



**Expression of Interest Document for  
Selecting Agency for providing solution for AI based video analytics and traffic management**

**Ref No.:** F3.3(257)/RISL/PUR/2018/4667

**dated 23/08/2018**

**Unique Bid No.:** RIS1819RFP0001

**Procuring Authority**

Managing Director,  
RISL, First Floor, C-Block, Yojana Bhawan, Tilak  
Marg, C-Scheme, Jaipur-302005 (Rajasthan)

RajCOMP Info Services Limited (RISL)  
First Floor, Yojana Bhawan, C-Block, Tilak Marg, C-Scheme, Jaipur-302005 (Raj.)  
Phone: 0141- 5103902 Fax: 0141-2228701  
Web: <http://risl.rajasthan.gov.in>, Email: [anilsingh.risl@rajasthan.gov.in](mailto:anilsingh.risl@rajasthan.gov.in)

**ABBREVIATIONS & DEFINITIONS**

<b>Act</b>	The Rajasthan Transparency in Public Procurement Act, 2012 (Act No. 21 of 2012) and Rules thereto
<b>Authorised Signatory</b>	The bidder's representative/ officer vested (explicitly, implicitly, or through conduct) with the powers to commit the authorizing organization to a binding agreement. Also called signing officer/ authority having the Power of Attorney (PoA) from the competent authority of the respective Bidding firm.
<b>Bid/ eBid</b>	A formal offer made in pursuance of an invitation by a procuring entity and includes any tender, proposal or quotation in electronic format
<b>Bidder</b>	Any person/ firm/ agency/ company/ contractor/ supplier/ vendor participating in the procurement/ bidding process with the procurement entity
<b>Bidding Document</b>	Documents issued by the procuring entity, including any amendments thereto, that set out the terms and conditions of the given procurement and includes the invitation to bid
<b>BoM</b>	Bill of Material
<b>CMC</b>	Contract Monitoring Committee
<b>Competent Authority</b>	An authority or officer to whom the relevant administrative or financial powers have been delegated for taking decision in a matter relating to procurement. MD, RISL in this bidding document.
<b>Contract/ Procurement Contract</b>	A contract entered into between the procuring entity and a successful bidder concerning the subject matter of procurement
<b>Contract/ Project Period</b>	The Contract/ Project Period shall commence from the date of issue of Work order till 5 Years of Operations & Maintenance Services after Completion of FAT.
<b>COTS</b>	Commercial Off The Shelf Software
<b>Day</b>	A calendar day as per GoR/ GoI.
<b>DeitY, GoI</b>	Department of Electronics and Information Technology, Government of India
<b>DoIT&amp;C</b>	Department of Information Technology and Communications, Government of Rajasthan.
<b>ETDC</b>	Electronic Testing & Development Center
<b>FOR/ FOB</b>	Free on Board or Freight on Board
<b>GoI/ GoR</b>	Govt. of India/ Govt. of Rajasthan
<b>Goods</b>	All articles, material, commodities, electricity, livestock, furniture, fixtures, raw material, spares, instruments, software, machinery, equipment, industrial plant, vehicles, aircraft, ships, railway rolling stock and any other category of goods, whether in solid, liquid or gaseous form, purchased or otherwise acquired for the use of a procuring entity as well as services or works incidental to the supply of the goods if the value of services or works or both does not exceed that of the goods themselves
<b>ICT</b>	Information and Communication Technology.

<b>IFB</b>	Invitation for Bids (A document published by the procuring entity inviting Bids relating to the subject matter of procurement and any amendment thereto and includes notice inviting Bid and request for proposal)
<b>INR</b>	Indian Rupee
<b>ISI</b>	Indian Standards Institution
<b>ISO</b>	International Organisation for Standardisation
<b>IT</b>	Information Technology
<b>ITB</b>	Instruction to Bidders
<b>LD</b>	Liquidated Damages
<b>LoI</b>	Letter of Intent
<b>NCB</b>	A bidding process in which qualified bidders only from within India are allowed to participate
<b>NeGP</b>	National e-Governance Plan of Government of India, Department of Information Technology (DIT), Ministry of Communications and Information Technology (MCIT), New Delhi.
<b>NIB</b>	Notice Inviting Bid
<b>Notification</b>	A notification published in the Official Gazette
<b>OEM</b>	Original Equipment Manufacturer
<b>PAN</b>	Permanent Account Number
<b>PBG</b>	Performance Bank Guarantee
<b>PC</b>	Procurement/ Purchase Committee
<b>PQ</b>	Pre-Qualification
<b>Procurement Process</b>	The process of procurement extending from the issue of invitation to Bid till the award of the procurement contract or cancellation of the procurement process, as the case may be
<b>Procurement/ Public Procurement</b>	The acquisition by purchase, lease, license or otherwise of works, goods or services, including award of Public Private Partnership projects, by a procuring entity whether directly or through an agency with which a contract for procurement services is entered into, but does not include any acquisition without consideration, and “procure” or “procured” shall be construed accordingly
<b>Project Site</b>	Wherever applicable, means the designated place or places.
<b>PSD/ SD</b>	Performance Security Deposit/ Security Deposit
<b>Purchaser/ Tendering Authority/ Procuring Entity</b>	Person or entity that is a recipient of a good or service provided by a seller (bidder) under a purchase order or contract of sale. Also called buyer. RISL in this RFP document.
<b>RajSWAN/ RSWAN</b>	Rajasthan State Wide Area Network
<b>RISL</b>	RajCOMP Info Services Limited

