Standard Operating Procedure (SOP)

Procurement and Installation of Weighbridge Automation Device by Vehicle Owners from Suggested Vendors/Integrators

1. Objective

The purpose of this SOP is to provide a clear process for Weighbridge Owners to buy and install approved automation devices only through Suggested Vendors/Integrators, as per the Department of Rajasthan Mines guidelines. This ensures transparency, compliance with rules, accurate weighing, real-time data sharing, and better monitoring of mineral transportation.

2. Scope

- All Weighbridge Owners must purchase and install automation devices only through Suggested Vendors/Integrators as per this SOP.
- Only Suggested Vendors/Integrators, authorized by the Department of Rajasthan Mines, are allowed to supply, install, and commission the weighbridge automation devices.
- Any new installation, retrofit, or upgrade of weighbridges must be approved and verified by the Department of Rajasthan Mines before commissioning.

3. Roles and Responsibilities

Stakeholder	Responsibilities
Weighbridge Owner	Select vendor/integrator, make payment, verify and handover Weighbridge for installation, ensure compliance.
Suggested Vendor/integrator	Supply certified device, install, configure, and integrate with the Govt. Regulatory system.
Rajasthan Mines	Publish vendor/integrator list, verify compliance post-installation, Support to integrate with Govt. Regulatory Application.

4. Process Workflow

Steps	Activities
Step-1	Access Suggested Vendor/integrator List *Weighbridge owner visits the Rajasthan-Mines portal and downloads/view list.*
Step-2	Vendor/integrator Selection and Order Placement *Contact chosen vendor/integrator, confirm order, and make payment.*
Step-3	Device Allocation and Appointment Scheduling *Vendor/integrator assigns device serial number and installation slot*
Step-4	Installation and Configuration *Install, configure and integrate with the controller.*
Step-5	Data Integration and Compliance Update *Vendor/integrator updates details in Raj-Mines' Weighbridge automation portal. Authority verify and generates Installation Certificate.*
Step-6	Testing & Integrate with Government Portal *Authority engaged SI for testing the configuration and integrate. Then on successful testing, the same will be integrate with the Government Portal.*
Step-7	Completion and Documentation *Weighbridge owner receives installation certificate, warranty, user manual.*

5. Service Level Agreement (SLA)

- Device Installation Time : Within 30 working days of order confirmation.
- Device Replacement : Within 48 hours in case of failure under warranty.
- Technical Support : 24x7 helpline for connectivity and functional issues.

6. Compliance and Penalty

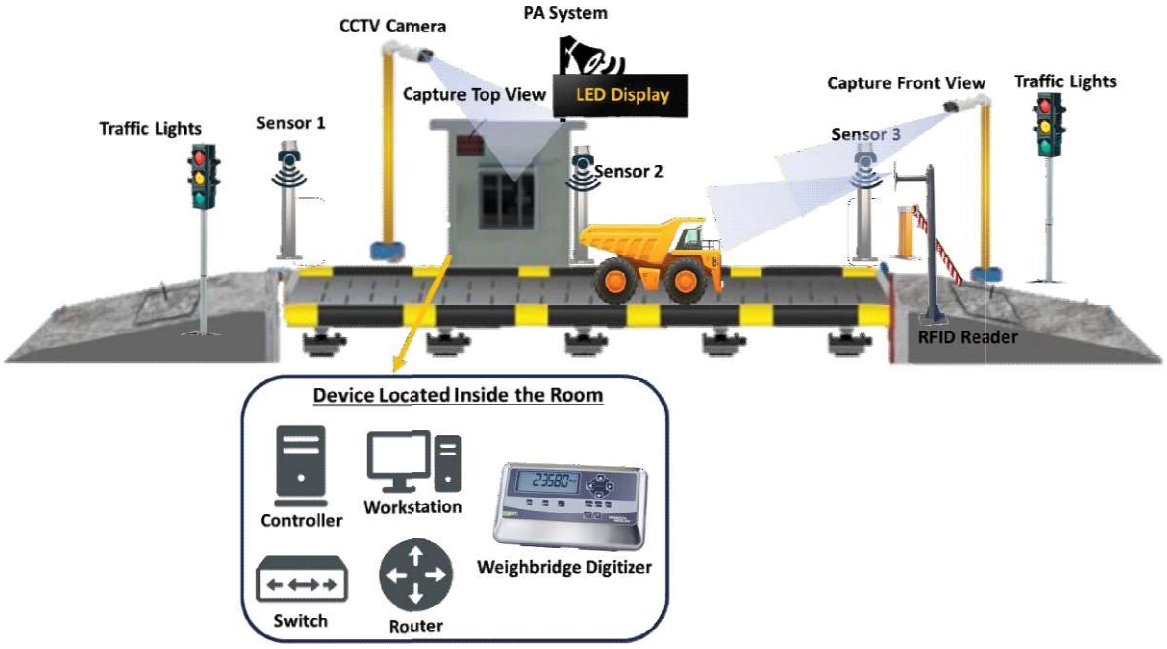
- Non-installation within stipulated time may attract penalty as per Rajasthan-Mines.

