport Road	23.892740	91.243842		1
3.	Secretariat	23.863564	91.291618	1	
4.	Radhanagar	23.845006	91.280076		1
5.	North Gate	23.839526	91.282859	1	1
6.	GB Bazar	23.859422	91.293801	1	
7.	Ujjayanta Palace	23.837293	91.282656	1	1
8.	Motor Stand	23.831461	91.286802	1	
9.	Post Office Chowmuhani	23.829424	91.278570		1
10.	City Centre	23.829219	91.274723		1
11.	Battala	23.828383	91.267140	1	
12.	Fire Service	23.832594	91.269308	1	
13.	Flyover	23.833520	91.291234		2
14.	Railway Station	23.792793	91.278423	1	1
15.	Narsingarh Near Stadium	23.902138	91.248496	1	
16.	Chandrapur	23.836830	91.305200	1	
17.	Jail Ashram Road	23.835540	91.293410		
18.	MBB College	23.832107	91.293039	1	1

13.5. Locations for Traffic Signals (Signalization)

S. No.	Location Name	Latitude	Longitude	Arms	ANPR	Fixed Box Camera	PTZ
1.	Ker Chowmuhani	23.83764	91.27024	4	0	4	0
2.	Sankar Chowmuhani	23.83858	91.27031	4	0	4	0
3.	B.K. Chowmuhani	23.834207	91.279776	4	0	4	0
4.	Old RMS	23.83335	91.27867	4	0	4	0
5.	Jackson Gate	23.831736	91.280545	4	0	4	0
6.	Lalbahadur Chowmuhani	23.835867	91.287356	4	0	4	0
7.	Purbassa	23.834451	91.291889	3	0	3	0
8.	Shatadal Sangha(Ashram Chowmuhani)	23.835326	91.30135	3	0	3	0
9.	Khayerpur	23.845349	91.343534	3	0	3	0
10.	Nagerjala	23.82497	91.267245	3	3	3	0
11.	Durga Chowmuhani	23.842743	91.270616	4	0	4	1
12.	Mara Chowmuhani(Bodhjung School)	23.839921	91.285641	4	0	4	0
13.	Siddhi Ashram	23.799606	91.27279	2	0	2	0
14.	Fire Service Chowmuhani	23.815908	91.270847	2	0	2	0

S. No.	Location Name	Latitude	Longitude	Arms	ANPR	Fixed Box Camera	PTZ
15.	Ujjayanta Palace Tri-junction	23.837293	91.282656	3	0	3	0
16.	A.D. Nagar Camper Bazar Tri-Junction	23.816259	91.249398	3	0	3	0
17.	IGM Chowmuhani	23.831098	91.276014	4	0	4	1
18.	Gurkhabasti	23.854672	91.282271	3	6	3	1
19.	Math Chowmuhani	23.831453	91.292341	4	0	4	0
20.	Paradise Chowmuhani	23.829673	91.278844	4	0	4	0
21.	Gunraj Chowmuhani	23.833901	91.286964	4	0	4	0
22.	Orient Chowmuhani	23.831735	91.280546	4	0	4	0
23.	North Gate	23.839526	91.282859	4	5	4	1

13.6. Locations for Integrated Command & Control Center (ICCC)



13.7. Locations for Traffic Enforcement/ Red Light Violation Detection (RLVD) System

S. No.	Location Name	Latitude	Longitude	Total No. of Arms	No. of Arms to be covered	No. of Lanes to be covered
1.	Ker Chowmuhani	23.83764	91.27024	4	4	4
2.	Sankar Chowmuhani	23.83858	91.27031	4	4	4
3.	B.K. Chowmuhani	23.834207	91.279776	4	4	4
4.	Old RMS	23.83335	91.27867	4	4	4
5.	Jackson Gate	23.831736	91.280545	4	4	4
6.	Lalbahadur Chowmuhani	23.835867	91.287356	4	4	4
7.	Purbassa	23.834451	91.291889	3	3	3
8.	Shatadal Sangha(Ashram Chowmuhani)	23.835326	91.30135	3	3	3
9.	Khayerpur	23.845349	91.343534	3	3	3
10.	Nagerjala	23.82497	91.267245	3	3	3
11.	Durga Chowmuhani	23.842743	91.270616	4	4	4
12.	Mara Chowmuhani(Bodhjung School)	23.839921	91.285641	4	4	4
13.	Siddhi Ashram	23.799606	91.27279	2	2	2
14.	Fire Service Chowmuhani	23.815908	91.270847	2	2	2

S. No.	Location Name	Latitude	Longitude	Total No. of Arms	No. of Arms to be covered	No. of Lanes to be covered
15.	Ujjayanta Palace Tri-junction	23.837293	91.282656	3	3	3
16.	A.D. Nagar Camper Bazar Tri-Junction	23.816259	91.249398	3	3	3
17.	IGM Chowmuhani	23.831098	91.276014	4	4	4
18.	Gurkhabasti	23.854672	91.282271	3	3	3
19.	Math Chowmuhani	23.831453	91.292341	4	4	4
20.	Paradise Chowmuhani	23.829673	91.278844	4	4	4
21.	Gunraj Chowmuhani	23.833901	91.286964	4	4	4
22.	Orient Chowmuhani	23.831735	91.280546	4	4	4
23.	North Gate	23.839526	91.282859	4	4	4

13.8. Locations for Intelligent Poles (& Environmental Sensors)

S. No.	Location Name
1.	Main Entrance Zone of Secretariat Complex
2.	Radhanagar Bus Stand area
3.	Chandrapur ISBT
4.	Airport Approach Road
5.	MBB College approach road
6.	Entrance of Government Museum

13.9. Locations for Wi-Fi Access Points

S. No.	Location Name	Type of locations	Approximate Concurrent user
1.	Agartala Airport	Airport	500
2.	Agartala Railway Station	Railway Station	1000
3.	TIT Narsingarh	Educational Institute	500
4.	MBB College	Educational Institute	500
5.	Women's College	Educational Institute	500
6.	Tripura University	Educational Institute	750
7.	ISBT Chandrapur	Bus Stand	500
8.	Radhanagar Bus Stand	Bus Stand	500
9.	IGM Hospital	Hospital	750
10.	GB Hospital	Hospital	750
11.	TMC Hapania	Hospital	750
12.	Akhaura ABD Area	Commercial Area	750
13.	Post Office Chowmuhani	Commercial Area	1000
14.	Secretariat	Secretariat	250
15.	AMC City Centre	Govt. Commercial Area	1000

S. No.	Location Name	Type of locations	Approximate Concurrent user
16.	Jackson Gate/Orient Chowmuhani/Ujjayanta Palace	Commercial Area	1000
17.	BBMC College	Educational Institute	500
18.	Police HQ, FS Chowmuhani	Govt. Office	250
19.	Ramthakur College	Educational Institute	500
20.	Gorkhabasti Office Complex	Govt. Office	250
21.	High Court Tripura	Govt. Office	500
22.	District Court Complex	Govt. Office	500
23.	DM Office Complex	Govt. Office	250

13.10. List of vehicles for Transit Management System

S. No.	Fleet Type	Owner	Approximante Number
1.	Buses	TRTC	173
2.	Electronic Ticketing Machine/ Handheld Ticketing Machine	TRTC	350
3.	Auto Rickshaw	Private	8000
4.	Ambulances	AMC	7

13.11. Locations for Bus Shelters for LED PIS Display

S. No.	Location Name	Latitude	Longitude
1.	LichuBagan (Mukut Bitani Bagan)	23.870244	91.284891
2.	Durjoynagar Holly Cross	23.877593	91.279060
3.	Nutannagar	23.886040	91.262629
4.	Usha Bazar	23.886196	91.243385
5.	Airport	23.892742	91.243846
6.	Narayanpur	23.899807	91.245710
7.	Police Training College	23.905418	91.256614
8.	Durga Chowmuhani	23.842743	91.270616
9.	South Badarghat	23.802689	91.272254
10.	Hapania (Near ONGC Complex)	23.790772	91.272945
11.	Amtali Bazar	23.779982	91.276587
12.	Kalyani	23.830370	91.296628
13.	Rashom Bagan	23.844006	91.310777
14.	Kashipur	23.843155	91.323425
15.	Trinath Temple	23.820606	91.287735

S. No.	Location Name	Latitude	Longitude
16.	Kheyerpur	23.845349	91.343534
17.	Near Indranagar Kali Bari	23.839934	91.306112
18.	Infront of ITI	23.849766	91.300585
19.	GB Bazar	23.859422	91.293801
20.	Nagarjala Depot	23.824970	91.267245
21.	Radhanagar Depot	23.845006	91.280076
22.	ISBT Depot	23.839533	91.306600
23.	Kashipur	23.843155	91.323425
24.	Bankumari	23.865706	91.304742
25.	Battala	23.828383	91.267140
26.	Drop Gate(East Side)	23.818036	91.271501
27.	Infront of Kunjaban Bipani Bitan (Near Circuit House)	23.851165	91.283301
28.	Opposite Circuit House	23.851165	91.283303
29.	Near Heritage Park	23.856545	91.284911
30.	Opposite of Heritage Park	23.856541	91.284909
31.	Gurkhabasti	23.854672	91.282271

S. No.	Location Name	Latitude	Longitude
32.	Near High Court	23.868536	91.285733
33.	LichuBagan (Infront of Mukut Bipani Bagan)	23.870244	91.284891
34.	Opposite of Mukut Biapani Bagan	23.855934	91.282079
35.	TIT Narshingarh	23.906388	91.248040
36.	College Tilla, Opposite Housing Apartment	23.826857	91.294371
37.	Bijoy Kumar School	23.837897	91.274285
38.	Colonel Chowmuhani	23.837603	91.280154
39.	Infront of UK Academy School	23.831499	91.273370
40.	Badarghat near Doordarshan	23.809622	91.271236
41.	Drop Gate(West Side)	23.818046	91.271518
42.	Akhaura Road near Golchakkar	23.837595	91.258420
43.	Jogendra Nagar Bridge	23.822505	91.296938
44.	North Gate Opposite to Vivekananad Maidan	23.839750	91.282740
45.	Aralia	23.827638	91.311982
46.	Pragati School	23.843524	91.274680
47.	Sakuntala Road Near Gate of Children's Park	23.833743	91.282107
48.	Near Sadhutilla School	23.808978	91.296361

13.12. Locations for Digital Information Kiosk

S. No.	Location Name
1.	Agartala Railway Station
2.	Airport
3.	City Centre
4.	Firebrigade Chowmuhani
5.	GB Bazar
6.	GB Hospital
7.	IGM Hospital
8.	ISBT
9.	Ashram chowmuhani
10.	MBB College
11.	Nagerjala Bus Stand
12.	North Gate
13.	Old Motor Stand
14.	Post Office Chowmuhani
15.	Rabindra Bhavan
16.	Radhanagar Bus Stand
17.	Secretariat
18.	TMC Hapania
19.	Battala
20.	Purbasha
21.	AMC-G Floor
22.	Jaganath Temple
23.	RamaKrishna (Joy Guru)
24.	Satsang Krishna Nagar
25.	Buddha Mandir
26.	LokNath Temple (Women's College)

REQUEST FOR PROPOSAL

FOR

SELECTION OF MASTER SYSTEM INTEGRATOR FOR IMPLEMENTATION OF INTEGRATED COMMAND & CONTROL CENTER AND SMART ELEMENTS IN AGARTALA CITY

Volume 3 – Master Service Agreement
RFP Number: ASCL/RFP/04/06
Date: 19th April 2018

Invited by:

Agartala Smart City Limited (ASCL)
5th Floor, Agartala Municipal Corporation,
Paradise Chowmuhani,
Agartala - 799001

Table of Contents

PREAMBLE

This RFP document comprises of the following three parts:

Part A: General Conditions of the Contract
Part B: Special Conditions of the Contract
Part C: Service Levels

Part A: General Conditions of the Contract

This part comprises of the general conditions which will govern the Contract to be executed between the MSI and the Agartala Smart City Limited.

Part B: Special Conditions of the Contract

This part comprises of the special conditions which will govern the Contract to be executed between the MSI and the Agartala Smart City Limited.

Part C: Service Levels

This part comprises of the general procedures with respect to the service level agreements, reporting, issue management, service level change control etc.

A. PART A – GENERAL CONDITIONS OF CONTRACT

1. Definition of Terms

In this RFP, the following words and expressions shall, unless repugnant to the context or meaning thereof, have the meanings hereinafter respectively assigned to them:

1.1. **"Acceptance of System"** means the System, including the hardware, software, solution or any Deliverable accepted or deemed to have been accepted by the Authority, subsequent to its installation, rollout and deployment of trained manpower, when all the activities as defined in Scope of Work have been successfully executed and completed to the satisfaction of Authority and the Authority has given its acceptance by signing the Acceptance Certificate. For further details, refer to Section 5 & 7 of the RFP Volume II;

1.2. **"Acceptance Certificate"**- means that document/certificate issued by the Authority signifying acceptance of a hardware, software, solution, or any other Deliverable pursuant to the successful completion of the Acceptance Test of the System;

1.3. **"Acceptance Test" or "User Acceptance Test"** - means the test, standard procedure, trial runs to be conducted by the MSI as per this RFP or as per Contract in relation to the Works.

1.4. **"Affiliate(s)"** means, with respect to any Person, any other Person, directly or indirectly controlled by, controlling or under common control with such Person. For purposes of this Agreement, the term "control" means the power to direct the management and policies of a Person, whether through the ownership of voting securities, by agreement or otherwise. An Affiliate shall remain an Affiliate only as long as such control exists.

1.5. **"Agreement"** means this Master Service Agreement including the Annexures hereto and any amendments thereto made in accordance with the provisions contained in this Agreement and includes the documents specified in Clause 3.7 hereinafter;

1.6. **"Applicable Law(s)"**means all laws in force and effect as of the date hereof and/or laws which may be promulgated or brought into force and effect after the date of execution of the Agreement and includes any statute, law, ordinance, notification, rule, regulation, judgment, order, decree, injunctions, by-laws, approval, directive, guideline, policy, requirement or other governmental restriction or any similar form of decision applicable to the relevant Party and all judgments, decrees, injunctions, and orders of any court, tribunal or any quasi-judicial authority, as may be in force and effect during the subsistence of the Project;

1.7. **"Applicable Permits" / "Approvals"** means all clearances, licenses, permits, authorizations, no objection certificates, consents, approvals and exemptions under or pursuant to any of the Applicable Laws or from any Government Agency or third party, required to be obtained and/or maintained by the MSI or it's Sub Contractor(s)in order to implement the Project and for undertaking, performing or discharging the obligations contemplated under the Agreement, including but not limited to clearances required for importing equipment, exemption of tax/duties/levies/work permits/clearances for MSI/MSI's Team;

1.8. **"Approved Plan"** shall mean the approval given by the Authority to the plan submitted by the MSI for executing the Works under the Contract.

1.9. **"Authority"/ "ASCL"** means the Agartala Smart City Limited. The Project shall be executed in Agartala and shall be owned by Agartala Smart City Limited.

1.10. **"Bank Guarantee"** means an irrevocable and unconditional bank guarantee payable on demand and issued by a bank in favor of the Authority and furnished by the MSI or its Sub Contractor(s) to Authority for guaranteeing the due performance of its obligations under the Agreement;

1.11. **"Bid**" means the documents in their entirety comprised in the bid submitted by the Bidder in response to this RFP No. [_____] dated 18th April 2018;

1.12. **"Bidder"** shall mean Person, organization or consortium submitting the proposal in response to this RFP;

1.13. **"Business Day"** means the working day in the city of Agartala.

1.14. **"Change Control Note"** shall have the meaning as set forth under Clause and in the format specified under Annexure I of this RFP.

1.15. **"Commercial Off-The-Shelf (COTS)"** refers to software products that are ready-made and available for sale, lease, or license to the general public;

1.16. **"Conditions Precedent"** shall have the meaning set forth in Clause [3] of this RFP;

1.17. **"Confidential Information"** means all information including any information (whether in written, oral, electronic or other format) which relates to the technical, financial and business affairs, dealers, suppliers, products, developments, operations, processes, data, trade secrets, design rights, know-how, plans, budgets and information and data which is proprietary to ASCL and which is disclosed to or otherwise learned by MSI in the course of or in connection with the Contract but does not include information (i) which is available lawfully in the public domain; (ii) publicly known through no fault of the MSI; (iii) already known to the MSI from someone other than the Authority who is not bound by confidentiality restrictions; or (iv) independently developed by the MSI without access to or use of the Confidential Information disclosed.