<b>RSDC</b>	Rajasthan State Data Centre, New IT Building, Jaipur
<b>RVAT</b>	Rajasthan Value Added Tax
<b>Services</b>	Any subject matter of procurement other than goods or works and includes physical, maintenance, professional, intellectual, consultancy and advisory services or any service classified or declared as such by a procuring entity and does not include appointment of any person made by any procuring entity
<b>SLA</b>	Service Level Agreement is a negotiated agreement between two parties wherein one is the customer and the other is the service provider. It is a service contract where the level of service is formally defined. In practice, the term SLA is sometimes used to refer to the contracted delivery time (of the service) or performance.
<b>SSDG</b>	State Services Delivery Gateway
<b>State Government</b>	Government of Rajasthan (GoR)
<b>State Public Procurement Portal</b>	<a href="http://sppp.raj.nic.in">http://sppp.raj.nic.in</a>
<b>STQC</b>	Standardisation Testing and Quality Certification, Govt. of India
<b>Subject Matter of Procurement</b>	Any item of procurement whether in the form of goods, services or works
<b>TIN</b>	Tax Identification Number
<b>TPA</b>	Third Party Auditors
<b>VAT/ CenVAT</b>	Value Added Tax/ Central VAT
<b>WO/ PO</b>	Work Order/ Purchase Order

**1. NOTICE INVITING EXPRESSION OF INTEREST**



**RajCOMP Info Services Ltd.**  
(A Government of Rajasthan undertaking)

email: [info.risl@rajasthan.gov.in](mailto:info.risl@rajasthan.gov.in)  
website: [www.risl.rajasthan.gov.in](http://www.risl.rajasthan.gov.in)  
CIN : U72200RJ20105GC033185