- Vendor/integrator must maintain device uptime ≥ 99% and ensure data integration with the Govt. Regulatory System.
- Failure to comply may result in vendor/integrator delisting.

7. Activities to be performed by Suggested Vendor/integrator

- Supply Department-approved devices and all accessories (RFID reader, cameras, boom barriers, sensors, LED display, sensors, cabling, UPS, poles, camera, Audio system, controller etc.).
- Install and mount equipment as per approved drawings ensure power, earthing and weatherproofing.
- Configure and integrate devices with the Government Regulatory application (e-Rawanna) and Weighbridge-Automation System.
- Perform on-site testing & UAT provide test reports and obtain client sign-off.
- Provide operation manuals, training, and an asset register with serial numbers and warranty details.
- Offer 12-month warranty support and post-warranty AMC options with defined SLAs respond promptly to faults and re-inspections.

7.1. Positions for device installation at the Weighbridge

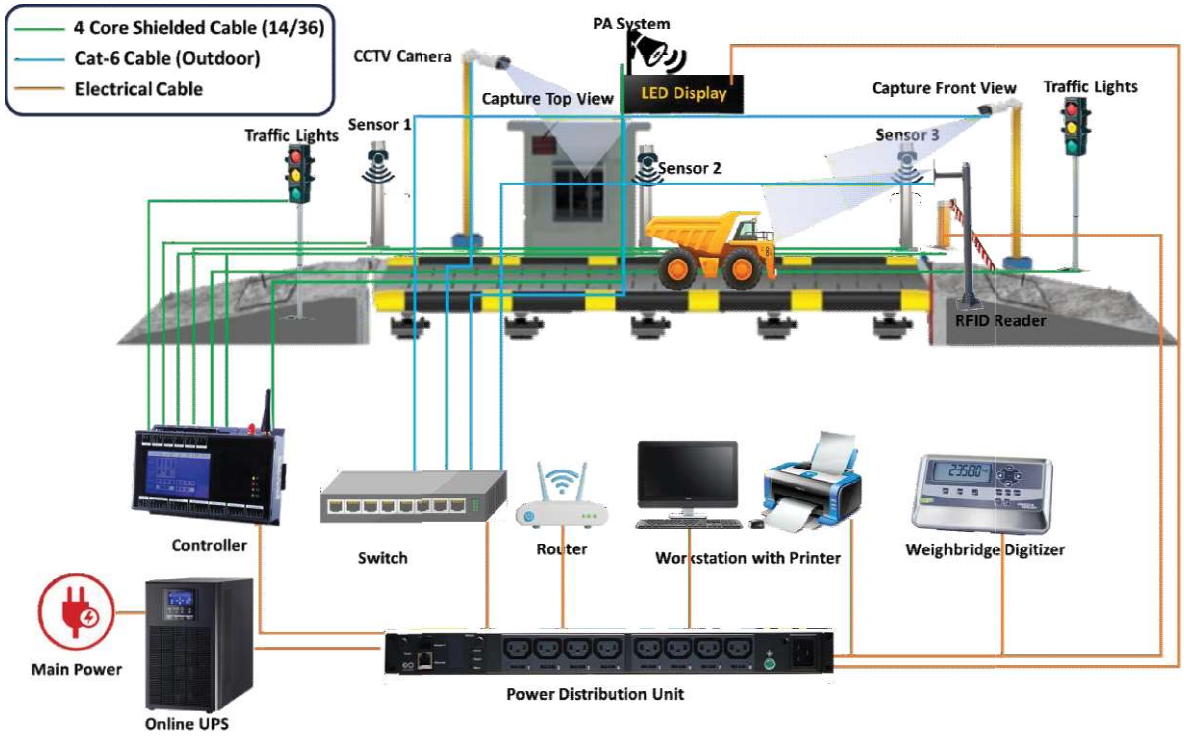


Sl#	Device	Position	Details / Function
1	RFID Readers	Installed at exit position of WB near boom barriers.	Installation will be done at Weighbridge to read the RFID Tag/FasTag pasted on vehicle mirror.
2	Boom Barriers with Safety Sensor	Installed at exit ramps of the WB.	Installation will be done at exit of the weighbridge to allow the vehicle to exit.
3	Traffic Lights	Positioned at entry and exit ramps of the WB.	Installation will be done Entry & Exit of the Weighbridge to guide the driver.
4	IP Bullet Camera	Mounted on poles at Middle of WB and exit of the ramp.	Installation will be done at Weighbridge to capture top & Front Photo during the weighment.
5	LED Display Board	Above or beside operator cabin	Installation will be done at Weighbridge to display various messages/instruction during weighment.