1.18. **"Consortium"** means a group of Persons/entities who have jointly formed a consortium for submitting a joint bid/proposal in accordance with this RFP for the Project. The Consortium shall be represented/headed by a Prime Bidder and shall be the entity/Person named in the Contract for any part of the Work and/or who has been sublet with the consent in writing of the Authority and shall include it's successors, representatives (approved by ASCL), heirs, executors, administrators and permitted assigns, as the case may be, unless excluded by the terms of the Contract

1.19. **"Consortium Member(s)"** means each entity/member who have come together to form the consortium for the purposes of submitting a joint bid in response to this RFP;

1.20. **"Contract"** means the contract entered into by the Parties for executing and implementing the Works/Project as envisaged in the present RFP and includes (a) the complete RFP documents being Volumes I, II and III of the RFP and Corrigendum and addendum, (b) MSI's offer, (c) letter of acceptance or letter of award or letter of intent

issued by the Authority, (d) the acceptance of letter of award from MSI, (e) notice to proceed with the Work, and (f) any other document listed in the Contract data;

1.21. **"Contract Value"** means the amount quoted by the MSI in its commercial Bid and which has been duly accepted by ASCL for the full and proper performance of its obligations under the Contract;

1.22. "**Date Center"/"DC"/"Data Center Site"/"DC Site"/ "Server Room"** means the data center sites including their respective data center space, wherein the delivery, installation, integration, management and maintenance services as specified under the Scope of Work are to be carried out for the purpose of this Contract. The DC Site will be located at State Data Centre.

1.23. **"Deliverable(s)"** shall mean all of the equipment, sub-systems, hardware, software, products accessories, software, source code, documentation, reports and/or other material/items which MSI is required to supply, install and maintain under the scope of the contract.

1.24. **"Developed Materials"** shall have the meaning ascribed to it in Clause 27.3;

1.25. **"Document"** means any embodiment of any text or image however recorded and includes any data, text, images, sound, voice, codes, databases or any other electronic documents /records as contemplated as per Information Technology Act 2000 and the rules framed under the said Act;

1.26. **"Effective Date"** means the date on which the Contract is signed or letter of intent is issued by Authority, whichever is earlier and executed by the Parties hereto. If the Contract is executed in parts, then the date on which the last of such Contracts is executed shall be construed to be the Effective Date;

1.27. **"Fixes"** means product fixes that are either released generally (such as commercial product service packs) or that are provided to MSI or their Subcontractor when performing services (such as workarounds, patches, bug fixes, beta fixes and beta builds) and any derivatives of the foregoing.

1.28. **"Force Majeure" or "Force Majeure Event"** shall have the meaning set forth in as per Clause [21●];

1.29. **"Goods"** means all of the equipment, sub-systems, hardware, software, products accessories, components, software and/or other material/items and includes their user manuals, technical manuals, operating manuals, service mechanisms, policies and guidelines (such as security related, data migration related) and all its modifications which MSI is required to supply, install and maintain under the Contract;

1.30. **"Good Industry Practice"** means the practices, methods, techniques, designs, standards, skills, diligence, procedure, efficiency, reliability and prudence which would reasonably and ordinarily be expected from a skilled and experienced contractor engaged in activities of a similar scope and complexity to those that are the subject of the Contract and as envisaged under this RFP and under the same or similar circumstances, where such contractor is seeking to comply with its contractual obligations and all Applicable Laws and regulatory requirements. It would include good engineering practices in the design, engineering, construction and project management and acting generally in accordance with the provisions of this RFP and

would include which would be expected to result in the performance of its obligations by the MSI in accordance with the Contract, this RFP, Applicable Laws and Applicable Permits in reliable, safe, environment protected, economical and efficient manner;

1.31. **"Go- Live"** means installation, testing, commissioning of Project, and commencement of all smart city components, including training as per Scope of Work mentioned in the Contract or this RFP. MSI should have the approval from Authority for carrying out User Acceptance Test.;

1.32. "**Government Instrumentality" / "Government Agency"/ "Government Authority"** means any department, division or sub-division of the Government of India or the Government of Agartala or any other State Government, including but not limited to the Agartala Municipal Corporation, Agartala Urban Development Authority, Agartala Smart City Corporation Limited, as may be applicable, including any commission, board, body, bureau, authority, agency, instrumentality, court or other judicial or quasi-judicial or administrative body, at central, state or local level, or municipal and other local authority or statutory body including Panchayat under the control of the Government of India or the Government of Agartala, as the case may be, and having jurisdiction over the MSI, MSI's Sub Contractor the Project or any portion thereof or the performance of all or any of the Services or obligations of the MSI or MSI's Sub Contractor under or pursuant to this RFP or under the Contract;

1.33. **"Integrated Command and Control Center" OR "ICCC"** means the integrated/centralized operation center as contemplated under this RFP to implement holistic and integrated solution for multiple (existing and future) IT initiative for ASCL. The IT initiative may be of any department approved by ASCL, such as Agartala Municipal Corporation/Agartala Police department or any other authority/body which would conduct inter-alia activities like traffic, surveillance on security and civil issues through IOT based network on the entire Agartala Smart City;

1.34. **"Intellectual Property Rights"** means all rights pertaining to patent, trademarks, copyrights, trade secrets, service marks, logos, brands, trade names, internet domain names, formulae, designs, software (whether in object code or source code), know-how, processes, techniques, methods, technical data, databases, proprietary information, utility models, rights in know- how and other intellectual property rights, whether existing as of the Effective Date or arising thereafter, and all of the goodwill associated with the use of, and symbolized by, any of the foregoing, all rights of indemnification with respect to any of the foregoing, the right to prosecute and sue for past, present and future infringements, dilutions, violations or misappropriations with respect to any of the foregoing, all rights corresponding to any of the foregoing throughout the world, and all proceeds of any the foregoing, including licenses, royalties and proceeds of suit, and any right to any of the foregoing granted under any License.

1.35. **"Key Personnel"** means employees of MSI whether employed directly on rolls of MSI or engaged indirectly, providing services to MSI through a contractor and the key personnel of MSI as referred in Section 3.6.3 of the RFP Volume I proposed.

1.36. **"Milestone" or "Project Timeline(s)":** means the stipulated time period fixed under the Contract or under the RFP for completion of Works or part of the Works by the MSI.

1.37. **"MSI"** shall mean the successful bidder (Person, organization, Consortium) who is selected by the Authority at the end of the RFP process for execution of the Project and shall be deemed to include the MSI's successors, agent(s), agency, representatives (approved by ASCL), heirs, Affiliates, executors, administrators and permitted assigns, as the case may be, unless excluded by the terms of the Contract.

1.38. **"MSI's Team"** means the team established/formed by MSI for executing the Works under the present RFP and the Contract and shall include any and/or all of the employees of MSI, agent(s), agency, authorized service providers/partners and representatives or other Personnel employed or engaged either directly or indirectly by MSI for the purposes of the Contract;

1.39. **"Notice"** means a written notice, consent, approval or other communication required to be sent to the parties under the Contract;

1.40. **"OEM"** means the original equipment manufacturer of any equipment/system/software/product who is/are providing such Goods to the Authority under the scope of this RFP or the Contract;

1.41. **"O & M":** shall mean operation and maintenance.

1.42. **"Person"** includes any individual, company, corporation, partnership, joint venture, trust, unincorporated organization, government or Governmental Authority or Government Agency or any other legal entity;

1.43. **"Performance Bank Guarantee"/"PBG"** means performance bank guarantee as defined under Annexure 5 (A) of the RFP Volume I

1.44. **"Prime Bidder"** means the member of the Consortium who is heading/representing the Consortium and who shall bid on behalf of the Consortium and represent the Consortium before the Authority and shall act as the interface between the Consortium and the Authority

1.45. **"Project"** means the project of implementation of ICCC in Agartala City by the MSI or by its Sub Contractor(s) in pursuance of the terms and conditions of this RFP/Contract.

1.46. **"Project Location(s)"** shall mean the location(s)/ site(s) where the Works are to be executed by the MSI.

1.47. **"Project Manager"/ "Authority's Representative"** shall mean the person appointed by the Authority for supervising and managing the affairs in relation to the Project.

1.48. **"Project Office"** means the site office to be set up by the MSI for the execution of the Project. The Project office shall be set up by the MSI at a location to be suggested by the Authority;

1.49. **"Project Report(s)"** shall mean the report(s) or the updates to be submitted by the MSI in relation to the Works at regular intervals;

1.50. **"Project Team"** means the MSI's Key Personnel, team members or any other person duly authorized by the Authority for the execution of the Works and the Project.

1.51. **"Project Plan" or "Plan" or "Revised Plan" or "Work Plan" or "Program of Work(s)":** means the plan/ schedule, methodology, design documents, specifications, or any other document submitted by the MSI to the Authority for executing the Works under the Contract or for the fulfillment of its various obligations under the Contract.

1.52. **"Replacement Service Provider"** means the organization or agency replacing MSI or its Sub Contractor in case of termination of the Contract for any reasons whatsoever;

1.53. **"RFP"** means this Request for Proposal for the selection of MSI for implementation of the Project;

1.54. **"Scope of Work"** shall have the meaning as set forth in Clause [4.] of this RFP;

1.55. **"Service Levels":** shall mean the level of service to be provided/rendered by MSI for executing/completing the Works and for meeting it's various obligations under the Contract and shall include the meaning set forth in Part C of this RFP;

1.56. **"Service(s)" or "Activity" or "Activities" :** shall means the Works/Services to be carried out or rendered by the MSI and or its Sub Contractor pursuant to this RFP and the Contract or any other specific assignment awarded by the Authority to MSI;

1.57. **"Service Specifications"** shall mean the specifications as set out in PART C-SERVICE LEVELS of this RFP;

1.58. **"Schedule of Requirements" or "Scheduled Requirement(s)" or "Schedule Requirement(s)**: shall have the meaning as set forth under_____;

1.59. **"Steering Committee" or "High Powered Committee" or "Project Information Committee"** shall mean a committee formed to supervise/monitor the work of the Project Management Committee and also the Project Manager. It shall consist of ___ number of members and shall act as the appellate body over the decision rendered by the Project Management Committee;

1.60. **"Sub-Contractor"** shall mean the entity or agency working on behalf of MSI and who is named in the Contract for any part of the Scope of Work or any Person to whom any part of the Contract has been sublet with the consent in writing by the Authority and shall include the heirs, legal representatives, successors and assignees of such Person;

1.61. **"Work(s)" or "Program of Work(s)"** means the entire work or a part of it to be undertaken by MSI for implementation of the ICCC Project in Agartala City as envisaged in the present RFP and the Contract together with all Annexures, Schedules, referenced documents and all amendments, corrigendum, addendums and changes thereto.

2. Interpretation

2.1 **In this RFP unless a contrary intention is evident:**

a. "Party" shall mean MSI or ASCL individually and "Parties" shall mean MSI and ASCL collectively;

b. the clause headings are for convenient reference only and do not form part of the Contract;

c. unless otherwise specified a reference to a clause number is a reference to all of its sub-clauses;

d. the word "include" or "including" shall be deemed to be followed by "without limitation" or "but not limited to" whether or not they are followed by such phrases;

e. unless otherwise specified a reference to a clause, sub-clause or section is a reference to a clause, sub-clause or section of the Contract including any amendments or modifications to the same from time to time;

f. a word in the singular includes the plural and a word in the plural includes the singular;

g. a word importing a gender includes any other gender;

h. a reference to a person includes a partnership and a body corporate;

i. a reference to legislation includes legislation repealing, replacing or amending that legislation;

j. Where a word or phrase is given a particular meaning it includes the appropriate grammatical forms of that word or phrase which have corresponding meanings.

k. In the event of an inconsistency between the terms of the Contract and the RFP and the Bid, the terms of the RFP shall prevail.

l. In case there is a contradiction between the clauses mentioned in the RFP, the below hierarchy of clauses in order of precedence shall be applicable:

i. Pre-bid clarification and Corrigendum, if any

ii. Volume III of RFP

iii. Section 4 and 6 of RFP volume II

iv. Annexures of RFP volume II

v. RFP volume I

3. Conditions Precedent

3.1 The payment and other obligations of ASCL under the Contract shall take effect upon fulfillment of the following conditions precedent by MSI:

3.1.1 Furnishing by MSI, an unconditional and irrevocable Performance Bank Guarantee (PBG) as per (Annexure 5 (A) of the RFP Volume I) from a nationalized bank and in a form and manner which is acceptable to the

Authority, which would remain valid until such time as stipulated by the Authority;

3.1.2 Obtaining of all statutory Approvals and Permits required for the performance of the Services under the Contract; This may include Approvals/clearances, wherever applicable, that may be required for execution of the Contract e.g. clearances from Government authorities for importing equipment, exemption of tax/duties/levies, work permits/clearances for Bidder/Bidder's team, etc.

3.1.3 Furnishing by MSI, the notarized copies of any/all contract(s) duly executed by MSI and its OEMs existing at the time of signing of the Contract in relation to the Project. Failure to do so within stipulated time of signing of Contract would attract penalty

3.1.4 Furnishing of such other documents by MSI as the Authority may specify/demand.

3.2 The Authority reserves the right to waive any or all of the conditions specified in Clause 3.1 above in writing and no such waiver shall affect or impair any right, power or remedy that the Authority may otherwise have.

3.3 In the event that any of the conditions set forth in Clause 3.1 hereinabove are not fulfilled within 1(one) month from the date of the Contract, or such later date as may be mutually agreed upon by the Parties, the Authority may terminate the Contract and upon such termination, MSI shall have no right to claim any damages from the Authority on such account.

4. Scope of work

4.1 The Scope of the Work under the Contract shall be as defined in RFP Volume II and Annexures thereto of the said RFP.

4.2 The Authority has engaged MSI to provide services related to implementation of ICCC in Agartala City, using which the Authority intends to perform its business operations. MSI with prior written approval of the Authority would have the right to appoint a Sub Contractor for subcontracting any part of the Works/Services to such nominated Subcontractor. The Sub Contractor to be appointed and the subcontract shall be in a form and manner acceptable to the Authority. The Subcontractor shall fully abide by the terms and conditions of the Contract. It is a fundamental term of the Contract that appointment of a Sub Contractor would not absolve MSI of any obligations to be performed by the Sub Contractor under the Contract, and MSI shall be responsible for all acts of the Sub Contractor and indemnify the Authority for losses, damages, claims suffered by the Authority due to any acts of omission and commission by the Sub Contractor while performing its obligations under the subcontract.

4.3 In addition to the above scope of work mentioned in Clause 4.1 of this RFP, Authority may require MSI to provide such Goods, Products, Services and support as the Authority may deem fit and proper and necessary, during the Term of the Contract, and may include all such processes and activities which are consistent with the proposals set forth in the Bid, the Tender and the Contract and are deemed necessary by the Authority, in order to meet its business requirements related to the Project.

5. Key Performance Measurements

5.1 Unless specified by the Authority to the contrary, MSI shall deliver the Goods, perform the Services and carry out the Scope of Work in accordance with the terms of the RFP and the Contract.

5.2 If the Contract, Scheduled Requirements, Service Specification includes more than one Document, then unless the Authority specifies to the contrary, the later in time shall prevail over a Document of earlier date to the extent of any inconsistency.

5.3 The Authority reserves the right to amend any of the terms and conditions in relation to the RFP/Contract/Service Specifications/Scheduled Requirements and may issue any such directions which are not necessarily stipulated therein, if it deems necessary for the fulfilment of the Schedule of Requirements.

6. Commencement and Progress

6.1 Subject to the fulfillment of the Conditions Precedent under Clause 3.1 above, MSI shall commence the performance of its obligations in a manner as per the Scope of Work specified under Clause 4 above.

6.2 MSI shall proceed to carry out the Activities/Services with diligence and efficiently in accordance with any stipulation as to the time, manner, mode, and method of execution contained in the Contract.