**NOTICE INVITING EXPRESSION OF INTEREST**

Ref. No.:F3.3 (257)/RISL/PUR/2018/4667

Date: 23/08/2018

Unique Bid No. : RTS1819RFP0001

<b>Name &amp; Address of the Procuring Entity</b>	<ul style="list-style-type: none"> <li>Name: RajCOMP Info Services Limited (RISL)</li> <li>Address: First Floor, Yojana Bhawan, C-Block, Tilak Marg, C-Scheme, Jaipur-302005 (Rajasthan)</li> </ul>
<b>Name &amp; Address of the Project Officer In-charge (POIC)</b>	<ul style="list-style-type: none"> <li>Name: Anil Kumar Singh</li> <li>Designation: Group General Manager (Technical)</li> <li>Address: First Floor, Yojana Bhawan, C-Block, Tilak Marg, C-Scheme, Jaipur-302005 (Rajasthan)</li> <li>Email : <a href="mailto:anilsingh.risl@rajasthan.gov.in">anilsingh.risl@rajasthan.gov.in</a></li> </ul>
<b>Subject Matter of Procurement</b>	Expression of Interest Document for Selecting Agency for providing solution for AI based video analytics and traffic management
<b>Bid Procedure</b>	Two Stage Open competitive bidding process
<b>Websites for downloading Bidding Document, Corrigendum's, Addendums etc.</b>	<ul style="list-style-type: none"> <li>Websites: <a href="http://sppp.raj.nic.in">http://sppp.raj.nic.in</a>, <a href="http://eproc.rajasthan.gov.in">http://eproc.rajasthan.gov.in</a>, <a href="http://risl.rajasthan.gov.in">http://risl.rajasthan.gov.in</a> and <a href="http://www.doitc.rajasthan.gov.in/">http://www.doitc.rajasthan.gov.in/</a></li> </ul>
<b>(Start/ End Date)</b>	From 6:00 PM onwards on 24-08-2018 and up to 4:00 PM on 28-09-2018
<b>Manner, Start/ End Date for the submission of Bids</b>	<ul style="list-style-type: none"> <li>Manner: Online at eProc website (<a href="http://eproc.rajasthan.gov.in">http://eproc.rajasthan.gov.in</a>)</li> <li>Start Date: 17-09-2018</li> <li>End Date: 28-09-2018 up to 4:00 PM</li> </ul>
<b>Date/ Time/ Place of Bid Opening</b>	<ul style="list-style-type: none"> <li>Date: 28-09-2018</li> <li>Time: 5:00 PM</li> <li>Place: RISL, Board Room, First Floor, Yojana Bhawan, C-Block, Tilak Marg, C-Scheme, Jaipur-302005 (Rajasthan)</li> </ul>
<p>Note:</p> <ol style="list-style-type: none"> <li>Bidder (authorised signatory) shall submit their offer on-line in Electronic formats for proposal.</li> <li>To participate in online bidding process, Bidders must procure a Digital Signature Certificate (Type III) as per Information Technology Act-2000 using which they can digitally sign their electronic bids. Bidders can procure the same from any CCA approved certifying agency, i.e. TCS, Safecrypt, Neode etc. Bidders who already have a valid Digital Signature Certificate (DSC) need not procure a new DSC. Also, bidders must register on <a href="http://eproc.rajasthan.gov.in">http://eproc.rajasthan.gov.in</a> (bidders already registered on <a href="http://eproc.rajasthan.gov.in">http://eproc.rajasthan.gov.in</a> before 30-09-2011 must register again).</li> <li>RISL will not be responsible for delay in online submission due to any reason. For this, bidders are requested to upload the complete bid well advance in time so as to avoid 11th hour issues like slow speed; choking of web site due to heavy load or any other unforeseen problems.</li> <li>Bidders are also advised to refer "Bidders Manual Kit" available at e-Procurement website for further details about the e-Tendering process.</li> <li>Training for the bidders on the usage of e-Tendering System (e-Procurement) is also being arranged by DoIT&amp;C, GoR on a regular basis. Bidders interested for training may contact e-Procurement Cell, DoIT&amp;C for booking the training slot. Contact No: 0141-4022688 (Help desk 10 am to 6 pm on all working days) e-mail: <a href="mailto:eproc@rajasthan.gov.in">eproc@rajasthan.gov.in</a> Address : e-Procurement Cell, RISL, Yojana Bhawan, Tilak Marg, C-Scheme, Jaipur</li> </ol>	



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website: [www.risl.rajasthan.gov.in](http://www.risl.rajasthan.gov.in)  
CIN : U72200RJ20105GC033185

- 6) The procuring entity reserves the complete right to cancel the bid process and reject any or all of the Bids.
- 7) No contractual obligation whatsoever shall arise from the bidding document/ bidding process unless and until a formal contract is signed and executed between the procuring entity and the successful bidder.
- 8) Procurement entity disclaims any factual/ or other errors in the bidding document (the onus is purely on the individual bidders to verify such information) and the information provided therein are intended only to help the bidders to prepare a logical bid-proposal.
- 9) The provisions of RTPPA Act 2012 and Rules thereto shall be applicable for this procurement. Furthermore, in case of any inconsistency in any of the provisions of this bidding document with the RTPPA Act 2012 and Rules thereto, the later shall prevail.

  
**Managing Director**

## **2. PROJECT PROFILE & BACKGROUND INFORMATION**

RISL on behalf of Department of Information Technology & Communication, Government of Rajasthan intends to select an agency for Artificial Intelligence based video analytics and traffic management to increase efficiency of Abhay Command Center.

Artificial Intelligence(AI) is bringing human intelligence to everyday technologies. We are now able to form a relationship with our technology, use it to teach it about our behaviors and to improve how our businesses and communities operate.

AI is transforming how we operate and rely on technology, enabling humans to work more efficiently and effectively than ever before, making our jobs simpler, our efforts more calculated and our outputs more accurate. Whether technology is simplifying our everyday experiences or predicting what we will want next, it is bringing a deeply personal experience to us all.