6	Vehicle Position Sensors	At entry, Middle and exit, of the WB platform	Ensure trucks are properly positioned before recording weight, and capture data of the entry and exit of vehicle position on WB Platform.
Sl#	**Device**	**Position**	**Details / Function**
7	Weighing Indicator	Inside operator cabin, connected to load cells	Shows weight and connected with the E-Rawana Desktop.
8	Controller	Inside operator cabin, connected to network device and other passive devices	Installation will be done at Weighbridge to Manage Weighbridge Hardware and Integrate with Application.
9	Networking & Server System	Inside operator cabin (rack-mounted)	Switches, router, Controller and server for connecting weighbridge devices to the central system.

**The position of device may change subject to site feasibility*

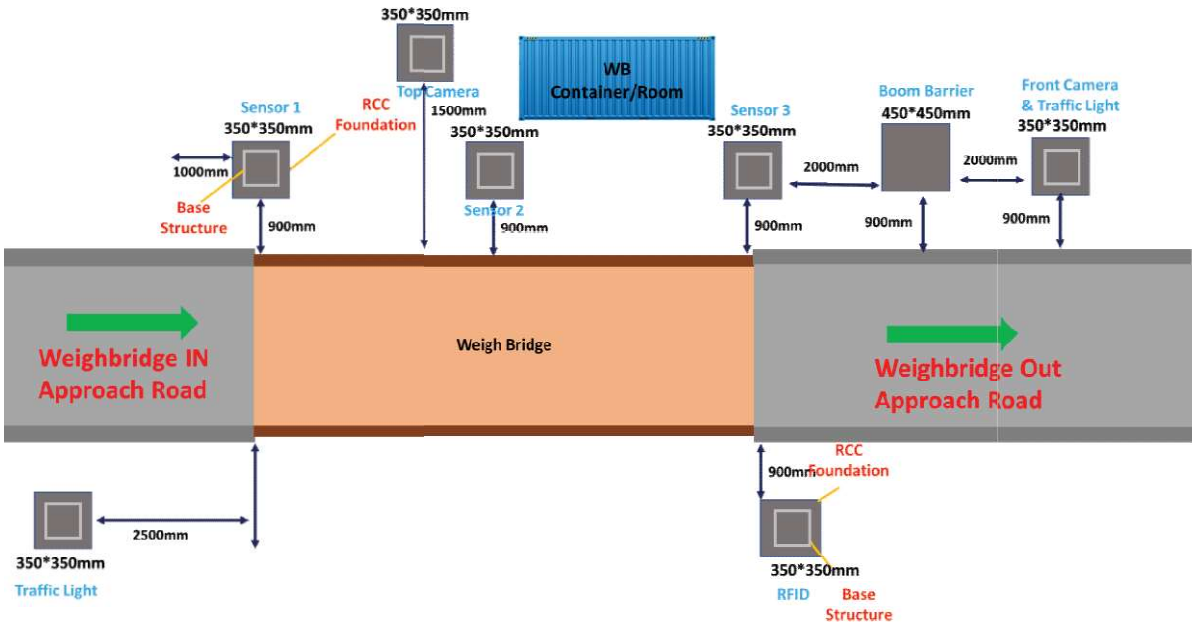
7.2. Wiring & Cabling Architecture of Weighbridges



7.3. Hardware communication Layer/protocol

Device	Input & Sensing Layer	Weighbridge Control Layer	Communication & Networking Layer	Processing & Operation Layer	Power & Backup Layer
RFID Reader	MQTT/Socket				
Sensors	Digital I/O				
Traffic Lights	Digital I/O				
Boom Barrier	Digital I/O				
Digital Weight Indicator		RS232			
LED Display		MQTT/API			
IP Bullet Camera			Ethernet & RTSP		
Switch			Ethernet		
Router/Wi-Fi Device			TCP/IP		
Weighbridge Controller				API/Socket/MQTT	
Computer (Workstation)				API	
Printer				USB	
UPS					