6.3 MSI shall be responsible for and shall ensure that all Activities/Services are performed in accordance with the Contract, Scope of Work, Scheduled Requirements and Service Specifications and that MSI's Team complies with such Service Specifications and all other standards, terms and other stipulations/conditions set out in this RFP and or the Contract.

7. Standards of Performance

7.1 MSI shall perform the Activities/Services and carry out its obligations under the Contract with due diligence and in accordance with Good Industry Practices. MSI shall employ appropriate advanced technology and engineering practices, shall maintain high safety standards, safe and effective equipment, machinery, material and methods and shall always act, in respect of any matter relating to this Contract, as faithful advisors to the Authority and shall, at all times, support and safeguard the Authority's interests in any dealings with third parties.

8. Approvals and Required Consents

8.1 The Authority shall extend all necessary support to MSI to obtain, maintain and observe all Applicable Permits/Approvals as may be necessary for MSI to fulfill all its obligations under the Contract and/or for providing Goods and Services to the Authority. The costs of such Applicable Permits/Approvals shall be solely borne by MSI. Authority shall provide all reasonable co-operation, support and information available with it for obtaining such Approvals.

8.2 In the event, despite the support provided by the Authority, the Applicable Permit/Approval could not be obtained by MSI, MSI and the Authority shall discuss and co-operate with one another for achieving a reasonable alternative arrangement at the earliest, so that there is minimal disruption of Work or business operations, until such Approval(s) is/are obtained. However, if for any reason, no alternative arrangement could be achieved, Parties shall mutually decide the further course of action, however, until then, MSI shall not be relieved of its obligations to provide the Services and to achieve the Service Levels.

9. Constitution of Consortium

9.1 A group of Persons/entities may form a Consortium for submitting a bid under the present RFP. The Consortium shall be headed and represented through a Prime Bidder who shall act as the interface between the Consortium and the Authority. Unless the Authority deems fit and the Contract requires otherwise Prime Bidder shall be solely and absolutely accountable to the Authority for the performance of all obligations under the Contract.

9.2 The Consortium Members have agreed that Prime Bidder is the prime point of contact between the Consortium Members and the Authority and it shall be primarily responsible for the discharge and administration of all the obligations contained herein. The Authority, unless it deems necessary shall deal only with the Prime Bidder. However, the Prime Bidder along with the other members of the Consortium shall remain jointly and severally liable/responsible under the Contract for fulfilling all obligations.

9.3 Without prejudice to the obligation of the Consortium Members to adhere to and comply with the terms of the Contract, the Consortium Members have executed and submitted a power of attorney in favor of the Prime Bidder authorizing him to act for and on behalf of such members of the Consortium and to do all acts as may be necessary for fulfillment of obligations under the Contract.

9.4 The Authority reserves the right to review, approve and require amendment of the terms of the Consortium contract or any contract or agreements entered into by and between the members of such Consortium and or between new members of such consortium and no such agreement/contract shall be executed, amended, modified and/or terminated without the prior written consent of the Authority. An executed copy of each of such agreements/contracts shall, immediately upon execution be submitted by the Prime Bidder to the Authority.

9.5 Where, during the term of the Contract, Prime Bidder terminates any contract/arrangement or agreement relating to the performance of Services, Prime Bidder shall be responsible and severally liable for any consequences resulting from such termination. Prime Bidder shall in such case ensure the smooth continuation of Services by providing a suitable replacement to the satisfaction of the Authority at no additional charge and at the earliest opportunity.

10. MSI's Obligations

10.1 MSI's obligations shall include performance of all the Services as specified in the Scope of Work under Clause 4 of this RFP and also under the other clauses of the RFP (Volume I, II and III), the Contract and any amendments/changes thereof to enable the Authority to meet the objectives and operational requirements in the Contract. It shall be MSI's responsibility to ensure the proper and successful implementation, performance and continued operation of the proposed solution in accordance with and in strict adherence to the terms of its Bid, the RFP and the Contract. In addition to the aforementioned, MSI shall provide Services to manage and maintain the said system and infrastructure as mentioned in RFP Volume II.

10.2 MSI shall ensure that the Services are performed through the efforts of MSI's Team/Key Personnel and are in accordance with the terms hereof and to the satisfaction of the Authority. Nothing in this RFP or the Contract will relieve MSI from its liabilities or obligations under the RFP or the Contract to provide the Services in accordance with the Authority's directions and requirements and as stated in the Contract and the Bid to the extent acceptable by the Authority and MSI shall be liable for any non-performance, non-compliance, breach or other loss and damage resulting either directly or indirectly by or on account of its team.

10.3 MSI shall be fully responsible for deployment/installation/development and integration of all the software and hardware components and for resolving any problems/issues that may arise due to integration of components.

10.4 In addition to the aforementioned, MSI shall provide Services to manage and maintain the said system and infrastructure as mentioned in Section 1 of RFP Volume II.

11. Selection of MSI's Key Personnel:

11.1 MSI shall ensure that MSI's Team/Key Personnel is/are competent, professional and possesses the requisite qualifications, skills and experience appropriate to the task they are required to perform under the Contract.

11.2 The Authority reserves the right to interview and reject, if found unsuitable, the Key Personnel proposed by MSI that shall be deployed as part of the Project team. .

11.3 MSI shall submit profiles of only those Key Personnel who are to be deployed on the Project.

12. Changes in MSI's Key Personnel:

12.1 The Authority reserves the right to require changes in MSI's Key Personnel, which shall be communicated to MSI.

12.2 With the prior approval of the Authority, MSI may make additions to the Project team. MSI shall provide the Authority with the resume of the proposed Key Personnel and provide such other information as the Authority may reasonably require.

12.3 In case of change in MSI's Key Personnel/team members, for any reason whatsoever, MSI shall also ensure that the exiting team members are replaced with at least equally qualified and professionally competent members.

12.4 In case of change in its team members and for ensuring a smooth transition between an outgoing team members with a new team member, MSI shall ensure a reasonable amount of time overlap in activities to ensure proper knowledge transfer and handover/takeover of documents and other relevant materials between the outgoing and the new member.

13. Exit of MSI's Key Personnel:

13.1 MSI shall ensure that none of the Key Personnel and manpower exit from the Project during the first 6 (six) months of the beginning of the Project. In cases where such exit is unavoidable, MSI shall replace such Key Personnel and manpower with a suitable replacement with prior written approval from the Authority. In case the Authority is not satisfied with the replacement provided, MSI shall have to compensate the Authority by paying a compensation of INR 2 lacs per such replacement

14. Services provided by OEMs:

14.1 MSI shall ensure that the OEMs supply all Goods, including associated accessories and software required for the execution of the Works and shall support MSI in the installation, commissioning, integration and maintenance of these components during the entire period of Contract.

14.2 MSI shall ensure that the COTS supplied by the OEMs support MSI in the installation/deployment, integration, roll-out and maintenance of the software applications during the entire period of Contract. It must clearly be understood by MSI that warranty and O & M of the System, Products and Services incorporated as part of System would commence from the day of Go-Live of the respective phase including all the solutions proposed.

14.3 MSI would be required to explicitly display that it/they have a back to back arrangement for provisioning of warranty/O&M support till the end of Contract period with the relevant OEMs. The annual maintenance support shall include patches and updates of the software, hardware components and other devices.

15. Software, Licenses obtained by MSI

15.1 All the software licenses that MSI proposes to obtain or use for the purposes of fulfilling its various obligations under the Contract have to be genuine and should be perpetual in nature. The software licenses shall not be pirated or restricted based on location and the Authority should have the flexibility to use them for other requirements if necessary. All Applicable Permits/Approvals/software licenses shall be obtained by MSI in the name of Authority only unless the Authority expressly agrees to give its consent in writing to do otherwise..

15.2 All the OEMs that MSI proposes should have dealer possession licenses.

15.3 The Authority reserves the right to review the terms of the warranty and annual maintenance agreements entered into between MSI and OEMs and no such agreement/contract shall be executed, amended, modified and/or terminated without the prior written consent of the Authority. An executed copy of each of such agreements/contracts shall, immediately upon execution be submitted by MSI to the Authority.

15.4 MSI shall ensure that none of the components and sub-components is declared end-of-sale or end-of-support by the respective OEM at the time of submission of Bid. If the OEM declares any of the products/solutions end-of-sale subsequently, the MSI shall ensure that the same is supported by the respective OEM for Contract period.

15.5 If a product is de-supported by the OEM for any reason whatsoever, from the date of Acceptance of System till the end of Contract, MSI shall replace the products/solutions with an alternate that is acceptable to the Authority at no additional cost to the Authority and without causing any performance degradation.

15.6 MSI shall ensure that the OEMs provide the support and assistance to MSI in case of any problems/issues arising due to integration of components supplied by it with any other component(s)/product(s) under the purview of the overall solution. If the same is not resolved for any reason whatsoever, MSI shall replace the required component(s) with an equivalent or better substitute that is acceptable to Authority without any additional cost to the Authority and without impacting the performance of the solution in any manner whatsoever.

15.7 MSI shall ensure that the OEMs shall provide for all hardware servers/equipment supply and/or installation of all types, updates, patches, fixes and/or bug fixes for the firmware or software from time to time at no additional cost to the Authority.

15.8 MSI shall ensure that the OEMs for hardware servers/equipment or Bidders trained engineers conduct the preventive maintenance on a quarterly basis and break-fix maintenance in accordance with the Good Industry Practices. MSI shall ensure that the documentation and training services associated with the components shall be provided by the OEM partner or OEM's certified training partner without any additional cost to the Authority. The training mentioned in clause 13.8 above shall be conducted using official OEM course curriculum, mapped with the hardware/software product(s) to be implemented in the Project.

15.9 MSI and their Personnel/representative shall not alter/change/replace any hardware component proprietary to the Authority and/or under warranty or during operation and maintenance of third party without prior consent of the Authority.

15.10 MSI shall keep and provide the required critical spares/components at the designated Data Center Sites/Project locations/office locations of the Authority (Collectively "Facilities") for meeting any unforeseen eventuality and for ensuring the various compliances and obligations under the Contract.

16. Powers of MSI's representative(s)/Key Personnel:

16.1 MSI's representative(s) shall have all the powers requisite for the execution of Scope of Work and performance of Services under the Contract. MSI's representative(s) shall

liaise with the Authority's representative for the proper coordination and timely completion of the Works and on any other matters pertaining to the Works.

16.2 MSI's representative(s) shall extend full co-operation to Authority's representative in the manner required by them for supervision/inspection/observation of the equipment/goods/material, procedures, performance, progress, reports and records pertaining to the works. MSI shall also have complete charge of MSI's Team engaged in the performance of the Works and to ensure compliance of rules, regulations and safety practice. MSI's representative(s) shall also cooperate with the other service providers/vendors of the Authority working at the Authority's office locations & field locations and DC Site. Such MSI's representative(s) shall be available to the Authority's Representative at respective Data Center during the execution of Works.

16.3 MSI shall be responsible on an ongoing basis for coordination with other vendors and agencies of the Authority in order to resolve issues and oversee implementation of the same. MSI shall also be responsible for resolving conflicts between vendors in case of borderline integration issues.

17. Setting up of Project Office:

17.1 MSI shall set up a Project Office at the location to be suggested by the Authority. The technical manpower deployed on and necessary at the Project Office for the execution of the Works shall work from the said Project Office. However, some work may be carried out by MSI from its other offices during the Contract period.

18. Access to Data Center Site

18.1 Data Center Site would include Data Center's Server Room and ICCC.

18.2 The Authority's representative upon receipt of request from MSI intimating commencement of activities at various locations shall give to MSI access to as much of the DC Sites as may be necessary to enable MSI to commence and proceed with the installation of the Works in accordance with the Program of Work or for performance of facilities management services. Any reasonable proposal of MSI for access to DC Site to proceed with the installation of any Works in accordance with the Program of Work shall be considered for approval and shall not be unreasonably withheld by the Authority. Such requests shall be made to the Authority's representative in writing at least 7 (seven) days prior to start of the Work.

19. Commencement of Installation

19.1 MSI shall co-ordinate with the Authority and stakeholders for the parallel setup of DC Site along with the installation of other areas as mentioned in Section 4 & 6: of the RFP Volume II document.

19.2 As per guidelines of Telecom Regulatory Authority of India (TRAI), resale of bandwidth connectivity is not allowed. In such a case tripartite agreement should be entered into between the Authority, MSI and internet service provider(s). Tri partite agreement to be provided later.

19.3 The plan and design documents thus developed shall be submitted by MSI for approval by the Authority.

19.4 After obtaining the approval from the Authority, MSI shall commence the installation of products.

20. Reporting Progress

20.1 MSI shall monitor progress of all the activities related to the execution of the Contract and shall submit to the Authority progress reports with reference to all related work, Milestones and their progress during the implementation phase.

20.2 Formats for all above mentioned reports and their dissemination mechanism shall be discussed and finalized along with Project Plan. The Authority on mutual agreement between both Parties may change the formats, periodicity and dissemination mechanism for such reports.

20.3 Periodic meetings shall be held between the representatives of the Authority and MSI once in every 15 days during the implementation phase to discuss the progress of implementation. After the implementation phase is over, the meeting shall be held as an ongoing basis, as desired by Authority, to discuss the performance of the Contract.

20.4 MSI shall ensure that the respective solution teams involved in the execution of Works are part of such meetings.

20.5 Several review committees involving representative of the Authority and senior officials of MSI shall be formed for the purpose of the Project. These committees shall meet at regular intervals, as decided by the Authority at a later stage, to oversee the progress of the implementation of the Project.

20.6 All the Goods, Services and manpower to be provided/deployed by MSI under the Contract and the manner and speed of execution and maintenance of the Work and Services are to be conducted in a manner to the satisfaction of Authority's representative in accordance with the Contract.

21. Inspection by the Authority:

21.1 The Authority reserves the right to inspect and monitor/assess the progress/performance of the Works/Services/Project at any time during the course of the Contract. The Authority may demand and upon such demand being made, MSI shall provide documents, data, material or any other information which the Authority may require, to enable it to assess the progress/performance of the Works/Services/Project.

22. Monitoring of MSI's performance:

22.1 At any time during the course of the Contract, the Authority shall have the right to conduct, either itself or through another agency as it may deem fit, an audit to monitor the performance by MSI of its obligations/functions in accordance with the standards committed to or required under the Contract and MSI undertakes to cooperate with and provide to the Authority or to the said agency any Document(s) and other details

as may be necessary/required by them for this purpose. Such audit shall not include 'MSI's books of accounts.

22.2 Should the rate of progress of the Works or any part of it, at any time falls behind the stipulated time for completion of any Milestone related to the Works or is found to be too slow to ensure completion of the Works by the stipulated time, or is in deviation to Tender requirements/standards, the Authority's representative shall so notify MSI in writing.

22.3 MSI shall send reply to the written notice giving details of the measures it proposes to take to expedite the progress so as to complete the Works by the prescribed time or to ensure compliance to RFP requirements/Contract. MSI shall not be entitled to any additional payment for taking such steps. If at any time it should appear to the Authority or Authority's representative that the actual progress of the Works does not conform to the Approved Plan, MSI shall produce at the request of the Authority's representative a revised Plan showing the modification to the Approved Plan necessary to ensure completion of the Works within the time for completion or steps initiated to ensure compliance to the stipulated requirements

22.4 The submission seeking approval by the Authority or its representative of such Plan shall not relieve MSI of any of its obligations or responsibilities under the Contract.

22.5 In case during execution of Works, the progress falls behind schedule or does not meet the Tender requirements, MSI shall deploy extra manpower/resources to make up the progress or to meet the RFP/Contract requirements. Plan for deployment of extra man power/resources shall be submitted to the Authority for its review and approval. All time and cost effect in this respect shall be borne, by MSI within the Contract value.

23. Knowledge of Data Center's Server Room and ICCC

23.1 The Authority shall grant MSI access to the Data Center's Server Room and ICCC for inspection of such facilities before commencement of installation. Upon such inspection a plan shall be drawn up mutually by the Parties.

23.2 MSI shall be deemed to have familiarized itself with the knowledge of the Data Center's Server Room, /ICCC and its surroundings and information available in connection therewith and to have satisfied itself the form and nature thereof including, the data contained in the Bidding Documents, the physical and climatic conditions, the quantities and nature of the Works and materials necessary for the completion of the Works, the means of access, etc. and in general to have obtained itself all necessary information of all risks, contingencies and circumstances affecting its obligations and responsibilities therewith under the Contract and its ability to perform it. However, if during pre-installation survey/during delivery or installation, MSI detects physical conditions and/or obstructions affecting the Work, MSI shall take all measures to overcome them.