Surveillance systems that include video analytics analyze video footage in real-time and detect abnormal activities that could pose a threat to residents in the cities of Rajasthan. Essentially, video analytics technology helps security software “learn” what is normal so it can identify unusual, and potentially harmful, behavior that a human alone may miss.

It does this in two ways; first by observing objects in a monitored environment and detecting when humans and vehicles are present, and second by taking operator feedback about the accuracy of various events and incorporating this intelligence into the system itself, thus improving its functionality. This interaction between operator and technology results in a “teachable” system: Artificial Intelligence at its best in the realm of security where ultimately, human oversight takes a backseat to the fine-tuned capabilities of intelligent video analytics.

Instead of depending solely on human monitoring, AI-powered systems notify security teams of potential threats as they happen, helping businesses prevent break-ins or illegal activity, as well as increasing human accuracy.

Artificial Intelligence helps people do their jobs better, thereby making our lives easier and our locations safer. Artificial Intelligence is making technology more personal and purposeful than ever before by securing our businesses, cities and homes.

As the amount of video data generated tends to be pretty huge, with no way to handle and process all of it in a short span of time using manpower alone due to limitations in human capacity, video analytics is serving as a useful asset to make generated video data more valuable.

RISL/DoIT&C is looking for a solution that has a comprised solution which is based on rule based, non rule based and Combination of rule and non rule based & machine learning.

This video analytic and Traffic Management solution would be helpful in increasing the working efficiency of Abhay Command Center and will help in proactive response to citizens.

This document is an Expression of Interest (EOI) for bidders to express their interest for providing AI based solution for video analytics and traffic management and Maintenance Support (O & M) for next five years after making it Go-Live. The interested bidders would be required to make presentations of their solution with detail including hardware required, server requirement, software license requirement, modules and detailed list of equipments/items with specification & makes required before the technical committee. The use cases for both video analytics and traffic management are also required to be presented. The Technical committee would evaluate the vendors on behalf of the presentation and other technical documents. The successful Bidder in the RFP shall do the supply, installation, configuration, commissioning, testing, training and support as per the specifications and the specified scope of work. The date, time and venue for making presentations would be communicated to the bidders after receiving EOI from interested bidders.

IT Infrastructure components such as Servers, Databases, Networking & Security components, Storage, Software and other IT components etc. required at the Data Centre would be provide by tendering authority.



### 3. EVALUATION CRITERIA

A bidder participating in the procurement process shall possess the following minimum pre-qualification/eligibility criteria.

S. No.	Basic Requirement	Specific Requirements	Documents Required
1	Legal Entity	The bidder should be a Proprietorship firm duly registered either under the Rajasthan Shops & Commercial Establishments Act, 1958 or any other Act of State/ Union, as applicable for dealing in the subject matter of procurement (Note: A self-certified declaration regarding the non-applicability of registration to any Act should be submitted by the bidder) OR A company registered under Indian Companies Act, 1956 OR A partnership firm registered under Indian Partnership Act, 1932.	- Copy of valid Registration Certificates  In case of company, Copy of Certificates of incorporation
2	Financial: Net Worth	The net worth of the bidder, as on 31 <sup>st</sup> March 2016, should be Positive. (In case of consortium, net worth of both consortium partner should be positive)	CA Certificate with CA's Registration Number/ Seal
3	Tax registration and clearance	The lead bidder should have a registered number of i. GSTN where his business is located ii. Income Tax / PAN number.	Copies of relevant certificates of registration
4	Mandatory Undertaking	Lead Bidder should: - a) not be insolvent, in receivership, bankrupt or being wound up, not have its affairs administered by a court or a judicial officer, not have its business activities suspended and must not be the subject of legal proceedings for any of the foregoing reasons; b) not have, and their directors and officers not have, been convicted of any criminal offence related to their professional conduct or the making of false statements or misrepresentations as to their qualifications to enter into a procurement contract within a period of three years preceding the commencement of the procurement process, or not have been otherwise disqualified pursuant to debarment proceedings; c) not have a conflict of interest in the procurement in question as specified in the bidding document. d) comply with the code of integrity as specified in the bidding document.	A Self Certified letter as per Annexure-5: Self-Declaration

#### **4. SCOPE OF WORK, DELIVERABLES & TIMELINES**

The selected bidder shall Supply, customize, install, integrate & commission complete video analytics and traffic management solution on hardware and software to be provided by RISL in state data center. The system is to be maintained for a period of 5 years from the date of signoff post successful completion of installation, commissioning and acceptance testing. The minimum specified work to be undertaken by the selected bidder for setting up and operating SDC has been categorized as under:

- a. Supply, Customization, Installation, Integration and Commissioning Phase
- b. Training phase
- c. Operation and Maintenance phase

##### **4.1 Supply, Customization, Installation, Integration and Commissioning phase**

The broad scope of work during this phase will include the following, but is not limited to:

- Project Kick off meeting
- Preparation and submission of Manpower Deployment plan and schedule with list of staff to be deployed under the project during different parts/stages of the project.
- Preparation and submission of schedules of supply, customization, Installation, integration and commissioning
- Supply of software and hardware as per proposed solution
- Customization, Installation, Integration and Commissioning of proposed solution for carrying out live Operations and getting the acceptance of the same from the tendering authority

##### **4.2 Training of Personnel**

The selected bidder shall be responsible for providing training to Police dept./ RISL personnel as mentioned in below table

S. No.	Module	Min. No. of Resources
1.	Video Analytics	100
2.	Traffic Management	50

##### **4.3 Operation & Maintenance Phase**

The following are the major activities to be carried out in O&M Phase for a period of 5 years from the date of signoff post successful completion of installation, commissioning and acceptance testing

- Support in calibration of any item required for video analytics
- Customization and configuration of solution as per change requested by department
- Providing SLA reports
- Providing Impact Assessment report in respect for Abhay Command Center after implementing solution

## 5. BIDDING PROCESS

- a. The complete EoI document shall be placed on e-Procurement portal. The prospective bidders shall be permitted to download the bidding document from the website.
- b. The EOI bids will be opened as per schedule mentioned in NIB.
- c. Bid Submission
  - i. Bidders must submit their bids online at e-Procurement portal i.e. <http://eproc.rajasthan.gov.in>.
  - ii. The response to EoI shall consist of following documents

S. No.	Document Type	Document format
1.	Bidder's Authorisation Certificate along with copy of PoA/ Board resolution stating that Auth. Signatory can sign the bid/ contract on behalf of the firm.	As per Annexure-3 (PDF)
2.	Technical Proposed Solution	As per Annexure-1 and Annexure-2 (PDF)
3.	Project References in AI Based Video Analytics	As per Annexure-4 (PDF)
4.	Bidder's Details	As per Annexure-5 (PDF)

- iii. The bidder should ensure that all the required documents, as mentioned in this bidding document, are submitted along with the Bid and in the prescribed format only. Non-submission of the required documents or submission of the documents in a different format/ contents may lead to the rejections of the Bid submitted by the bidder.
- iv. All the documents uploaded should be digitally signed with the DSC of authorized signatory.

## **ANNEXURE-1: TECHNICAL SOLUTION**

### **A. Artificial intelligence based Video Analytics Software (Rule based)**

1. Software shall be "Rule-based" so that a human programmer can set rules for all of the things for which the user wishes to be alerted.
2. Software shall be able to use rule based Artificial Intelligence to provide alerts and useful actionable insights from live streaming video feed data from minimum 3000 ONVIF Compliant cameras across Rajasthan thus increasing the efficiency of 24\*7 surveillance by Abhay Command and Control Center's and also provide analytics on pre-recorded videos.
3. The software should be able to differentiate and analyze the images from video surveillance cameras in order to recognize humans, vehicles, animals or objects.
4. Intrusion Detection:
  - a. Tripwire/Trespass: Detection of a person/vehicle crossing a virtual line or entering/exiting from a virtual defined area in the camera field of view(FoW).  
**Use Case:**
    - i. Crossing of railway lines
    - ii. Entering in to secured zone of bank, hospital etc.
    - iii. PCR Van of one police station roaming in area of second police station
  - b. Camera Tampering: Detection of camera tampering like video cable cut/ view obstruction/ change in focus and generating alert on same.
  - c. Auto PTZ focus: PTZ can focus on any intruder/site of incident and can follow him/ autofocus on site of incident.
  - d. Object Left/Removed: Detects when an object has been left unattended for user defined time and is not part of the normal scene, or when an object is removed.
  - e. Tailgating: Identification of a person or vehicle following too closely another person or vehicle to get unauthorised entrance to boom barriers or gated communities.  
**Use Case:** Unauthorized access to gated communities/mall entrances/legislative assembly etc.
  - f. Loitering Detection: Detects when a person has been in a specified area for more than a specified time.  
**Use Case:** People loitering in a mall after closing of mall.
5. Object Classification: Detects and classifies an object as a Human, Vehicle, animal etc. Reduces false detection from non-security related objects.
6. People Counting: To count the number of people with overhead as well as angular camera using machine learning to get accurate results. (Both in and out)  
**Use Case:** Number of people entering and exiting in to railway station/bus stand to avoid stampede.
7. Queue Management: It detects queue properties for waiting time analysis  
**Use Case:** Queue Management at railway ticket counter to improve services.
8. Crowd Management:  
Crowd Detection/Crowd Counting/Crowd Flow Detection:  
**Use case:**
  - a. Detecting illegal gathering of masses in malls/railway station/airports/public places
  - b. In festivals, fairs etc. crowd counting is used to manage crowd and take corrective action against overcrowding.
  - c. Tracking crowd movements in undesired directions and marking the same with different colors.
9. Video Smoke Detection/Fire Detection: Detection of smoke/fire with in 5 to 10 secs and covering 10 to 15% of area.
10. Detection of Water Spills: Detection of water spills on important areas.