7.4. Civil Construction at Weighbridges

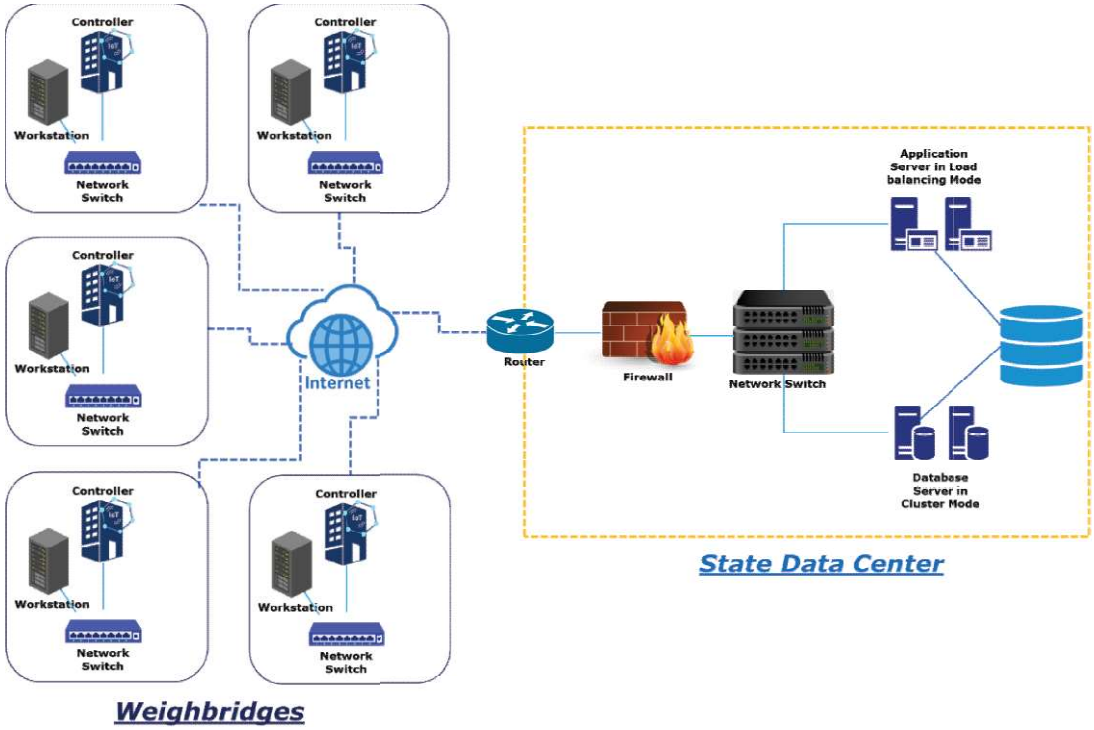


**The above is the standard layout of the civil structure. It may change subject to site feasibility*

Base Structure Guidelines for Equipment Installation:

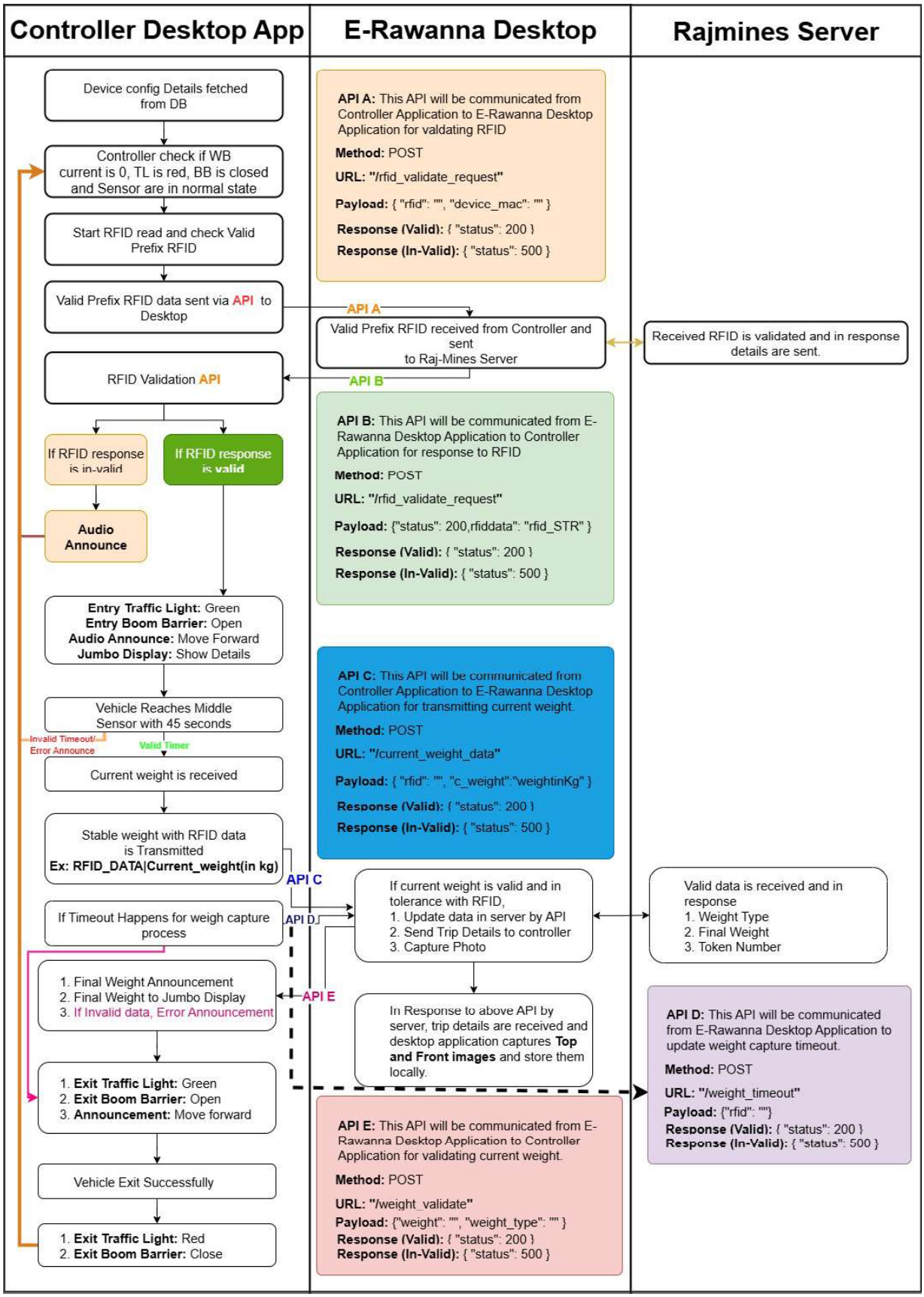
- All sensors should be installed on a base structure aligned with the same height as the weighbridge base level.
- The base structures for Traffic Lights, Cameras, and RFID Readers must be installed at a height greater than 1 ft above the weighbridge plate.
- The Boom Barrier base structure must be installed at a height greater than 2 ft above the weighbridge plate.