24. Project Plan

24.1 Within 15 (fifteen) calendar days of Effective Date of the Contract/issuance of letter of intent/ Letter of Award, MSI shall submit to the Authority for its approval a detailed Project Plan with details of the Project showing the sequence, procedure and method

in which it proposes to carry out the Works. The Plan so submitted by MSI shall conform to the requirements and timelines specified in the Contract. The Authority and MSI shall discuss and agree upon the work procedures to be followed for effective execution of the Works, which MSI intends to deploy and shall be clearly specified. The Project Plan shall include but not be limited to Project organization, communication structure, proposed staffing, roles and responsibilities, processes and tool sets to be used for quality assurance, security and confidentiality practices in accordance with Good Industry Practices and delivery schedule in accordance with the Contract. Approval by the Authority's Representative of the Project Plan shall not relieve MSI of any of its duties or responsibilities under the Contract.

24.2 If MSI's Work Plans necessitate a disruption/shutdown in Authority's operation, the Plan shall be mutually discussed and developed so as to keep such disruption/shutdown to the barest unavoidable minimum. Any time and cost arising due to failure of MSI to develop/adhere such a Work Plan shall be to its account.

25. Adherence to safety procedures, rules regulations and restriction

25.1 MSI's Team shall comply with the provision of all Applicable Laws including labour laws, rules, regulations and notifications issued there under from time to time. All safety and labour laws enforced by statutory Government Agencies and by Authority shall be applicable in the performance of this Contract and MSI's Team shall abide by these Applicable Laws.

25.2 Access to the Data Center's Server Room, ICCC shall be strictly restricted. No access to any person except the essential members of MSI's Team who are duly authorized by the Authority and are genuinely required for execution of the Works or for carrying out management/maintenance shall be allowed entry. Even if access is required to be provided to such unauthorized personnel of MSI, the same shall be with prior approval of Authority's Representative and restricted to the pertaining equipment of the Authority on a need basis only. MSI shall maintain a log of all activities carried out by each of its team/ Key Personnel.

25.3 No staff of MSI, except the essential staff who have genuine work-related need, should be given access to the facilities. All such access should be logged in a loss free manner for permanent record with unique biometric identification of the staff to avoid misrepresentations or mistakes.

25.4 MSI shall take all measures necessary or proper to protect its Key Personnel, Work and facilities and shall observe all reasonable safety rules and instructions. MSI's Team shall adhere to all security requirement/regulations of the Authority during the execution of the Work. Authority's employees shall also be required to comply with safety procedures/policy.

25.5 MSI shall report as soon as possible any evidence, which may indicate or is likely to lead to an abnormal or dangerous situation related to the Works/Project and shall take all necessary emergency control steps to avoid such abnormal situations.

26. Statutory Requirements

26.1 During the tenure of the Contract nothing shall be done by MSI or its team including Consortium Members in contravention of Applicable Laws or any amendment thereof governing inter-alia customs, stowaways, foreign exchange etc. and shall keep Authority indemnified in this regard.

27. Authority's Obligations

27.1 Authority or its nominated representative shall act as the nodal point for implementation of the Contract and for issuing necessary instructions, approvals, commissioning, acceptance certificates, payments etc. to MSI.

27.2 Authority shall ensure that timely approvals are provided to MSI as and when required, which may include approval of Project Plans, implementation methodology, design documents, specifications, or any other document necessary in fulfillment of the Contract.

27.3 The Authority's representative shall interface with MSI, to provide the required information, clarifications, and to resolve any issues as may arise during the execution of the Contract. Authority shall provide adequate cooperation in providing details, coordinating and obtaining of approvals from various governmental agencies, in cases, where the intervention of the Authority is proper and necessary.

27.4 Authority may provide on MSI's request, particulars/information/or documentation that may be required by MSI for proper planning and execution of the Works and for providing Services covered under the Contract and for which MSI may have to coordinate with respective vendors.

27.5 Authority shall provide to MSI only sitting space and basic infrastructure not including, stationery and other consumables at the Authority's office locations.

27.6 Authority reserves the right to procure the hardware, including devices on quarterly basis in first year, based on actual deployment and O&M shall be applicable whenever the devices are procured and deployed till end of the Contract.

27.7 Readiness of the Project site: Authority hereby agrees to make the Project sites ready as per the agreed specifications, within the agreed timelines. Authority agrees that MSI shall not be in any manner liable for any delay arising out of Authority's failure to make the site ready within the stipulated period.

28. Payments

28.1 Authority shall make payments to MSI at the times and in the manner set out in the Payment schedule as specified under Payment Milestones in RFP Volume II subject to the penalties as mentioned under Clause 42 of Section C- Service Levels of Volume 3. Authority shall make all efforts to make payments to MSI within 45 (forty-five) days of receipt of invoice(s) and all necessary supporting documents.

28.2 All payments agreed to be made by Authority to MSI in accordance with the Bid shall be inclusive of all statutory levies, duties, taxes and other charges whenever

levied/applicable, if any, and Authority shall not be liable to pay any such levies/other charges under or in relation to the Contract and/or the Services.

28.3 No invoice for extra work/change order on account of change order shall be submitted by MSI unless the said extra work/change order has been authorized/approved by the Authority in writing in accordance with Change Control Note (as mentioned under Annexure I of this section of the RFP)

28.4 In the event of Authority noticing at any time that any amount has been disbursed wrongly to MSI or any other amount is due from MSI to the Authority, the Authority may without prejudice to its rights recover such amounts by other means after notifying MSI or deduct/adjust such amount from any payment falling due to MSI. The details of such recovery, if any, shall be intimated to MSI. Similarly, MSI shall also be entitled to receive the payment of any undisputed amount under subsequent invoice for any amount that has been inadvertently omitted in previous invoice on the part of the Authority or MSI.

28.5 All payments to MSI shall be subject to the deductions of tax at source under Income Tax Act, and other taxes and deductions as provided for under Applicable Laws. All costs, damages or expenses which Authority may have paid or incurred, for which under the provisions of the Contract, MSI is liable, the same shall be deducted/set off by Authority from any payments/dues payable to MSI. All payments to MSI shall be made after making necessary deductions as per terms of the Contract and recoveries towards facilities, if any, provided by the Authority to MSI on chargeable basis.

29. Intellectual Property Rights

29.1 Except for any ownership rights in any intellectual property that have been expressly granted to the MSI under the Framework Agreement, the Authority shall exclusively retain all rights, title and interest in and to any third party licensed technology, including all worldwide technology and Intellectual Property Rights which has been used for the Project.

29.2 Preservation of notice: MSI shall not remove, efface or obscure any copyright notices or other proprietary notices or legends from any licensed technology or materials provided under the Contract, and shall reproduce all such notices and legends when incorporating licensed technology or materials into any integrated products.

29.3 Authority shall exclusively own and have a right in perpetuity to use all newly created Intellectual Property Rights which have been developed solely during execution of the Contract, including but not limited to all processes, software, technology, processes, methodologies, process improvements, ideas, concepts, products, specifications, reports and other documents which have been newly created and developed by MSI or its Subcontractor solely during the performance of Services/execution of the Contract (hereinafter “Developed Materials”) and for the purposes of inter-alia use during the Project. MSI shall have no rights in such Developed Materials and undertakes to promptly disclose to the Authority all such Intellectual Property Rights/Developed Materials created during the performance of the Services/Works. MSI shall promptly assign, completely and in writing to Authority any such Developed Materials and shall execute all such agreements/documents and obtain all permits and

approvals that may be necessary to perfect Authority's rights in the Developed Materials. It is a fundamental provision of the Contract that MSI will not violate or breach any Intellectual Property Rights of the Authority. Should MSI use or provide unauthorised access to the Developed Materials or breach any of the confidentiality of these Developed Materials, the Authority shall have the right to terminate the Contract forthwith and seek injunctive and other equitable reliefs.

29.4 Pre-existing work: All Intellectual Property Rights existing prior to the Effective Date of the Contract shall belong to the Party that owned such rights immediately prior to the Effective Date. Subject to the foregoing, the Authority will also have rights to use and copy all Intellectual Property Rights, process, specifications, reports and other document, drawings, manuals etc. provided or used by the MSI / Consortium / Sub-Contractors as part of the Scope of Works under the Contract for the purpose of the Contract on non-exclusive, non-transferable, perpetual, royalty-free license to use basis.

29.5 Commercially off the Shelf (COTS): / third party products: All COTS products and related solutions and fixes provided pursuant to the Contract shall be licensed according to the terms of the license agreement packaged with or otherwise applicable to such products. Such licenses shall be brought on behalf of and in the name of the Authority or mentioning the Authority as the end user of such licenses. MSI shall be responsible for arranging any licenses associated with products. Unless otherwise specifically restricted by the licensing terms of the COTS products, all Intellectual Property Rights in any development/enhancement/customization etc. done on the COTS products pursuant to the Contract shall be owned by the Authority.

29.6 Further, the MSI shall be obliged to ensure that all Applicable Permits which are, inter-alia, necessary for use of the Deliverables, Goods, Services, applications works etc. provided/undertaken by the MSI / Consortium / Sub-Contractors under the Contract shall be acquired in the name of the Authority and to use such permits till the term of such permits on behalf of the Authority solely for the purpose of execution of any of its obligations under the terms of the Contract. However, even subsequent to the Term/expiry of the Contract, such Approvals/Applicable Permits shall endure to the exclusive benefit of the Authority.

29.7 MSI shall not copy, reproduce, translate, adapt, vary, modify, disassemble, decompile or reverse engineer or otherwise deal with or cause to reduce the value of the Products except as expressly authorized by Authority in writing.

30. Taxes

30.1 MSI shall bear all personal taxes levied or imposed on its Personnel, or any other member of MSI's Team, etc. on account of payment received under the Contract. MSI shall bear all corporate taxes, levied or imposed on MSI on account of payments received by it from the Authority for the Work done/Services provided under the Contract.

30.2 MSI shall bear all taxes and duties as may be levied or imposed on MSI under or in relation to the Contract and under the Applicable Laws including but not limited to Goods & Services Tax (GST) (including any IGST,CGST & SGST) and all Income Tax

levied under Indian Income Tax Act – 1961 or any amendment thereof during the entire Contract period and thereafter till such time the liability relates to MSI's obligation under the Contract, i.e., on account of Goods supplied and Services rendered and payments received by it from the Authority under the Contract. It shall be the responsibility of MSI to submit to the concerned Indian authorities the returns and all other connected documents required for this purpose. MSI shall also provide the Authority such information, as it may be required in regard to MSI's details of payment made by the Authority under the Contract for proper assessment of taxes and duties as may be imposed under Applicable Laws. The amount of tax withheld by the Authority shall at all times be in accordance with Indian Tax Law or any other Government Agency and the Authority shall promptly furnish to MSI original certificates for tax deduction at source and paid to the Tax authorities.

30.3 MSI agrees that it shall comply with the Indian Income Tax Act or any other Applicable Laws in force from time to time and pay Indian Income Tax or other applicable taxes and duties, as may be imposed/levied on them by the Indian Income Tax Authorities/Government Authorities, for the payments received by them for the Works performed under the Contract.

30.4 Bidders shall fully familiarize themselves about the taxes applicable to the Bidders under Applicable Laws on the amounts payable by the Authority to them under the Contract. All such taxes must be included by Bidders in their financial proposal. (Bidder to find out applicable taxes for the components being proposed.)

30.5 Should MSI fail to submit returns/pay taxes in times as stipulated under applicable Indian/State Tax Laws, and consequently, any interest or penalty is imposed by the concerned authority on Authority/MSI, MSI shall bear the same. MSI shall indemnify Authority from and against any and all claims, liabilities, losses or damages arising out of the Contract or in connection with such taxes, including interest and penalty levied/assessed by any such tax authority against the Authority/MSI.

30.6 The goods and services tax (GST) on Works (central or state) if levied on supplies made from indigenous vendors for the Works shall be borne by MSI within the Contract price. Any other tax/duty, if applicable, shall be payable extra, at actuals by the Authority in accordance with the conditions of the Contract and upon submission of proof of payment of such taxes.

30.7 The Authority shall if so required by Applicable Laws in force, at the time of payment, deduct income tax payable by MSI at the rates in force, from the amount due to MSI and pay to the concerned tax authority directly.

31. Indemnity

31.1 MSI hereby agrees to indemnify defend and hold harmless the Authority and its Affiliates, respective officers, directors and agents and their respective successors and assigns from and against any and all claims (including from third parties), losses, liabilities of any kind howsoever suffered, fees (including reasonable attorneys' fees, disbursements and costs of investigation), damages, cost and expenses (collectively "Losses"), arising or incurred inter alia during and after

Contract period in connection with:

a) any negligence or wrongful act or omission by MSI or any third party associated with MSI in connection with or incidental to the Contract;

b) MSI or its Sub Contractor's actual or alleged failure occurring after the Effective Date to observe or perform any duties or obligations required to be observed or performed by MSI or its Subcontractor under or with respect to any obligations under the Contract;

c) the damage to or loss or destruction occurring after the Effective Date of any real or tangible personal property in the possession or under the control of MSI, or any Affiliate thereof;

d) the death or bodily injury occurring after the Effective Date of any agent, employee, Subcontractor's employee, visitor of MSI or its Subcontractor;

e) any breach of MSI's representations and warranties set forth in the Contract occurring after the Effective Date to the extent caused by MSI or its Affiliates, or its or their agents, employees or Subcontractors;

31.2 MSI agrees to indemnify, defend and hold harmless the Authority and/or its Affiliates from and against all losses incurred by the Authority and/or its Affiliates as a result of any allegations that the software, data, intellectual property or other materials supplied by the MSI or used by MSI infringes, misappropriates, or violates any patent, copyright, trademark or trade secret or other intellectual property of any third party. In the event of any third party claim against the Authority and/or its Affiliates in respect of the use of such software data, intellectual property or other materials, in addition to the indemnification obligations set forth herein, the Authority, at its option, may: (a) obtain a right to use such software or materials without obligation on the part of the Authority to the owner of the allegedly infringed Intellectual Property; (b) modify the software or materials, without materially diminishing the functionality or performance thereof, to become non-infringing at MSI's sole expense; or (c) require that the MSI discontinue the use of the infringing software or materials. Notwithstanding the foregoing, the Authority will have no liability for any third party claim of infringement based upon: (i) modifications of the software or materials that are not made by the Authority; (ii) the use of software or materials in connection with another product or service (the combination of which causes the infringement) if the Authority did not approve of such use; or (iii) MSI's non-compliance with the Authority's specific instructions. MSI shall take commercially reasonable steps to mitigate damages arising from the liability arising under this clause.

31.3 Regardless of anything contained (except for MSI's liability for bodily injury arising out of gross negligence or willful misconduct for which it is legally liable and it's liability for infringement of any Intellectual Property Rights including of any third party in accordance with the terms of the Contract), the total liability of MSI, is restricted to the total value of the Contract.

32. Representations and Warranties:

32.1 MSI represents that it is a company duly organized, validly existing and in good standing under the Applicable Laws and has full corporate power and authority to implement the terms hereof. It is specifically agreed between the Parties that MSI has all the Approvals and Permits required to execute the Works/provide the Services under the Contract.

32.2 MSI warrants that it is not currently in breach of, in default under, or in violation of, and the execution and delivery of the Contract and the performance of its obligations thereunder will not constitute or result in any breach of, default under or violation of, any Applicable Laws, rule or regulation of any governmental unit, or the provisions of the MSI's articles of association or bye-laws, or any franchise or license, or other agreement by which it is bound to abide with.

32.3 It is fundamental term of the Contract that MSI has been and shall continue to comply with all the Applicable Laws, including all the applicable labour laws and regulations, and shall keep the Authority indemnified from all acts of commission, breaches and/or any claims and expenses to which the Authority may be put or involved due to MSI's non-compliance of the such laws and regulations.

32.4 A comprehensive warranty applicable on Goods supplied under the Contract shall be provided by the MSI for the remaining period of Contract from the date of acceptance of respective system by the Authority.