11. Slip and Fall Detection: Detection of person slipping and falling on ground.
12. Gesture recognition: Detection of unusual behaviour of person raising weapons like lathi, rifle, running, attack, man-down etc.
13. Video Stitching: Stich video from 2 to 8 cameras and provide input to VMS as a single ONVIF Camera (Panoramic View).  
**Use Case:** In VIP movement to monitor a single straight road.
14. Video Summary: Reduces a long archived video to a short, manageable summary with actual events
15. Video Motion Detection : Detects valid motion, filtering out noise such as lighting changes and tree/animal movements.
16. People Tracking: Tracking specified person in multiple cameras based on object properties viz. Color of shirt/trouser, Spectacles, beard etc.
17. Traffic Management: It is to be integrated with existing e-challan system to generate e-challans.
  - a. Vehicle Counting: Counting of vehicles crossing a particular virtual line/gate.  
**Use case:** Traffic density calculation, waiting time analysis at toll plaza
  - b. Wrong way detection- Movement of vehicle in opposite direction  
**Use Case:** Generating e-challan against the vehicle which are entering/exiting from wrong way in underpass
  - c. No Parking Detection- Illegal parking in specified zone for beyond a specified period  
**Use Case:** Generating alert on Parking of a vehicle in a no parking area
  - d. Speed Violation Detection: Detection of speed of vehicle which is permissible as per Indian laws.  
**Use Case:** Generating e-challan against the over speeding vehicle in city/highways.
  - e. Red Light Violation: Detection of vehicle with ANPR which crosses red light and generating e-challan.  
**Use Case:** Vehicle crossing the road at the time of red light and generating e-challan.
  - f. Zebra Crossing : Generating e-challan if a vehicle cross zebra crossing.
  - g. Safety Helmet: Generating an e-challan if any citizen is not wearing helmet while driving vehicle on road.
  - h. Traffic Congestion detection: Generating alert if vehicles occupy more than defined area.  
**Use Case:** Detecting traffic Jams at major crossings in the city and to alert traffic police.
  - i. Smart Parking Management: Detecting entry and exit of vehicles and displaying free parking slot availability.  
**Use Case:** Displaying parking availability in public areas like Garden/ Malls etc.
  - j. Automatic Number Plate Recognition: Recognition of number plate even if partially visible. Extract the license number from registered number plate and matches the same with RTO database which will further help in generating e-challans.  
**Use case:** Detecting number plate of over speeding vehicle and generating e-challan as per registration details available in RTO database.
18. Facial Recognition:
  - Should be a deep learning and AI-based face detection, search and recognition solution that uses a stored database of faces to detect, recognize and record people's faces that appear in a camera's field of view for facial recognition.
  - It should analyze facial data more quickly by providing more accurate face detection with faster response time, thus creating a powerful method for facial recognition.
  - Should be able to match faces of live video feed with database size of 50000 persons.
  - Using AI and neural networks, facial recognition and detection should achieve accuracy of 99% on public databases, comparable to Google and Facebook. One or more persons in the scene should be identified against a stored database of faces in real-time or at a later date.