7.5. Network Architecture



- The desktop application (e-challan) will directly communicate to e-Rawana application (in SDC) through internet. (Protocol to be used 443)
- The controller connected with all the installed devices will be communicate with desktop application through local LAN (Port to be used 80)

7.6. Controller Configuration & Process Flow



7.7. Integration

The Suggested vender shall integrate below components.

a) **Hardware:** The various hardware components which the system shall be integrated with shall include: (CCTV camera, Boom Barrier, Traffic Lights, Controller & sensors, Public Announcement (PA) Systems, RFID Reader, LED Display, Weighbridge digitizer, ANPR Solution)

b) Govt. Regulatory System – e-Rawanna & Weighbridge Automation Software

The Suggested vender will integrate all the installed devices with Weighbridge Automation Software and e-Rawanna system. The integration activities must be done considering the functionalities mentioned above.

7.8. Bill of material Details for per Weighbridge with the hardware activity details

a) Device required for Automation

Sl#	Item	Unit	Qty	Purpose
1	RFID Reader	Nos	1	Installation will be done at Weighbridge to read the RFID Tag/FastTag pasted on vehicle mirror.
2	Position Sensors	Nos	3	Installation will be done at the weighbridge to detect and accurately position the vehicle during entry and weighment.
3	LED Display	Nos	1	Installation will be done at Weighbridge to display various messages/instruction during weighment.
4	PA System	Nos	1	Installation will be done at Weighbridge for Voice based announcement System to guide the driver.
5	IP Bullet Camera – Type1 (Top View)	Nos	1	Installation will be done at Weighbridge to capture Top view Photo during the weighment.
6	IP Bullet Camera – Type2 (Front View)	Nos	1	Installation will be done at Weighbridge to capture Front view Photo during the weighment also used for Name plate reading.
7	Traffic Lights	Pair	2	Installation will be done Entry & Exit of the Weighbridge to guide the driver.
8	Boom Barrier with Safety Sensor	Nos	1	Installation will be done at exit of the weighbridge to allow the vehicle to exit.
9	Controller	Nos	1	Installation will be done at Weighbridge to Manage Weighbridge Hardware and Integrate with Application.
10	Pole, Installation, Wiring & Cabling	Lot	1	Supplies & Cabling all necessary power and data connectivity to installed equipment.
11	Workstation	Nos	1	Installation will be done at Weighbridge for installation of WB Automation desktop app. This will be used to manage the I/O device and Controller.

b) Other IT devices required at WB

Sl#	Item	Unit	Qty	Purpose
1	PoE Network Switch & Network accessories	Nos	1	Installation will be done at Weighbridge to provides network connectivity.
2	Electricity Supply & Power backup provision	Lot	1	Provision of continuous electricity at the weighbridge location.
3	Desktop with Monitor	set	1	Desktop computer system with monitor for e-Rawanna Desktop application access.
4	Internet Connectivity	Lot	1	Dedicated 10 Mbps Internet Leased Line (ILL) connection with a) Public Static IP
				b) NAT and Port Forwarding support through Service Provider-supported router.
5	Printer	No	1	For printing the e-Rawana

8. Hardware Specifications

Refer Annexure-5

9. Documentation Checklist

- Proof of Payment.
- Compliance Certificate for the device with MAF.
- Delivery challan
- Testing & UAT Certificate
- Installation Certificate issued by the vendor/integrator.
- Training
- Preventive Maintenance report