32.5 Technical support for software applications shall be provided by MSI/ the respective OEMs for the period of Contract. The technical support should include all upgrades, updates and patches to the respective software applications.

32.6 The MSI warrants that the Goods supplied under the Contract are new, non-refurbished, unused and recently manufactured; shall not be nearing end of sale/End of support; and shall be supported by the MSI and respective OEM along with Service and spares support to ensure its efficient and effective operation for the entire duration of the Contract.

32.7 The MSI warrants that the Goods supplied under the Contract shall be of the highest grade and quality and consisted with the established and generally accepted standards for materials of this type. The Goods shall be in full conformity with the specifications and shall operate properly and safely. All recent design improvements in Goods, unless provided otherwise in the Contract, shall also be made available.

32.8 The MSI further warrants that the Goods supplied under the Contract shall be free from all encumbrances and defects/faults arising from design, material, manufacture or workmanship (except insofar as the design or material is required by the Authority's specifications) or from any act or omission of the MSI, that may develop under normal use of the supplied Goods in the conditions prevailing at the respective Data Center Sites.

32.9 The Authority shall promptly notify the MSI in writing of any claims arising under this warranty.

32.10 Upon receipt of such notice, the MSI shall, with all reasonable speed, repair or replace the defective Goods or parts thereof, without prejudice to any other rights which the Authority may have against the MSI under the Contract.

32.11 If the MSI, having been notified, fails to remedy the defect(s) within a reasonable period, the Authority may proceed to take such remedial action as may be necessary, at the MSI's risk and expense and without prejudice to any other rights which the Authority may have against the MSI under the Contract.

32.12 Any (OEM) specific warranty terms that do not conform to conditions under the Contract shall not be acceptable.

32.13 MSI shall provide adequate supervision to ensure correct execution of the Works/performance of the Services in accordance with the prevailing instructions agreed upon between the Authority and the MSI. Further, MSI and its Key Personnel shall take utmost care in the performance of the Works/Services and ensure that none of the properties of the Authority gets damaged due to any action taken or any failure to act on its part.

33. Term and Extension of the Contract

33.1 The Contract Term/period shall commence from the date of signing of contract or issuance of letter of intent/letter of award , whichever is earlier, and shall remain valid for 72 (Seventy Two) months from the date of signing of the Contract (hereinafter "Term"). MSI shall complete all Works stipulated under the Contract within the time period specified under this clause.

33.2 If any delay occurs due to circumstances beyond control of MSI such as strikes, lockouts, fire, accident, defective materials, delay in obtaining Applicable Permits/Approvals or any cause whatsoever beyond the reasonable control of MSI, a reasonable extension of time/ Term, upon a request being made by MSI in writing at least three months in advance shall be granted by the Authority in writing.

33.3 Notwithstanding what has been stated under Clause 31.2, the Authority shall reserve the sole right to grant any such extension to the Term abovementioned and shall notify in writing to MSI, at least 3 (three) months before the expiration of the Term hereof, whether it shall grant MSI an extension of the Term or not. The decision to grant or refuse the extension of the Term shall be at the Authority's sole discretion and such extension of the Contract, if any, shall be as per terms agreed mutually between the Parties.

33.4 Where the Authority is of the view that no further extension of the Term should be granted to MSI, the Authority shall notify MSI of its decision at least 3 (three) months prior to the expiry of the Term. Upon receipt of such notice, MSI shall continue to perform all its obligations hereunder till the duration of the Term. During the notice period, the Authority shall either appoint an alternative agency/Replacement Service Provider/reappoint MSI for a short extension or create its own infrastructure to operate such Services as are provided under the Contract.

34. Dispute Resolution

34.1 In case, a dispute is referred to arbitration, the arbitration shall be under the Indian Arbitration and Conciliation Act, 1996 and any statutory modification or re-enactment thereof.

34.2 If during the subsistence of the Contract or thereafter, any dispute between the Parties hereto arising out of or in connection with the validity, interpretation, implementation, breach or any alleged breach of any provision of the Contract or regarding any question, including as to whether the termination of the Contract by one Party hereto has been legitimate/valid, the Parties hereto shall endeavor to settle such

dispute amicably through joint discussion and/or by Conciliation to be governed by the Arbitration and Conciliation Act, 1996. However, despite such efforts, if the dispute, differences or controversy still remains unresolved for a period of 30 days of its having been raised, then the same shall be referred to Arbitration.

34.3 The Arbitration proceedings shall be held in the following manner:

i. The Arbitration proceedings shall be held in Agartala, Uttar Pradesh, India.

ii. The Arbitration proceeding shall be governed by the Arbitration and Conciliation Act, 1996 and any re-enactment(s) and/or modification(s) thereof and of the Rules framed thereunder shall apply to arbitration proceedings.

iii. The proceedings of Arbitration shall be in English language.

iv. Any dispute, difference or question to be referred to arbitration shall be initially referred to a mutually acceptable sole arbitrator. In case the Parties are unable to agree upon the sole arbitrator, then each Party shall appoint one arbitrator each and the two arbitrators so appointed shall appoint the third arbitrator, who shall be the Presiding Arbitrator. The consortium of the three Arbitrators shall form the Arbitral Tribunal.

v. In case, a Party fails to appoint an arbitrator within 30 days from the receipt of the request to do so by the other Party or if the two Arbitrators so appointed fail to agree on the appointment of third Arbitrator within 30 days from the date of their appointment upon request of a party, the Chief Justice of the Tripura High Court or any person or institution designated by him shall appoint the Arbitrator/Presiding Arbitrator upon request of one of the Parties.

vi. Any letter, notice or other communications dispatched to MSI relating to either arbitration proceeding or otherwise whether through the post or through a representative on the address last notified to the Authority by MSI shall be deemed to have been received by MSI although returned with the remarks, refused 'undelivered' where about not known or words to that effect or for any other reasons whatsoever

vii. If the Arbitrator so appointed dies, resigns, incapacitated or withdraws for any reason from the proceedings, it shall be lawful for the Authority to appoint another person in his place in the same manner as aforesaid. Such person shall proceed with the reference from the stage where his predecessor had left if both Parties consent for the same; otherwise, he shall proceed de novo.

viii. It is a term of the Contract that the Party invoking arbitration shall specify all disputes to be referred to arbitration at the time of invocation of arbitration and not thereafter.

ix. It is also a term of the Contract that neither Party to the Contract shall be entitled for any interest on the amount of the award.

x. The Arbitrator shall give reasoned award and the same shall be final, conclusive and binding on the Parties.

xi. The fees of the arbitrator, costs and other expenses incidental to the arbitration proceedings shall be borne equally by the Parties.

35. Conflict of interest

35.1 MSI shall disclose to the Authority in writing, all actual and potential conflicts of interest that exist, arise or may arise (either for MSI or MSI's Team) in the course of providing Goods and performing the Works/Services as soon as practical after it becomes aware of that conflict.

36. Publicity

36.1 MSI shall not make or permit to be made a public announcement or media release about any aspect of this Contract unless the Authority first gives MSI its written consent.

37. Force Majeure

37.1 Force Majeure shall not include any events caused due to acts/omissions of MSI resulting in a breach/contravention of any of the terms of the Contract and/or MSI's Bid. It shall also not include any default on the part of MSI due to its negligence or failure to implement the stipulated/proposed precautions, as were required to be taken under the Contract.

37.2 The failure or occurrence of a delay in performance of any of the obligations of either Party shall constitute a Force Majeure event only where such failure or delay could not have reasonably been foreseen and shall mean an occurrence beyond the reasonable control and without the fault or negligence of either Parties affected and which the other Party is unable to prevent or provide against by the exercise of reasonable diligence including, but not limited to: war, or hostility, acts of the public enemy, civil commotion, sabotage, fires, floods, vandalism(due to law & order situation) , terrorism, explosions, epidemics, quarantine restriction, strikes, lockouts or act of God, or where despite the presence of adequate and stipulated safeguards the failure to perform obligations has occurred at any location in scope (hereinafter referred to as "Force Majeure Event(s)"). In such an event, the affected Party shall inform the other Party in writing within 5(five) days of the occurrence of such event. Any failure or lapse on the part of MSI in performing any obligation as is necessary and proper, to negate the damage due to projected Force Majeure Events or to mitigate the damage that may be caused due to the above mentioned events or the failure to provide adequate disaster management/recovery or any failure in setting up a contingency mechanism would not constitute Force Majeure, as set out above.

37.3 In case of a Force Majeure Event, all Parties shall endeavor to agree on an alternate mode of performance in order to ensure the continuity of the Service/ Works and implementation of the obligations of a Party under the Contract and to minimize any adverse consequences of Force Majeure.

38. Delivery

38.1 MSI shall bear the cost for packing, transport, insurance, storage and delivery of all the Goods for "RFP" for Implementation of the Project in Agartala City" at all locations identified by the Authority in Agartala City.

38.2 The Goods under the Contract shall conform to the standards mentioned in the RFP, and when no applicable standard is mentioned, to the authoritative standards, such standard shall be approved by Authority.

38.3 MSI shall only procure the hardware and software after approvals from a designated committee/Authority.

38.4 MSI's Key Personnel shall have the required experience and proper qualifications to perform the Services, and the Authority shall have the right to reject any such Personnel if found unfit by Authority to provide the Services. MSI shall also impart the appropriate training to its engineers and Personnel on the current and emerging technologies, concepts and configurations in order to provide the Services in a more efficient manner.

39. Insurance

39.1 The Goods supplied under the Contract shall be comprehensively insured by MSI at its own cost, against any loss or damage, for the entire period of the Contract. MSI shall submit to the Authority, documentary evidence issued by the insurance company, indicating that such insurance has been taken.

39.2 MSI shall bear all the statutory levies like customs, insurance, freight, etc. applicable on the Goods and also the charges like transportation charges, GST etc. that may be applicable till the Goods are delivered at the respective sites of installation shall also be solely borne by MSI.

39.3 MSI shall take out and maintain at its own cost, on terms and conditions approved by the Authority, all necessary insurance against the risks, and for the coverage's, as specified below:

a. at the Authority's request, shall provide evidence to the Authority showing that such insurance has been taken out and maintained and that the current premiums therefore have been paid; and

b. Employer's liability and workers' compensation insurance in respect of the Personnel of the MSI, in accordance with the relevant provisions of the Applicable Laws including personal accident and death in respect of its Personnel or any other insurance as may be appropriate and the proof of such insurances shall be provided to Authority, when so requested. Notwithstanding the above, the Key Personnel of MSI shall be and shall remain the employees of MSI and MSI alone shall be responsible for the payment of all dues with respect to them or meeting any statutory obligations under the Applicable Laws with respect to such Personnel.

40. Transfer of Ownership

40.1 MSI must transfer all titles to the assets and Goods procured for the purpose of the Project to the Authority at the time of Acceptance of System. This includes all licenses, titles, source code, certificates, hardware, devices, equipment's etc. related to the System designed, developed, installed and maintained by MSI. MSI is expected to provide source code, transfer Intellectual Property Rights and ownership rights of only those solutions which would be customized by MSI for the use of the Authority. In case the Parties decide to use any pre-existing work not related to the Project for

any Project use and which is not owned by either Party, MSI and the Authority shall mutually decide on use of such work on terms to be decided on mutual consent. Notwithstanding the foregoing, any Intellectual Property or Intellectual Property Rights that were developed, owned or licensed by a Party prior to execution of the Contract shall remain with such Party unless the Parties agree otherwise by express written consent.

40.2 Forthwith upon expiry or earlier termination of the Contract and at any other time on demand by the Authority, MSI shall deliver to the Authority all Documents provided by or originating from the Authority and all Documents produced by or from or for MSI in the course of performing the Services, unless otherwise directed in writing by the Authority at no additional cost. MSI shall not, without the prior written consent of the Authority store, copy, distribute or retain any such Documents.

41. Exit Management Plan

41.1 An Exit Management plan shall be furnished by MSI in writing to the Authority within 90 (ninety) days from the date of signing of the Contract, which shall deal with at least the following aspects of exit management in relation to the Contract as a whole and in relation to the Project implementation, and Service Level monitoring:

a. a detailed program of the transfer process that could be used in conjunction with a Replacement Service Provider including details of the means to be used to ensure continuing provision of the Services throughout the transfer process or until the cessation of the Services and of the management structure to be used during the transfer;

b. plans for provision of contingent support to Project and Replacement Service Provider for a reasonable period after transfer;

c. Exit Management Plan in case of normal termination of Contract period;

d. Exit Management Plan in case of any eventuality due to which Project is terminated before the Contract period; and

e. Exit Management Plan in case of termination of MSI.

41.2 Exit Management Plan at the minimum shall adhere to the following:

a. 3 (Three) months of the support to Replacement Service Provider post termination of the Contract;

b. all reasonable assistance necessary to ensure that an orderly transfer is achieved with minimal disruption, to Replacement Service Provider, of the Services, functions and operations that were provided prior to termination of Contract/exit of MSI from Project, complete handover of the planning documents, bill of materials, functional requirements specification, technical specifications of all equipment, change requests if any, sources codes, wherever applicable, reports, documents and other relevant items to the Replacement Service Provider/Authority; and

c. Certificate of acceptance from authorized representative of Replacement Service Provider issued to MSI on successful completion of handover and knowledge transfer.

41.3 In the event of termination or expiry of the Contract, Project implementation, or Service Level monitoring, both MSI and Authority shall comply with the exit management plan.

41.4 During the exit management period, MSI shall use its best efforts to deliver the Works/Services.

B. PART B – SPECIAL CONDITIONS OF CONTRACT

42. Performance Security

42.1 To guarantee its performance under the Contract, the MSI shall provide to Authority in its favour a Performance Bank Guarantee (PBG) which is unconditional, unequivocal and irrevocable for an amount equivalent to 10% of the order value of the Contract in the format prescribed in RFP issued by any of the nationalized banks only. The Performance Bank Guarantee shall be kept valid for the Term of the Contract and any extension of the Term and upto a period of 6 (six) months after the termination or expiry of the Contract. The Performance Bank Guarantee shall be encashed by the ASCL in the event of MSI's failure to complete obligations or breach by MSI of any of the terms and conditions of the Contract.

43. Liquidated Damages

43.1 If MSI fails to supply, install or maintain any or all of the Goods or fails to complete the Works or fails to provide the Services as per the Contract, within the time period(s) specified in the RFP Vol II, the Authority without prejudice to its other rights and remedies under the Contract, deduct from the Contract price, as liquidated damage per week of 0.2% of the CAPEX of Contract / request order value per week for first 8 (eight) weeks and 0.3% per week for every subsequent week till such time the default continues.

43.2 The deduction shall not in any case exceed 10 % of the Contract value.

43.3 The Authority may without prejudice to its right to effect recovery by any other method, deduct the amount of liquidated damages from any payments due to MSI in its hands (which includes the Authority's right to claim such amount against MSI's Bank Guarantee) or which may become due to MSI at a prospective date. Any such recovery or liquidated damages shall not in any way relieve MSI from any of its obligations to complete the Work or from any other obligations and liabilities under the Contract.

43.4 Delay not attributable to MSI shall be considered for exclusion for the purpose of computing liquidated damages.

44. Limitation of Liability:

44.1 Limitation of MSI's Liability towards the Authority:

a. Except as otherwise provided in the Contract and which includes indemnification obligations under the Contract or in cases of gross negligence or willful misconduct on the part of MSI or on the part of any person or company acting on behalf of MSI in carrying out the Services, in no event either Party shall be liable to the other Party for any special, exemplary, punitive or similar damages, indirect or consequential loss or damage (including loss of revenue and profits) arising out of or relating to the Contract;

44.2 MSI, with respect to damage caused by MSI to Authority's property, shall not be liable to Authority:

a. for any indirect or consequential loss or damage; and

b. For any direct loss or damage that exceeds the total payments payable under the Contract to MSI hereunder.

44.3 This limitation of liability shall not be applicable or restrict MSI's liability in any manner for injury, loss of life caused to any person or damage to third party's property or infringement of any Intellectual Property Rights caused by MSI or any Person (including MSI's Subcontractor)acting on behalf of MSI in carrying out the Services.