- The software should have following capabilities :
    - a. Detect and Log Faces : Faces are automatically detected and logged in the database for later forensic investigation.
    - b. Recognize Faces: Once enrolled in the database or present in a preloaded watch list, faces can be recognized and alerts provided.
    - c. Multiple Camera Support: Search for faces from a single camera or across multiple cameras.
    - d. Support for Large Database of Faces : Face database allows upv to 100K faces. Fast Recognition. Faces can be recognized in less than 1-2 seconds.
19. Using AI in video analytics, a number of systems should be able to communicate with each helping in taking decisions and readily catching suspicious activities or predicting them before they can happen. It should also have event and authorization-based alert systems, wherein, the alerts will be sent only to an authentic person and the relevant department.
20. Combining Video Analytics with Location and Identity-based Systems – There are some situations where a camera cannot take action due to some visual obstacle that is not included in camera tampering algorithms which means video analytics will not work. The situation can be beyond the line of sight. Combining video analytics with other advanced technologies, including Real-time Location Systems (RTLs) or Radio-frequency identification Systems (RFID), can provide the exact data or location.

#### **B. Artificial intelligence based Video Analytics Software (Non-Rule based)**

1. Software shall be able to use algorithms and **unsupervised deep learning methods** to provide alerts and useful actionable insights from live streaming video feed data from minimum 3000 ONVIF Compliant cameras across Rajasthan thus increasing the efficiency of 24\*7 surveillance by Abhay Command and Control Center's and also provide analytics on pre-recorded videos.
2. Software shall have minimum all the video analytics and traffic management features which are available in rule based and shall be able to create new rules.
3. Software shall be able to automatically find out major motion patterns without any human intervention
4. Software shall be able to define it's own rule for event detection as per algorithms and deep learning without any human intervention.
5. Software shall use Abnormal Behaviour Detection Algorithm which can make inference from various simultaneous motion patterns occurring in video based on their various patterns like motion, trajectories and time of the event.
6. Software shall have capability to automatically analyze hours of video data for defining own rule.
7. Software shall have following machine learning features for minimum 3000 cameras:
  - a. Anomaly Detection: Minimum 3000 cameras would use the algorithm to identify the variance from the normal activity and alerts the CCC based on the event. Configuration of rule is not required. The system learns on its own and create unique, abnormal events. Eg. Riots, fire, explosions etc.

##### **Use Case:**

One Way direction : If traffic is going in only one direction than software will learn the flow and will create an alert when a vehicle is coming in opposite direction with time consideration.

b. Pattern Identification:

The software should be capable of fully self-learning with no initial programming input by the end user. The solution should learn what is normal behaviour for people, vehicles, machines, and the environment based on its own observation of patterns of various characteristics such as size, speed, reflectivity, color, grouping, vertical or horizontal orientation and so forth.

The solution should normalize the visual data, meaning that it classifies and tags the objects and patterns it observes, building up continuously refined definitions of what is normal or average behaviour for the various observed objects. After several weeks of learning in this fashion it can recognize when things break the pattern. When it observes any such anomaly it should generate an alert to the authorized user.

Use cases:

There are many different approaches to solving the optical character recognition problem. One of the most common and popular approaches is based on neural networks, which can be applied to different tasks, such as pattern recognition, time series prediction, function approximation, clustering, etc

Car on Footpath: it is normal for motorcycle to drive in the street. A motorcycle seen driving up onto a footpath would be an anomaly.

Fencing: If a fenced yard is normally empty at night, then a person entering that area would be an anomaly.

8. Vehicle Counting and Classification

With the help of machine learning, software shall be able to classify type of vehicle like car, two-wheeler, truck along with counting, average speed etc..

9. Object Recognition:

Software shall be able to recognize and classify different object based on deep learning.

10. Gesture Recognition: Software shall be able to gestures and emotions based on face, hand and other parts of the body. Emotion recognition from face like "happy", "sad", "angry", "scared", "surprised" or "neutral" should form the basis of video analytics. The software should be able to transcribe the symbols represented through sign language into text. Software shall be able to analyze sounds from microphone installed in the city and can detect any abnormal behaviour

Use case: A large bamboo stick in hand of a person having anger emotion on face with loud sound shall be treated as an alert.

11. Integration with existing systems: Software shall be capable to integrate with existing video analytics system and Video management system to increase the coverage of cameras and provide additional benefit to CCC.