10. Annexure

Annexure 1: Installation Checklist
Annexure 2: Payment Receipt
Annexure 3: Installation Certificate
Annexure 4: AMC and Support Details
Annexure 5: Device Technical Specifications

Annexure 1
Installation Checklist

Weighbridge Owner Name	
Weighbridge Registration Number	
Location Name	
Date of Installation	
Mount RFID readers with correct angle & sealing	
Mount top & front cameras test focus & IR	
Install LED display & verify as per solution	
Install boom barrier and verify as per solution	
Install position sensors & validate the Weighbridge Logic	
Testing the network connectivity to SDC/Cloud	
Apply surge protection & earthing	
Integrate the WB Automation solution with Govt-Regulatory as per the requirement	
Take post-installation photos & update drawings	

Annexure 2
Payment Receipt

Receipt No : _____

Date : _____

Received from : _____

Amount Paid : ₹ _____

Mode of Payment : _____

For weighbridge No : _____

Vendor/integrator Name & Signature : _____

Annexure 3
Installation Certificate

Certificate No.: _____
Project: Procurement & Installation of Weighbridge Automation Device
Weighbridge Location / Site: _____
Vendor/integrator (Suggested): _____
Vehicle Owner / Client: _____
Rajasthan Mines Inspector (if present): _____
Installation Date: ____/ ____/ _____
Commissioning Date: ____/ ____/ _____

Equipment Details

Delivery Item	Make / Model	Quantity	Serial / Asset No.
_____	_____	__	_____
_____	_____	__	_____
_____	_____	__	_____
_____	_____	__	_____
_____	_____	__	_____
_____	_____	__	_____
_____	_____	__	_____

Tests & Verification

- **UAT (User Acceptance Test):**

  ☐ Passed ☐ Passed with Observations ☐ Failed
  UAT Remarks: _____

- **Integration with Government Regulatory System (e.g., e-Rawanna):**

  ☐ Successful ☐ Pending ☐ Failed
  Integration Test Timestamp / Record ID: _____

- **Documentation Handover (Physical & Soft copies):** ☐ Yes ☐ No
  (Documents: Delivery challan, invoices, type-approval, manuals, warranty)

Training & Support

- **Operator / Admin Training Conducted:** ☐ Yes ☐ No
  Date: ____/ ____/ _____— *Attendees:* _____
- **Warranty Period Provided:** From ____/ ____/ _____to ____/ ____/ _____
- **AMC Offered:** ☐ Yes ☐ No — *Details / SLA Summary:* _____

Signatures (Handover & Acceptance)

Vendor/integrator Representative

Name: _____

Designation: _____

Company: _____

Signature: _____Date: ____/ ____/ _____

Weighbridge Owner Representative

Name: _____

Designation: _____

Location: _____

Signature: _____Date: ____/ ____/ _____

Rajasthan Mines Inspector (if present)

Name: _____

Designation: _____

Signature: _____Date: ____/ ____/ _____

Annexure 4
AMC & Support Details

Vendor/integrator shall provide the following AMC and support services:

1) AMC Duration: _____years (From _____To _____)

2) Support Availability: 24x7 / Business Hours

3) Response Time: _____hours

4) Contact Details for Support:

   Phone: _____

   Email: _____

5) Escalation Matrix:

   Level 1: _____

   Level 2: _____

   Level 3: _____

Annexure 5
Technical Specifications

1. RFID Reader and Antenna

- **Frequency & Compliance**
  Operating Frequency: 865-867 MHz (as per WPC regulations in India)
  RF Protocol: EPC global Gen2 (ISO 18000-6C)
  Antenna Type: Inbuilt or additional
  RF Power Output: Adjustable (up to 1W or 30 dBm, as per WPC limits)
- **Read Performance**
  Read Range: 3 to 12 meters
  Reading Speed: Up to 200 tags per second
  Tag Type: Passive UHF RFID tags (Gen2 UHF)
  Multi-tag Reading: Supports anti-collision for multiple tag reading
- **Connectivity & Interfaces**
  Communication: RS-232, RS-485 (optional), Ethernet
  GPIO Ports (optional): Configurable I/O for external devices like boom barriers, sensors, and alarms
  Power Supply: 9V to 24V DC input
- **Environmental & Mechanical Features**
  Operating Temperature: -20°C to +60°C
  Protection Rating: IP65 or higher (for outdoor use)
  Mounting: Pole-mount or wall-mount options
  Housing Material: Rugged, weatherproof enclosure