45. Ownership and Retention of Documents

45.1 The Authority shall own the Document(s), prepared by or for MSI arising out of or in connection with the Contract.

45.2 Forthwith upon expiry or earlier termination of this Contract and at any other time on demand by the Authority, MSI shall deliver to the Authority all Documents provided by or originating from the Authority and all Documents produced by or for MSI in the course of performing the Services, unless otherwise directed in writing by the Authority at no additional cost. MSI shall not, without the prior written consent of the Authority store, copy, distribute or retain any such Documents.

46. Information Security

46.1 MSI shall not carry any written/printed document, layout diagrams, compact disk, hard disk, storage tapes, other storage devices or any other goods/material proprietary to Authority into/out of any Project Location without written permission from the Authority.

46.2 MSI shall not destroy any unwanted documents, defective tapes/media present at any location on their own. All such documents, tapes/media shall be handed over to the Authority.

46.3 All documentation and media at any location whether at the Project Location or otherwise, shall be properly identified, labeled and numbered by MSI. MSI shall keep track of all such items and provide a summary report of these items to the Authority whenever asked for.

46.4 Access to Authority's data and systems, internet facility by MSI at any location shall be in accordance with the written permission by the Authority. The Authority shall allow MSI to use its facilities in a limited manner subject to availability. It is the responsibility of MSI to prepare and equip itself in order to meet the requirements of providing the Services.

46.5 MSI must acknowledge that Authority's business data and other Authority proprietary information or materials, whether developed by Authority or being used by Authority pursuant to a license agreement with a third party (the foregoing collectively referred to herein as "proprietary information") are confidential and proprietary to Authority; and MSI along with its team agrees to use reasonable care to safeguard the proprietary

information and to prevent the unauthorized use or disclosure thereof, which care shall not be less than reasonable care used by MSI to protect its own proprietary information. MSI recognizes that the goodwill of Authority depends, among other things, upon MSI keeping such proprietary information confidential and that unauthorized disclosure of the same by MSI or its team could damage the goodwill of Authority, and shall be considered as a material breach of the Contract terms and conditions by MSI. MSI may come into possession of such proprietary information, even though MSI does not take any direct part in or furnish the Services performed for the creation of said proprietary information and it shall limit access of such proprietary information thereto only such employees with a need to such access to perform the Services . MSI and or its Key Personnel shall use such information only for the purpose of performing the said Services.

46.6 MSI shall, upon termination of the Contract for any reason, or upon demand by Authority, whichever is earlier, return any and all information provided to MSI by Authority, which would include any Confidential information or any proprietary information including any copies or reproductions, both hardcopy and electronic of such information.

46.7 By virtue of the Contract, MSI team may have access to information of the Authority and/or a third party which would include any Confidential Information or any proprietary information of such parties and will use such information only with prior approval of the Authority on a need only basis and to the extent required for performing the Services.

47. Records of contract documents

47.1 MSI shall at all-time make and keep sufficient copies of the process manuals, operating procedures, specifications, Contract documents and any other documentation as may be required to fulfil the obligations under the Contract.

47.2 MSI shall keep on the DC Site at least 3 (three) copies of each and every specification and copy of the Contract, in excess of it's own requirement and those copies shall be available at all times for use by the Authority's representative and by any other person authorized by the Authority's representative.

48. Security and Safety

48.1 MSI shall comply with the directions issued from time to time by the Authority and the standards related to the security and safety, in so far as it applies to the provision of the Services.

48.2 MSI shall upon reasonable request by the Authority, or its nominee(s) participate in regular meetings when safety and information technology security matters are reviewed.

49. Confidentiality

49.1 MSI shall not, either during the Term or after expiration of the Contract, disclose any proprietary or Confidential Information relating to the Services/Contract and/or

Authority's business/operations, information, application/software, hardware, business data, architecture schematics, designs, storage media and other information/documents without the prior written consent of the Authority.

49.2 The Authority reserves the right to adopt legal proceedings, civil or criminal, against MSI in relation to a breach of obligation by MSI under this clause

49.3 MSI shall do everything reasonably possible to preserve the confidentiality of the Confidential Information including execution of a confidentiality agreement with the Authority to the satisfaction of the Authority.

49.4 MSI shall notify the Authority promptly if it is aware of any unauthorized disclosure of the Confidential Information otherwise than as permitted by the Contract or with the authority of the Authority.

49.5 MSI shall be liable to fully recompense the Authority for any loss of revenue arising from breach of confidentiality.

50. Events of Default by MSI

50.1 The failure on the part of MSI to perform any of its obligations or comply with any of the terms of the Contract shall constitute an Event of Default on the part of MSI. The events of default are but not limited to the following:

a. MSI/MSI's Teams failure to perform/ adhere to any instructions or directives issued by the Authority which it deems proper and necessary to execute the Scope of Work or provide Services under the Contract, or

b. MSI/MSI's Teams failure to confirm/adhere to any of the key performance indicators as laid down in the Key Performance Measures/Service Levels, or if MSI has fallen short of matching such standards/benchmarks/targets as the Authority may have designated with respect to the System or any Goods, task or service, necessary for the execution of the Scope of Work and performance of Services under this Contract. The above mentioned failure on the part of MSI may be in terms of failure to adhere to performance, quality, timelines, specifications, requirements or any other criteria as defined by the Authority; or

c. MSI's failure to remedy a defect or failure to perform its obligations in accordance with the Service Specifications as per this RFP or any other specifications issued by the Authority, despite being served with a default notice which laid down the specific deviance on the part of MSI/MSI's Team to comply with any stipulations or standards as laid down by the Authority; or

d. MSI/MSI's Teams failure to adhere to any amended direction, instruction, modification or clarification as issued by the Authority during the term of the Contract and which the Authority deems proper and necessary for the execution of the Scope of Work under the Contract; or

e. MSI/MSI's Teams failure to demonstrate or sustain any representation or warranty made by it in the Contract, with respect to any of the terms of the Bid, the RFP and the Contract.

f. There is a proceeding for bankruptcy, insolvency, winding up or there is an appointment of receiver, liquidator, assignee, or similar official against or in relation to MSI; or

g. MSI/MSI's Team's failure to comply with or is in breach or contravention of any Applicable Laws.

50.2 Where there has been an occurrence of such defaults inter alia as stated above, the Authority shall issue a notice of default to MSI, setting out specific defaults/deviances/omissions/non-compliances/non-performances and providing a notice of 30 (thirty) days cure period to enable MSI to rectify such default committed.

50.3 Where despite the issuance of a default notice to MSI by the Authority, MSI fails to remedy the default within the cure period provided to the satisfaction of the Authority, the Authority may, where it deems fit, issue to MSI either another default notice or proceed to terminate the Contract forthwith.

51. Termination

51.1 The Authority may, terminate the Contract in whole or in part by giving MSI a prior written notice indicating its intention to terminate the Contract under the following circumstances:

a. Where the Authority is of the opinion that there has been such Event of Default on the part of MSI/MSI's Team which would make it proper and necessary to terminate the Contract and may include failure on the part of MSI to adhere to any part of its obligations under its Bid, the RFP or under the Contract.

b. Where it comes to the Authority's attention that MSI (or MSI's Team) is in a position of actual conflict of interest with the interests of the Authority, in relation to any of terms of MSI's Bid, the RFP or the Contract.

c. Where MSI's ability to survive as an independent corporate entity is threatened or is lost owing to any reason whatsoever, including *inter-alia* the filing of any bankruptcy proceedings against MSI, any failure by MSI to pay any of its dues to its creditors, the institution of any winding up proceedings against MSI or the happening of any such events that are adverse to the commercial viability of MSI. In the event of the happening of any events of the above nature, the Authority shall reserve the right to take any steps as are necessary, to ensure the effective transition of the sites, pilot site to a successor agency, and to ensure business continuity.

d. Termination for Insolvency: The Authority may at any time terminate the Contract by giving written notice to MSI, without compensation to MSI, if MSI becomes bankrupt or otherwise insolvent, provided that such termination shall not prejudice or affect any right of action or remedy which has accrued or shall accrue thereafter to the Authority.

e. MSI may, subject to written approval by the Authority, terminate the Contract before the expiry of the Term by giving the Authority a prior and written notice at least 3 (three) months in advance indicating its intention to terminate the Contract.

f. In case of Deliverables/ milestone which is approved by the Authority and payment is undisputed, the MSI may terminate the Contract in case of non-payment after 90 (ninety) days of serving the notice to ASCL.

52. Consequence of Termination

52.1 In the event of termination of the Contract due to any cause whatsoever, whether consequent to the stipulated term of the Contract or otherwise the Authority shall be entitled to impose any such obligations and conditions and issue any clarifications as may be necessary to ensure an efficient transition and effective business continuity of the Project which MSI shall be obliged to comply with and take all available steps to minimize loss resulting from that termination/breach, and further allow and provide all such assistance to the Authority and/or the successor agency/service provider, Replacement Service Provider as may be required, to take over the obligations of MSI in relation to the execution/continued execution of the requirements of the Contract.

52.2 Where the termination of the Contract is prior to its stipulated term on account of a default on the part of MSI or due to the fact that the survival of MSI as an independent corporate entity is threatened/has ceased, or for any other reason, whatsoever, the Authority, through unilateral re-determination of the consideration payable to MSI, shall pay MSI for that part of the Services which have been authorized by the Authority and satisfactorily performed by MSI up to the date of termination. Without prejudice to any other rights, the Authority may retain such amounts from the payment due and payable by the Authority to MSI as may be required to offset any losses caused to the Authority as a result of any acts of omissions or commission by MSI. In case of any loss or damage due to default or inability on the part of MSI in performing any of its obligations with regard to executing the Schedule of Requirements under the Contract, MSI shall compensate the Authority for any such loss, damages or other costs, incurred by the Authority. Additionally, members of its team shall continue performing all its obligations and responsibilities under the Contract in an identical manner as were being performed before the default occurred due to acts of MSI as described above in order to execute an effective transition and to maintain business continuity. All third parties shall continue to perform all/any functions as stipulated by the Authority and as may be proper and necessary to execute the Schedule of Requirements under the Contract in terms of MSI's Bid, the Bid Document and the Contract.

52.3 Nothing herein shall restrict the right of the Authority to invoke the Bank Guarantee and other guarantees furnished hereunder and pursue such other rights and/or remedies that may be available to the Authority under the Applicable Law.

52.4 The termination hereof shall not affect any accrued right or liability of either Party nor affect the operation of the provisions of the Contract that are expressly or by implication intended to come into or continue in force on or after such termination.

52.5 Upon termination or after expiration of Contract, MSI shall forthwith return to the Authority, all papers, material and other properties held by/provided to MSI during the Term of the Contract, including all Confidential Information and proprietary information provided to MSI for its use during the Project.

53. Miscellaneous

53.1 Under this Contract, the relationship between the Parties is that of independent contractors and no other relationship is intended, including a partnership, franchise,

joint venture, agency, employee/employer, fiduciary, master/servant relationship, or other special relationship. Neither Party shall act in a manner, which expresses or implies a relationship other than that of independent contractors, nor bind the other Party. MSI and the Sub-contractor shall take care of all liabilities, statutory or otherwise, in relation to persons employed by it or otherwise and the Authority shall not be responsible for the same in any manner whatsoever.

53.2 MSI or any of its Affiliates shall not directly or indirectly, solicit for employment or engagement any employees of the Authority. The provisions of this clause shall be applicable during the Term of the Contract and shall survive the termination of the Contract for a period of 2 years from the date of termination. In addition, MSI shall not proceed to conduct operations/business similar to the Authority with any employee and/or consultant of the Authority who has knowledge of the Confidential Information, without the prior written consent of the Authority.

53.3 It is also agreed between the Parties that the Authority is under no obligation, whatsoever, to procure Services/execute Works from MSI alone. By executing the Contract, the Authority does not commit/guarantee any minimum amount of payments due to MSI for the Services/Works performed by MSI and holds the right to increase or decrease the Scope of Work provided under the Contract and in these cases, the Parties shall mutually agree upon any amendment to the charges which are payable to MSI for the Works/Services performed.

53.4 The Authority reserves the right to propose amendment or modification, of the terms of the Contract or any part of it by giving MSI a notice in writing. No variation, amendment, modification or addition to the Contract shall be effective or binding on either of the Parties unless set forth in writing and executed by them through their authorized representatives.

53.5 The Contract shall be governed by and construed in accordance with the laws of India. The Parties agree to accept the non-exclusive jurisdiction of the competent courts of Agartala.

53.6 The Contract sets forth the entire agreement and understanding between the Parties as to the subject matter therein and shall supersede and override all previous communications, negotiations, commitments, agreements, and understandings, either oral or written, between the Parties with respect to the subject matter of the Contract.

53.7 **Notice**

I. Unless otherwise provided herein, all notices or other communications to be given pursuant to the Contract shall be made in writing, in English and by letter/email (save as otherwise stated) and shall be deemed to be duly given or made, in the case of personal delivery of the letter, when delivered; in the case of email, when sent, or, in the case of a letter, 3 (three) Business Days after being deposited in the post (by registered post, with acknowledgment due), postage prepaid, to such Party at its address or facsimile number specified herein or at such other address or facsimile number as such party may hereafter specify for such purposes to the other by notice in writing.

The addresses referred to above are:

a) In the case of a notice to the Authority:

Address : [●]

Attention : [●]

Telephone : [●]

Email : [●]

b) In the case of the MSI

Address : [●]

Attention : [●]

Email : [●]

c) In the case of the Subcontractor (if applicable):

Address : [●]

Attention : [●]

Email : [●]

II. A notice or other communication received on a day other than a Business Day, or after business hours in the place of receipt, shall be deemed to be given on the next following Business Day in such place.

III. The address or email address for serving notices can be changed by any Party by properly serving notices on the other Parties informing them of the changes of address.

IV. In the event that a Party refuses delivery or acceptance of a notice, request or other communication, under the Contract, it shall be deemed that the notice was given upon proof of the refused delivery, provided the same was sent in the manner specified in the Contract.

53.8 No failure by either party to enforce any rights hereunder shall be construed as a waiver of such right(s).

53.9 If any provision of the Contract is held to be inoperative or unenforceable as applied in any particular case because it conflicts with any other provision hereof or any statute, ordinance, rule of law or public policy, or for any other reason, such holding shall not have the effect of rendering the provision in question inoperative or unenforceable in any other case, or of rendering any other provision herein contained inoperative or unenforceable to any extent whatsoever. The invalidity of any one or

more phrases, sentences or Clauses contained in the Contract shall not affect the remaining portions of the Contractor any part hereof, and they shall otherwise remain in full force and effect.

53.10 Neither MSI nor its employees or its Subcontractor shall have the right, power, or authority to create any contract or obligation, express or implied, on behalf or, in the name of or binding on Authority.

53.11 The rights and obligations under the Contract are personal to MSI and shall not be assigned by it, to any third party, without the express prior written authorization of the Authority.

54. Change Control Note (CCN)

54.1 This applies to and describes the procedure to be followed in the event of any proposed change to Contract, site Implementation, and Service levels. Such change shall include, but shall not be limited to, changes in the scope of services provided by MSI and changes to the terms of payment.

54.2 Change requests in respect of the Contract, the site implementation, or the Service levels shall emanate from the Parties' representative who shall be responsible for obtaining approval for the change and who shall act as its sponsor throughout the Change Control Process and shall complete Part A of the CCN (Annex I, Section 3 of the RFP). CCNs shall be presented to the other Party's representative who shall acknowledge receipt by signature of the authorized representative of the Authority.

54.3 MSI and the Authority while preparing the CCN, shall consider the change in the context of whether the change is beyond the scope of Services including ancillary and concomitant services required. The CCN shall be applicable for the items which are beyond the stated/implied scope of work as per the RFP document.

54.4 MSI shall assess the CCN and complete Part B of the CCN. In completing Part B of the CCN MSI shall provide as a minimum:

a. a description of the change;

b. a list of Deliverables required for implementing the change;

c. a timetable for implementation;

d. an estimate of any proposed change; or any relevant acceptance criteria;

e. an assessment of the value of the proposed change;

f. Material evidence to prove that the proposed change is not already covered within the scope of the RFP, Contract and Service Levels.

54.5 Prior to submission of the completed CCN to the Authority or its nominated agencies, MSI shall undertake its own internal review of the proposal and obtain all necessary internal approvals. As a part of this internal review process, MSI shall consider the materiality of the proposed change in the context of the Contract, the sites, Service levels affected by the change and the total effect that may arise from implementation of the change.