12. Warranty: 5 years comprehensive onsite OEM Warranty with all necessary update, upgrade and patches.

The Bidder is required to provide the proposed Technical Solution in the technical bid. Following should be described as part of technical solution:

- I. Clear articulation and description of the design and technical solution and various components including software make and version, make of equipment or sizing of infrastructure (including diagrams and calculations wherever applicable)
- II. Technical Design and clear articulation of benefits to Tendering authority of various components of the solution vis -à-vis other options available like scalability, cost benefit, low recurring cost etc.
- III. Strength of the Bidder to provide services including examples or case -studies of similar solutions deployed for other clients.
- IV. Use cases for which AI based solution has been developed.
- V. Bill of Material with quantity, make and model offered for proposed solution.
- VI. OEM's Proposed by bidder

The bidder should provide following as their technical solution:

- I. Implementation plan with timelines
- II. Requirement of Hardware and software in data center
- III. Compliance to the solution
- IV. Manpower deployment during FMS Period
- V. FAT plan alongwith documents to be submitted by bidder at the time of FAT and O&M
- VI. Project Reference in AI based Video Analytics
- VII. Any other recommendations



**ANNEXURE-2: Details of Solution quoted by bidder (To be filled by bidder)**

All required IT hardware (Server, Networking equipments and storage used in Datacenter) with operating system shall be provided by RISL as per the solution proposed by the successful bidder. However, All other system software are to be supplied by successful bidder.

S.No	Name of Application Software	Web Server Requirement			Application Server Requirement				Database Server Requirement			
		Web Server Requirement	Server Qty.	OS Requirement	Application Server Requirement	Name of App. Server Software	Server Qty.	OS Requirement	Database Server Requirement	Name of Database Software	Server Qty.	OS Requirement
1	AI based Video Analytics Software	RAM: CORE: PROCESSOR:			RAM: CORE: PROCESSOR:				RAM: CORE: PROCESSOR:			
2	Any other											

**ANNEXURE-3: BIDDER'S AUTHORIZATION CERTIFICATE {to be filled by the bidder}**

To,

{Procuring entity},

\_\_\_\_\_  
\_\_\_\_\_

I/ We {Name/ Designation} hereby declare/ certify that {Name/ Designation} is hereby authorized to sign relevant documents on behalf of the company/ firm in dealing with NIB reference No. \_\_\_\_\_ dated \_\_\_\_\_. He/ She is also authorized to attend meetings & submit technical & commercial information/ clarifications as may be required by you in the course of processing the Bid. For the purpose of validation, his/ her verified signatures are as under.

Thanking you,

Name of the Bidder: -

Verified Signature:

Authorised Signatory: -

Seal of the Organization: -

Date: \_\_\_\_\_

Place: \_\_\_\_\_

**ANNEXURE-4: Format for Submission of Project References in AI Based Video Analytics**

Project Name:	Value of Contract/Work Order (In INR):
Country: Location within country:	Project Duration:
Name of Customer:	Total No. of staff-months of the assignment:
Contact person with address, phone, fax and e-mail:	Approx. value of the services provided by your company under the contract (in INR):
Start date (month/year): Completion date (month/year):	
Name of associated Bidders, if any:	
Narrative description of Project:	
List of Services provided by your firm/company	

Please attach a copy of the work order/ completion certificate/ purchase order/ letter from the customer for each project reference

**ANNEXURE-5: Bidder's Details**

1.	<b>Name of Bidder</b>															
2.	<b>Name of Contact Person</b>															
3.	<b>Registered Office Address</b>															
4.	<b>Address of the bidder from which bid is submitted</b>															
5.	<b>Year of Establishment</b>															
6.	<b>Type of Firm</b>	<b>Public Limited</b>	<b>Private Limited</b>	<b>Others</b>												
	Put Tick( ✓ ) mark															
7.	<b>Telephone Number(s)</b>															
8.	<b>Email Address/ Website</b>	Email:	Web-Site:													
9.	<b>Fax No.</b>															
10.	<b>Mobile/ Pager Number</b>	Mobile:	Pager:													
11.	<b>GST No.</b>															
12.	<b>PAN NO:</b>															
13.	<b>Bidder Certification</b>	<table border="1"> <thead> <tr> <th><b>Bidder Certifications</b></th> <th><b>(Yes/No)</b></th> <th><b>Reference</b></th> </tr> </thead> <tbody> <tr> <td>CMMi Level 3</td> <td></td> <td>If Yes, Attachment at Page No. __</td> </tr> <tr> <td>CMMi Level 5</td> <td></td> <td>If Yes, Attachment at Page No. __</td> </tr> <tr> <td>ISO 9001</td> <td></td> <td>If Yes, Attachment at Page No. __</td> </tr> </tbody> </table>			<b>Bidder Certifications</b>	<b>(Yes/No)</b>	<b>Reference</b>	CMMi Level 3		If Yes, Attachment at Page No. __	CMMi Level 5		If Yes, Attachment at Page No. __	ISO 9001		If Yes, Attachment at Page No. __
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