2. Position Sensors

Sl#	Parameter	Technical Specifications	Compliance (Yes/No)
1	Type	Ultrasonic Sensor	
2	Sensing range	200-4000 mm or better	
3	Adjustment range	240-4000 mm or better	
4	Transducer Frequency	Approx. 85 kHz or better	
5	Opening Voltage	10-20 V DC, ripple 10%ss	
6	No-load supply current	<50 mA	
7	Interface type	RS 232, 9600 Bit/s, no parity, 8 data bits, 1 stop bit	
8	Degree of protection	IP 65	
9	Output type	2 switch outputs PNP, NO/NC, programmable	

3. LED Display

Sl#	Parameter	Technical Specifications	Compliance (Yes/No)
1	Type	LED, Red Color	
2	LED Intensity	5500mCD or higher	
3	Visibility Range	Greater than 20 Meter	
4	Refresh Rate	50Hz-100Hz	
5	Display Support	true type fonts and adjustable based on the Operating system requirement	
6	Size	36” X 12” or above	
7	Communication	Ethernet	
8	Protocol Supported	MQTT or better	
9	Power	12 VDC	
10	Language	English & Numeric	
11	Rating	IP 56 or better	

4. Public Announcement System

Sl#	Parameter	Technical Specifications	Compliance (Yes/No)
	Amplifier		
1	Power Output	37W Max., 30W RMS at 10% THD, 27W RMS at 5% THD	
2	Output Regulation	≤ 2 dB, no load to full load at 1kHz	
3	Input Channels	2 × Mic. 0.5mV/2.5kΩ, 1 × Aux 50mV/330kΩ	
4	Speaker Outputs	4Ω, 8Ω, 16Ω & 100V	
	Speaker		
1	Input Power	30W RMS/45W Max.	
2	Frequency Response	240-10,000Hz	

5. IP Bullet Camera – Type-1

Sl#	Parameter	Technical Specifications	Compliance (Yes/No)
1	Image sensor	1/2.8" Progressive scan CMOS sensor	
2	Resolution	Minimum 2 Mega Pixel; 1920X1080 @ 25/30 FPS or better	
3	Lens	Focal Length: Motorized varifocal (2.8-12) mm	
4	IR Range	IR 30-meter or higher	
5	Communication Interface	Ethernet RJ45 10M/100M	
6	Power requirement	PoE+/ 12VDC	
7	Environmental Protection	IP66 or above	
8	Network protocols	IPv4, IPv6, HTTP, HTTPS, NTP, RTSP, SRTP/RTSPS, TCP, UDP, MQTT(Optional)	

6. IP Bullet Camera – Type-2

Sl#	Parameter	Technical Specifications	Compliance (Yes/No)
1	Image sensor	1/1.8” progressive scan RGB CMOS or Better	
2	Day and night	Automatically removable infrared-cut filter	
3	Shutter speed	1/25 s–1/100000s (manual/auto) or Better	
4	Max speed for detect	80km/h	
	Lens	Varifocal f10 mm – 50 mm	
5	Video compression	H.265, H.264M, H.264H, and MJPEG.	
6	Resolution	5 Megapixel (2560 X 1920) or better	
7	Frame rate	30fps (1920 X 1080)	
8	Network protocols	IPv4, IPv6, HTTP, HTTPS, NTP, RTSP, SRTP/RTSPS, TCP, UDP, MQTT(Optional)	
9	Application Programming Interface	Open API for software integration. ONVIF Profile G, ONVIF Profile S, and ONVIF Profile T compliant.	
10	Network security	IEEE 802.1X (EAP-TLS), IEEE 802.1AR, HTTPS/HSTS, TLS v1.2/v1.3, Network Time Security (NTS), X.509 Certificate PKI, IP address filtering	
11	Casing	IP66/IP67	
12	Power	Power over Ethernet (PoE) IEEE 802.3af/802.3at	
13	Connectors	RJ45 10BASE-T/100BASE-TX PoE	
14	IR illumination	IR with power-efficient, long-life 855 nm IR LEDs Range of reach 20 m (65.6 ft) or more depending on the scene	
15	Operating conditions	−20°C to +65°C or Better	
16	Certifications	CE, FCC, UL	

7. Traffic Light in Pair (Red & Green)

Sl#	Parameter	Technical Specifications	Compliance (Yes/No)
1	Description-Two colour (Red and Green)	Stop/Go -Red and Green Traffic Light	
2	LED LIFE	1,00,000 HRS	
3	Type	SMD 3528 or Better	
4	Housing	200MM/300MM-Standard	
5	LED	High bright	
6	Input Voltage	12V DC	

8. Boom Barrier with Safety Sensor

Sl#	Parameter	Technical Specifications	Compliance (Yes/No)
1	Type	Outdoor	
2	Ingress Protection	IP 54 or Higher	
3	Interfaces	Wired (Open, Close, COM)	
4	Max. Boom Pole Length	3 Mtr. Barrier	
5	Opening & Closing Time	<=5.0 seconds	
6	Safety Sensor	As per requirement	