54.6 Each Party shall be responsible for its own costs incurred in the quotation, preparation of CCNs and in the completion of its obligations described in this process provided MSI meets the obligations as set in the CCN. In the event MSI is unable to meet the obligations as defined in the CCN then the cost of getting it done by third party shall be borne by MSI. Change requests and CCNs shall be reported monthly to each Party's representative who shall prioritize and review progress.

C. PART C – SERVICE LEVELS

55. Purpose of Service Levels

55.1 The purpose is to define/measure the levels of the Service provided by MSI to the Authority for the duration of the Contract. The benefits of this are:

a. Implement a process to define Service level parameters or permissible threshold within which MSI would be required to perform the Services, and failure of performing the Services by MSI within the said acceptable parameters would be considered as a deficiency in Services;

b. help the Authority control the levels and performance of MSI's Services; and

c. alert MSI to improve its Services and/or remove deficiencies in Services in case the Service Levels agreed between the Authority and MSI are breached by MSI

56. Service Level Agreements & Targets

56.1 This section is agreed to by Authority and MSI as the key performance indicator for the Project. This may be reviewed and revised according to the procedures detailed in Clause 69 (Service Level Change Control).

56.2 The following section reflects the measurements to be used to track and report system's performance on a regular basis. The targets shown in the following tables are for the period of Contact.

56.3 The procedures in Clause 34 shall be used if there is a dispute between Authority and MSI on what the permanent targets should be.

57. General principles of Service Level Agreements

The Service Level Agreements have been logically segregated in the following categories:

58. Service Level Agreements (SLA)

58.1 SLA shall become the part of Contract between ASCL and the MSI. SLA defines the terms of the MSI's responsibility in ensuring the timely delivery of the Deliverables and the correctness of the same based on the agreed Performance Indicators as detailed in this section.

58.2 The MSI has to comply with service level requirements to ensure adherence to Project Timelines, quality and availability of services, throughout the period of this Contract i.e. for a period of 5.5 years including implementation phase. The MSI has to supply appropriate software/hardware/automated tools as may be required to monitor and submit reports of all the SLAs mentioned in this section.

58.3 For purposes of the SLA, the definitions and terms as specified in the Document along with the following terms shall have the meanings set forth below:

i. "**Total Time**" - Total number of hours in the quarter (or the concerned period) being considered for evaluation of SLA performance.

ii. "**Uptime**" – Time period for which the specified services/outcomes are available in the period being considered for evaluation of SLA. Formulae for calculation of Uptime: Uptime (%) = {1-[(Downtime)/(Total time- scheduled maintenance time)]}*100

iii. "**Downtime**"- Time period for which the specified services/components/outcomes are not available in the concerned period, being considered for evaluation of SLA, which would exclude downtime owing to Force Majeure & Reasons beyond control of the successful bidder.

iv. "**Scheduled Maintenance Time**" - Time period for which the specified services/components with specified technical and service standards are not available due to scheduled maintenance activity. The successful bidder is required to take at least 10 days prior approval from ASCL for any such activity. The scheduled maintenance should be carried out during non-peak hours (like post mid-night, and should not be for more than 4 hours. Such planned downtime would be granted max 4 times a year.

v. "**Incident**" - Any event/abnormalities in the service being rendered, that may lead to disruption in normal operations and services to the end user.

vi. "**Response Time**" - Time elapsed from the moment an incident is reported in the Helpdesk over phone or by any applicable mode of communication, to the time when a resource is assigned for the resolution of the same.

vii. "**Resolution Time**" - Time elapsed from the moment incident is reported to Helpdesk either in person or automatically through system, to the time by which the incident is resolved completely and services as promised are restored.

59. Measurement of SLA

59.1 The SLA metrics provided specifies performance parameters as baseline performance, lower performance and breach. All SLA calculations will be done on quarterly basis.

59.2 The SLA also specifies the liquidated damages for lower performance and breach conditions.

59.3 Payment to the MSI is linked to the compliance with the SLA metrics. The matrix specifies three levels of performance, namely:

a. The MSI will get 100% of the Contracted value if all the baseline performance metrics are compiled and the cumulative credit points are 100;

b. The MSI will get lesser payment in case of the lower performance. (For e.g. if SLA point score is 80 then the MSI will get 20% less on the quarterly payment – The formula calculating the deductions is "(100 – SLA Point Score)%")

c. If the performance of the Agency in respect of any parameter falls below the prescribed lower performance limit, debit points are imposed for the breach.

59.4 The credit (+) points earned during the quarter will be considered for computing penalty. The quarterly payment shall be made after deducting the liquidated damages as mentioned above.

59.5 The aforementioned SLA parameters shall be measured as per the individual SLA parameter requirements and measurement methods, through appropriate SLA

Measurement tools to be provided by the MSI and approved and audited by ASCL or its appointed Consultant for accuracy and reliability.

59.6 ASCL shall also have the right to conduct, either itself or through any other agency as it may deem fit, an audit / revision of the SLA parameters. The SLAs defined, shall be reviewed by ASCL on an annual basis after consulting the MSI, Project Management Consultants and other experts. All the changes would be made by ASCL after consultation with the MSI and might include some corrections to reduce undue relaxation in Service Levels or some corrections to avoid unrealistic imposition of liquidated damages, which are noticed after project has gone live.

59.7 Total liquidated damages to be levied on the MSI shall be capped at 10% of the total contract value. However, ASCL would have right to invoke termination of the Contract in case the overall liquidated damages equals 10% of total contract value. Liquidated damages to be levied during Post Implementation period shall be capped at 10% of the OPEX value. ASCL would also have right to invoke termination of Contract in case cumulative debit point (breach points) are above 30 in 2 consecutive quarters.

60. Pre Implementation SLA

Timely delivery of the Scope of Work shall be as under:

Definition	**Timely delivery of Deliverables would comprise entire bill of material and the application systems, and as per successful UAT of the same.**
Service Level Requirement	All the Deliverables defined in the Contract has to be submitted on-time on the date as mentioned in the Contract with no delay.
Measurement of Service Level Parameter	To be measured in Number of weeks of delay from the timelines mentioned in the section “Project Timelines”
Penalty for non-achievement of SLA Requirement	Any delay in the delivery of the Project Deliverables (solely attributable to vendor) would attract a liquidated damage per week of 0.2% of the CAPEX of Contract / Request Order value per week for first 8 weeks and 0.3% per week for every subsequent week. If the liquidated damage reaches 10% of the total Contract value, Authority may invoke termination clause. Liquidated Damage will be computed on Capex value of Contract/ Request order value of the particular phase

61. SLA Matrix for Post Implementation SLAs

61.1 These SLAs shall be used to evaluate the performance of the Services on monthly basis.

61.2 Penalty levied for non- performance as per SLA requirements shall be deducted through subsequent payments due from ASCL or through the Performance Bank Guarantee.

61.3 The SLA parameters shall be measured for each of the sub systems' SLA parameter requirements and measurement methods, through appropriate SLA measurement tools. All such required tools should be provided by the MSI. ASCL will have the authority to audit these tools for accuracy and reliability.

61.4 The upper limit of penalty would be capped at 10% of the opex value for each quarter. In case the calculated penalty crosses 10% penalty of the opex value in 2 subsequent quarters, ASCL reserves the right to invoke the termination clause.

61.5 SLAs for street IT infrastructure such as CCTV Cameras, MDVR, ANPR Cameras, Intelligent Traffic Signals, Traffic Detectors, Sensors & Controllers, Red Light Violation detection system (RLVD), Variable Message Display (VMD) boards, E-Challan Handheld Devices, Environmental Sensors, GPS based Vehicle Tracking System, Passenger Information System – LED Display boards, RFID Reader and Tags, E-Challan Handheld Devices, Environmental Sensors, Other equipment etc.

#	Uptime SLA (Monthly)	Penalty Clause
1	Uptime >= 98%	No Deduction
2	Uptime <98%	(98%- Uptime %) of monthly Operational Expense for the component. For example if uptime of component is 95%, then penalty imposed will be 98%%-95% i.e. 3% of operational expense.

61.6 SLAs for Network Availability for all GPRS enabled equipment and other connectivity for equipment including Variable Message Display boards, GPS Unit, Passenger Information System, Environmental Sensors, MDVRs, E-Challan Handheld Devices etc.

#	Uptime SLA (Monthly)	Penalty Clause
1	Uptime >= 95%	No Deduction
2	Uptime < 95%	(95%- Uptime %) of monthly Operational Expense for the component.

61.7 **SLAs for Network Quality of Service**

#	SLA (Monthly)	Penalty Clause
1	99% throughput of minimum stipulated bandwidth during 24*7 hours	No Deduction
2	≥97% and <99% throughput of minimum stipulated bandwidth during	1.0% deduction from Quarterly Operational Payment

	24*7 hours	
3	<97% throughput of minimum stipulated bandwidth during 24*7 hours	2.0% deduction from Quarterly Operational Payment
4	Average Packet loss exceeding 0.5% over a month (at Data Center and WAN level)	0.5% deduction from Quarterly Operational Payment
5	Latency Delay > 150 ms (every instance) (at Data Center and WAN level)	0.5% deduction from Quarterly Operational Payment

61.8 **SLAs for IT Infrastructure including software applications, hardware, video walls, workstations and other equipment of ICCC.**

#	Performance Area	Baseline		Lower Performance	Breach		
		Metric	Points	Metric	Points	Metric	Points
1. Application Performance (includes any user/system application related to the project)							
1	Overall application(s) availability – Command & Control Center	99%	40	>= 96.5 % to <99%	20	< 96.5 %	0
2	Reports Generation Response Time (Alerts/MIS/Logs etc.)	Simple query - < 5secs Medium complexity query - <30 secs High Complexity query - < 1min	5	Simple complexity Query = 5.01 – 10 secs Medium complexity query = 30.01 – 60 secs High Complexity query = < 60.1 sec – 2 min	2.5	Simple complexity Query = > 10 secs Medium complexity query = > 60 secs High Complexity query = > 2 min	0
3	Maximum time for successful settings	< 4 secs	5	4.01 – 6.0 secs	2.5	>6 secs	0

	modification of field devices						
2. **End-User Equipment Uptime**							
1	Monitoring workstations at Command Centers	99%	15	>= 96 % to <99%	7.5	< 96 %	0
2	IP Phones	98%	10	>= 96 % to <98%	5	< 96 %	0
3	Video Wall	99%	25	>= 96 % to <99%	12.5	< 96 %	0
	Total Score		**100**		**50**		**0**

61.9 **SLA for Video Analytics Performance**

#	Parameter	Penalty Clause
1	ANPR for Standard Roman Number plates (2 wheelers & above): 80% accuracy	Rs. 1000/- per wrongly identified regd. Number plate below the prescribed limit of SLA
2	ANPR for Non-Standard Roman Number plates (2 wheelers & above): 60% accuracy	Rs. 500/- per wrongly identified regd. Number plate below the prescribed limit of SLA

61.10 **SLA and Penalty for Helpdesk Response and Resolution time**

#	Parameter	Penalty Clause
1	For <= 1% of the calls not getting responded in less than or equal to 60 seconds per quarter	No Deduction
2	For > 1% of the calls not getting responded in less than or equal to 60 seconds per quarter	0.5% of the monthly opex value

61.11 **SLA for Change Requests or enhancements**

#	Parameter	Metric	Frequency	Penalty
1	Criticality of Change – **Low**	< T, where T is the timeframe for completion of the Change request as agreed upon by ASCL and successful bidder	Weekly per Occurrence	1 % of change request value per week for the first two weeks for each occurrence, 2 % of change request value per week for every subsequent week, subject to a maximum of 10% post which ASCL may invoke annulment of the contract.

2	Criticality of Change – **Medium**	< T, where T is the timeframe for completion of the Change request as agreed upon by ASCL and successful bidder	Weekly per Occurrence	1.5 % of change request value per week for the first two weeks for each occurrence, 2.5 % of change request value per week for every subsequent week, subject to a maximum of 10% post which ASCL may invoke annulment of the contract.
3	Criticality of Change – **High**	< T weeks, where T is the timeframe for completion of the Change request as agreed upon by ASCL and successful bidder	Weekly per Occurrence	2 % of change request value per week for the first two weeks for each occurrence, 3 % of change request value per week for every subsequent week, subject to a maximum of 10% post which ASCL may invoke annulment of the Contract.

62. SLA for issue resolution

#	Parameter	Metric	Frequency	Penalty
1	Severity 1 Issue	Resolution Time: <= 8 Hrs from the time the call is logged by end user.	Daily	0.1% of monthly opex value per week for the first two weeks for each occurrence, 0.2% of monthly opex value per week for every subsequent week, subject to a maximum of 10% post which ASCL may invoke annulment of the contract.
2	Severity 2 Issue	Resolution Time: <= 4 Days from the time the call	Daily	0.1% of monthly opex value per week for the first

		is logged by end user.		two weeks for each occurrence, 0.2% of monthly opex value per week for every subsequent week, subject to a maximum of 10% post which ASCL may invoke annulment of the Contract.
3	Severity 3 Issue	Resolution Time: <= 10 Days from the time the call is logged by end user.	Daily	0.1% of monthly opex value per week for the first two weeks for each occurrence, 0.2% of monthly opex value per week for every subsequent week, subject to a maximum of 10% post which ASCL may invoke annulment of the Contract.
4	Severity 4 Issue	Resolution Time: <= 20 Days from the time the call is logged by end user.	Daily	0.1% of monthly opex value per week for the first two weeks for each occurrence, 0.2% of monthly opex value per week for every subsequent week, subject to a maximum of 10% post which ASCL may invoke annulment of the contract.

63. Miscellaneous SLAs

#	Parameter	Metric	Frequency	Penalty
1	Compliance in document versioning and maintenance (FRS, SRS, Business Blue Prints, User Training Manual etc.), application version control, updates & patches etc.	100% as per requirement timelines	Daily per occurrence	Rs.10,000 per occurrence per day of delay.
2	Manpower Availability & Readiness	100% as per requirement timelines	Daily	Rs. 10,000 per day in case there is shortage in manpower deployment or lack of adequate skills
3	Scheduled downtime for System Maintenance per week	<= 2 times per month	Per Occurrence	Rs. 1,00,000 per occurrence for unscheduled downtime or scheduled downtimes exceeding the specified metric.
4	Resource Replacement	Within 7 days of exit of resource (in case of ASCL initiated or supplier initiated)	Per Occurrence	Rs. 5,000.00 per day of unavailability of resource
5	Application Security	Cyber Crime/Hacking/ Data Theft/Fraud attributable to the service provider	Per Occurrence	Depending on the type of incident and its impact, a Penalty of 10% on the entire contract value or in case of severe issue (as defined by ASCL) such breach may lead to termination of contract

64. Operational SLAs

i. The proposed storage for all the production related applications should be on latest generation technology. The latency of storage should always be less than 1ms for all transactions.

ii. The proposed solution for backup should be cost optimized to provide lowest cost per TB of capacity. It should provide flexibility to schedule policy and retention levels as required and mandated from time to time.

iii. The proposed backup solution should include features like deduplication, compression and encryption. The proposed backup solution should also allow flexibility to migrate the backups from one CSP to another CSP without needing to de-duplicate, compress and encrypt the data again.

65. Definitions:

i. Severity 1: ICCC or Smart City applications down for more than 70% users.
ii. Severity 2: ICCC or Smart City applications down for more than 30% users.
iii. Severity 3: Modules of ICCC not functional for users.
iv. Severity 4: Minor functionality issues with ICCC or Smart City applications
v. Response Time: Response time is defined as the time the support vendor takes to respond from the time that ticket was raised.
vi. Resolution Time: Resolution time is defined as the time the vendor takes to resolve the issue or provide acceptable workaround for the issue.

66. Conditions for No Penalties

a. Penalties shall not be levied on the Bidder in the following cases:

i. There is a Force Majeure event effecting the SLA which is beyond the control of the MSI. Force Majeure events shall be considered in line with the clause mentioned RFP.
ii. The non-compliance to the SLA has been due
iii. To reasons beyond the control of the successful bidder.
iv. Theft cases by default/vandalism would not be considered as “beyond the control of MSI”. Hence, the MSI should be taking adequate anti-theft measures, spares strategy, Insurance as required to maintain the desired Required SLA.

67. Reporting Procedures

67.1 MSI representative shall prepare and distribute Service level Performance Reports in a mutually agreed format by the 5th working day of subsequent month. The Reports shall include “actual versus target” Service Level Performance, a variance analysis and discussion of appropriate issues or significant events. Performance Reports shall be distributed to Authority management personnel as directed by Authority.

67.2 Also, MSI may be required to get the Service Level Performance Report audited by a third-party Auditor appointed by the Authority.

68. Issue Management Procedures

68.1 General

a. This process provides an appropriate management structure for the orderly consideration and resolution of business and operational issues in the event that quick consensus is not reached between Authority and MSI.

b. Implementing such a process at the beginning of the outsourcing engagement significantly improves the probability of successful issue resolution. It is expected that this pre-defined process shall only be used on an exception basis if issues are not resolved at lower management levels.

68.2 Issue Management Process

a. Either Authority or MSI may raise an issue by documenting the business or technical problem, which presents a reasonably objective summary of both points of view and identifies specific points of disagreement with possible solutions.

b. Any unresolved issues/disputes concerning the Project/Contract between the Parties shall first be referred in writing to the Project Manager for his consideration and resolution. If the Project Manager is unable to resolve any issue/dispute within 5 days of reference to him, the Project Manager shall refer the matter to the Program Management Committee If the Program Management Committee is unable to resolve the issues/disputes referred to them within 15 days, the unresolved issue/dispute shall be referred to Steering Committee/High Powered Committee/Project Implementation Committee for resolution. The Steering Committee or the High Powered Committee / Project Implementation Committee within 30 days of reference to them shall try to resolve the issue/dispute.

c. If the Steering Committee or the High Powered Committee / Project Implementation Committee fails to resolve a dispute as per the above clause, the same shall be referred to arbitration. The arbitration proceedings shall be carried out as per the Arbitration procedures mentioned in Clause 34 of this of RFP.

69. Service Level Change Control

69.1 General

a. It is acknowledged that this Service levels may change as Authority's business needs evolve over the course of the Contract period. As such, this document also defines the following management procedures:

   i. A process for negotiating changes to the Service Levels

   ii. An issue management process for documenting and resolving particularly difficult issues.

   iii. Authority and MSI management escalation process to be used in the event that an issue is not being resolved in a timely manner by the lowest possible level of management.

b. Any changes to the levels of service provided during the Term of the Contract shall be requested, documented and negotiated in good faith by both Parties. Either Party can request a change.

c. Service Level Change Process: The Parties may amend Service Level by mutual agreement. Changes can be proposed by either Party .Unresolved issues shall also be addressed. MSI's representative shall maintain and distribute current copies of

the Service Level document as directed by Authority. Additional copies of the current Service Levels shall be available at all times to authorized parties.

d. Version Control/Release Management: All negotiated changes shall require changing the version control number. As appropriate, minor changes may be accumulated for periodic release or for release when a critical threshold of change has occurred.

ANNEXURES

Annexure I: Change Control Note

Change Control Note	**CCN Number:**
Part A: Initiation	
Title	
Originator	
Sponsor	
Date of Initiation	
Details of Proposed Change	
(To include reason for change and appropriate details/specifications. Identify any attachments as A1, A2, and A3 etc.)	
Authorized by Authority	Date
Name	
Signature	
Received by the Bidder	Date
Name	
Signature	
Change	
Change Control Note	**CCN Number:**
Part B: Evaluation	
(Identify any attachments as B1, B2, and B3 etc.) Changes to Services, payment terms, payment profile, documentation, training, service levels and component working arrangements and any other contractual issue.	
Brief Description of Solution:	
Deliverables:	
Timetable:	
Charges for Implementation:	
Other Relevant Information: (including value-added and acceptance criteria)	
Authorized by Authority	Date
Name	
Signature	
Change Control Note	**CCN Number:**
Part C: Authority to Proceed	
Implementation of this CCN as submitted in Part A, in accordance with Part B is: (tick as appropriate)	
Approved	
Rejected	
Requires Further Information (as follows, or as Attachment 1 etc.)	
For Authority and its nominated agencies	**For MSI**
Signature	Signature
Name	Name
Title	Title
Date	Date

Annexure II: FORM OF AGREEMENT

This Agreement (hereinafter "Framework Agreement") made on this _____day of _____, 2018 BETWEEN Agartala Smart City Limited (hereinafter referred to as the **"Authority",** which expression shall include its successors and assigns) of the One Part;
AND
_____ (hereinafter referred to as the "**MSI**" which expression shall include its successors and assigns) of the Other Part.
AND WHEREAS, the Authority invited bids for the selection of Master System Integrator (MSI) for implementation of Integrated Command & Control Center (ICCC) in Agartala City.

AND WHEREAS, pursuant to the bid submitted by the MSI, vide _____ (here in after referred to as the "Bid or Offer") for the execution of Works, the Authority by its Letter of Acceptance dated _____ accepted the offer submitted by the MSI for the execution and completion of such Works as specified in the RFP documents and on the conditions in accordance with the documents listed in para 2 below.

AND WHEREAS, the MSI by a deed of undertaking dated _____ has agreed to abide by all the terms of the Bid, including but not limited to the amount quoted for the execution of Contract, as stated in the Bid, and also to comply with such terms and conditions as may be required from time to time.

AND WHEREAS, pursuant to the Bid submitted by the MSI vide _____ (hereinafter referred to as the "the Offer"), the Authority has by its Letter of Acceptance no. _____dated _____ accepted the Offer submitted by the MSI for the execution and completion of such Works and the remedying of any defects therein, on terms and conditions of the Framework Agreement;

AND WHEREAS, the MSI has agreed to undertake such Works and has furnished a Performance Bank Guarantee / PBG pursuant to clause 40 of the Section II.

NOW THIS AGREEMENT WITNESSETH as follows:

1. In this Framework Agreement words and expressions shall have the same meanings as are respectively assigned to them in the conditions of Contract hereinafter referred to;

2. The following documents shall be deemed to form and be read and constructed as part of this Framework Agreement viz. (a) Complete Request for Proposal (RFP) documents being Volumes I, II and III of the RFP and Corrigendum and addendum, (b) MSI's Offer, (c) Letter of Acceptance or Letter of Award OR Letter of Intent issued by the Authority, (d) the acceptance of Letter of Award from MSI, (e) Notice to Proceed with the Work, and (f) Any other document listed in the Contract Data.

3. The foregoing documents shall be constructed as complementary and mutually explanatory one with another. Should any ambiguities or discrepancy be noted then the order of precedence of these documents shall subject to the condition of particular application be as follows:

(a) Complete Request for Proposal (RFP) documents being Volumes I, II and III of the RFP and Corrigendum and addendum, (b) Framework Agreement, (c) MSI's Offer, (d) Letter of Acceptance or Letter of Award or Letter of Intent issued by the Authority, (e) the acceptance

of Letter of Award from MSI, (f) Notice to Proceed with the Work, and (g) Any other document listed in the Contract Data.

4. In consideration of the payments to be made by the Authority to the MSI as hereinafter mentioned, the MSI hereby covenants with the Authority to execute and complete the Works and remedy any defects therein in conformity in all respect with the provisions of the Contract.

5. the Authority hereby covenants to pay the MSI in consideration of the execution and completion of the Works and the remedying of defects therein the Contract price or such other sum as may become payable under the provisions of the Contract at the times and in the manner prescribed by the Contract.

IN WITNESS WHEREOF, the Parties here to have caused this Framework Agreement to be executed on the day and year first before written.

For and on behalf of	**For and on behalf of**
Agartala Smart City Limited	MSI (Company Name)
By……..	By……..
Signature	Signature
……..	……..
Print Name	Print Name
……..	……..
Title	Title
Witness……..	Witness……..
Print Name	Print Name
……..	……..
Print Address	Print Address
……..	……..

Annexure III: Non-Disclosure Agreement

This Non-Disclosure Agreement ("Agreement") is made and entered into **___ day of ……..., 2018** by and between

…….having its office at _____(hereinafter referred to as "Client"')

And

……..,having its office at _____(hereinafter referred to as :Master System Integrator" and/or "MSI")

"Client" and "MSI" shall be individually referred to as **Party** and collectively as **Parties** to this Agreement.

Whereas, the Parties have entered into a Contract bearing reference number _____ dated _____ for _____provision of _____ (hereinafter referred to as 'Contract'); and

Whereas, during the execution of the Contract, PARTIES may disclose to each other certain information which is confidential and proprietary in nature and as such they wish to protect such information from unauthorized disclosure and use;

NOW, THEREFORE, in consideration of the foregoing and the covenants and agreements contained herein and in the Contract, the Parties agree as follows:

1. **Definitions.** As used herein:

(a) The term "Confidential Information" shall include, without limitation, all information and materials, furnished by a Party ("Discloser") to another Party (Recipient) in connection with Government/corporates/citizen/users/persons/customers data, products and/or services, including information transmitted in writing, orally, visually, (e.g. video terminal display) or on magnetic or optical media, and including all proprietary information, customer & prospect lists, trade secrets, trade names or proposed trade names, methods and procedures of operation, commercial or marketing plans, licensed document know-how, ideas, concepts, designs, drawings, flow charts, diagrams, quality manuals, checklists, guidelines, processes, formulae, source code materials, specifications, programs, software packages, codes and other intellectual property relating to such Party's data, computer database, products and/or services. Confidential Information shall also include results of any tests, sample surveys, analytics, data mining exercises or usages etc. carried out by Discloser in connection with the Recipients' or any government department's / Corporates information including citizen/users/persons/customers personal or sensitive personal information as defined under any law for the time being in force.

(b) The term, "MSI" shall include the directors, officers, employees, agents, consultants, contractors and representatives of MSI including its affiliates, subsidiary companies and permitted assigns and successors.

2. **Protection of Confidential Information.** With respect to any Confidential Information disclosed by the Discloser to the Recipient or to which any Party has access, both the Parties agree that it shall:

(a) Use the Confidential Information only for accomplishment of the Services to be

performed under the Contract and in accordance with the terms and conditions contained herein;

(b) Maintain the Confidential Information in strict confidence and take all reasonable steps to enforce the confidentiality obligations imposed hereunder, but in no event take less than reasonable care than it takes to protect the confidentiality of its own proprietary and confidential information and that of its Clients;

(c) Not make or retain copy of any Confidential Information except as necessary, under prior written permission from other Party in connection with the Services to be performed under the Contract, and ensure that any such copy is immediately returned to the other Party even without express demand from such Party to do so;

(d) Not disclose or in any way assist or permit the disclosure of any Confidential Information to any person or entity without the express written consent of discloser except as provided in clause 6 below; and

(e) Return to Discloser, or destroy, at Discloser's direction, any and all Confidential Information disclosed in a printed form or other permanent record, or in any other tangible form (including without limitation, all copies, notes, extracts, analyses, studies, summaries, records and reproductions thereof) immediately upon the earlier to occur of:
(i) expiration or termination of the Contract, or
(ii) on request of Discloser.

(f) Not discuss with any member of public, media, press or any other person about the nature of arrangement entered between the Parties or the nature of services to be provided by the MASTER SYSTEM INTEGRATOR / MSI to the Authority/ CLIENT.

3. **Onus.** Recipient shall have the burden of proving that any disclosure or use inconsistent with the terms and conditions hereof falls within any of the exceptions provided in clause 4 below.

4. **Exceptions.** The obligations of confidentiality as mentioned in this Agreement shall not apply to any information:

(a) Which has become generally available to the public without breach of this Agreement by Recipient; or

(b) Which at the time of disclosure to Recipient was known to Recipient free of confidentiality restriction as evidenced by documentation in Recipient's possession;

or

(c) Which either Party agrees in writing is free of such confidentiality restrictions.

5. **Remedies.** The Parties acknowledge and agree that

(a) any actual or threatened unauthorized disclosure or use of the Confidential Information by Recipient would be a breach of this Agreement and may cause immediate and irreparable harm to Discloser;

(b) Damages from such unauthorized disclosure or use may be impossible to measure

accurately and injury sustained by Client may be impossible to calculate and remedy fully. Recipient acknowledges that in the event of such a breach or threatened breach of any provision of this Agreement, Discloser shall be entitled to specific performance by Recipient of Recipient's obligations contained in this Agreement. Recipient shall indemnify, save, hold harmless and defend Discloser promptly upon demand and at its expense, at any given point in time from and against any and all suits, proceedings, actions, demands, losses, claims, damages, liabilities, costs (including reasonable attorney's fees and disbursements) and expenses (collectively "Losses") to which Discloser may become subject to, in so far as such Losses arise out of, in any way relate to, or result from breach of obligations under this Agreement by Recipient . Such Party shall also be entitled, without the requirement of posting a bond or other security, to seek preliminary and final injunctive relief, as well as any and all other applicable remedies at law or equity, including the recovery of damages.

6. **Need to Know**. The Parties shall restrict disclosure of Confidential Information to its employees and/or consultants who have a need to know such information for accomplishment of Services under the Contract provided such employees and/or consultants have agreed to abide by the terms and conditions of this Agreement and agree that they shall not disclose such Confidential Information to any affiliates, subsidiaries, associates and/or third party without prior written approval of Discloser.

7. **Intellectual Property Rights Protection.** No license to Recipient, under any trademark, patent, copyright, design right, mask work protection right, or any other intellectual property right is either granted or implied by the conveying of Confidential Information to Recipient by the Discloser .

8. **No Conflict**. The Parties represent and warrant that the performance of their obligations hereunder do not and shall not conflict with any other agreement or obligation of the respective Parties to which they are a party or by which the respective Parties are bound.

9. **Authority.** The Parties represent and warrant that they have all necessary authority and power to enter into this Agreement and perform their obligations hereunder.

10. **Governing Law.** This Agreement shall be interpreted in accordance with and governed by the substantive and procedural laws of India and the Parties hereby consent to submit to the exclusive jurisdiction of Courts and/or Forums situated at AGARTALA, TRIPURA, INDIA only.

11. **Entire Agreement.** This Agreement constitutes the entire understanding and agreement of the Parties, and supersedes all previous or contemporaneous agreement or communications, both oral and written, representations and under standings among the Parties with respect to the subject matter hereof.

12. **Amendments.** No amendment, modification and/or discharge of this Agreement shall be valid or binding on the Parties unless made in writing and signed on behalf of each of the Parties by their respective duly authorized officers or representatives.

13. **Binding Agreement**. This Agreement shall be binding upon and inure to the benefit of the Parties hereto and their respective successors and permitted assigns.

14. **Severability**. It is the intent of the Parties that in case any one or more of the provisions contained in this Agreement shall be held to be invalid or unenforceable in any respect, such provision shall be modified to the extent necessary to render it, as modified, valid

and enforceable under Applicable Laws, and such invalidity or unenforceability shall not affect the other provisions of this Agreement.

15. **Waiver.** If either Party should waive any breach of any provision of this Agreement, it shall not thereby be deemed to have waived any preceding or succeeding breach of the same or any other provision hereof.

16. **Survival.** The Parties agree that all of their obligations undertaken herein with respect to Confidential Information received pursuant to this Agreement and obligations of indemnity shall survive for a period of 10 years after any expiration or termination of this Agreement.

17. **Non-solicitation.** During the term of this Agreement and thereafter for a further period of two (2) years post termination/expiry of Term of the Contract in case the Parties execute the Contract, the Parties shall not solicit or attempt to solicit each other's employees and/or consultants, for the purpose of hiring/contracting with such employees and/or consultants. In addition, MSI shall not proceed to conduct operations/business similar to the Client with any employee and/or consultant of the Client who has knowledge of the Confidential Information, without the prior written consent of the Client. This section will survive irrespective of the fact whether there exists a commercial relationship between MSI and Client.

18. **Term.** This Agreement shall come into force on the date first written above and, subject to aforesaid clause 16, shall remain valid up to two (2) years from the expiry or termination of the Contract.

IN WITNESS HEREOF, and intending to be legally bound, the Parties have executed this Agreement to make it effective from the date and year first written above.

For CLIENT,	For: Master System Integrator
Name:	Name:
Title:	Title:

WITNESSES:

1.

2.