9. Controller

Sl#	Parameter	Technical Specifications	Compliance (Yes/No)
8-Channel I/O Controller			
1	Input / Output Channels	• 8-channel isolated digital input/output module • Communication: RS485(MODBUS RTU) • Baud rate: 4800–115200 bps configurable • Power: 6-36V DC • LED indicators per I/O channel • DIN rail mountable • Operating temp: -20°C to +70°C • ESD & surge protection on RS485 port	
12V 4-Channel Relay Module			
2	Relay Module	• 4-channel relay output board • Coil voltage: 12V DC • Contact rating: 10A @ 250V AC / 30V DC • Opto-isolated control • Status LED indicators • Compatible with Modbus I/O outputs • DIN rail mountable	
USB to RS485 Communication Converter			
3	USB to RS485 Communication Converter	• Interface: USB Type-A to RS485 • Baud rate: 4800–115200 bps • Isolation protection preferred • Plug-and-play • Compatible with Windows/Linux • LED indicators for TX/RX • DIN rail mountable	
4	USB Cable	• Twisted pair, shielded cable • Conductor size: 0.5 mm^2 or higher • PVC insulated, industrial grade • Length as per site requirement	
12V DC SMPS Power Supply			
5	Power Supply (Module)	• Input: 100–240V AC, 50/60Hz • Output: 12V DC, 10A (min) • Overload, overvoltage, short-circuit protection • Efficiency ≥80% • Enclosed, industrial-grade • CE/ISO certified • DIN rail mountable(optional) •	

Enclosure			
Sl#	**Parameter**	**Technical Specifications**	**Compliance (Yes/No)**
6	Enclosure	Type: Wall-mounted / Pole-mounted / Outdoor Application: Housing of above mentioned items Standard Compliance: IEC 60529 (IP Rating) or similar Protection Class: IP 65 & Outdoor support Doors: Hinged front door with concealed hinges and gasket sealing Cable Entry: Bottom or top gland plate, detachable, 2.0 mm thickness Body Material: Cold Rolled Close Annealed (CRCA) Sheet Steel, 2.0 mm for body Ventilation: Louvers with dust filters / optional cooling fan for heat dissipation Electrical & Earthing: Provision must be there Mounting and Accessories: Wall mounting brackets / Floor stand (with base frame) Relative Humidity: up to 95% non-condensing Installation Location: Indoor / Outdoor / Coastal / Industrial area	

10. Pole & Accessories

Sl#	Parameter	Technical Specifications	Compliance (Yes/No)
1	Pole Details	Pole shall be hot dip galvanize	
2	Civil Construction details	The pole shall be installed on a precast or cast in- SITU RCC foundation on studs with nuts & washers and with a set of four foundation bolt for greater rigidity basis the soil bearing capacity of the actual site.	
3	Size	As per the project requirements	

11. Workstation

Sl#	Parameter	Technical Specifications	Compliance (Yes/No)
1	Architecture	Intel	
2	Form Factor	Tower	
3	Processor	1x 16 Core Intel Xeon Processor	
4	Memory	32 GB DIMM Memory, support up to 128GB	
5	Expansion Slots	Up to 4 x PCIe 3.0	
6	HDD	2 X 1 TB SSD HDD;	
7	HBA/RAID Support	Software RAID	
8	Network Interface	2x 1GbE ports std; optional 1GbE, 10GBASE-T, and 10Gb SFP+; 1x dedicated 1GbE management port	
9	Operating System	Windows server 2019 or higher	
	Monitor		
1	Size	21 inch Full HD LED Monitor	
2	Connectivity	1VGA Port,1 HDMI Port	

12. PoE Network Switch

Sl#	Parameter	Technical Specifications	Compliance (Yes/No)
1	Port Density	24-port 10/100/1000TX switch	
2	PoE	PoE ports with Minimum 190W total power budget	
3	VLAN	Support VLAN feature	
4	L2 Protocol	Support L2 Protocol	
5	Management Interface	CLI/GUI	

13. Desktop with Monitor

Sl#	Parameter	Technical Specifications	Compliance (Yes/No)
1	Processor	Core i5 Processor or higher	
2	Memory	16GB memory or higher	
3	Storage	Min. 500 GB SSD or Higher	
4	Ethernet	1000Mbps	
5	OS	Windows	
6	Display	18" Monitor or higher	

14. Internet Connectivity

Dedicated 10 Mbps Internet Leased Line (ILL) connection with

a) Public Static IP

b) NAT and Port Forwarding support through Service Provider-supported router

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Standard Operating Procedure (SOP)

Procurement and Installation of GPS based VTS Device by Vehicle Owners from Suggested Vendors/Integrators

a) Objective

This SOP defines the process for vehicle owners to procure and install AIS-140 compliant Vehicle Tracking System (VTS) devices from Suggested Vendors/Integrators to ensure compliance with Department of Rajasthan Mines guidelines.

b) Scope

Applicable to:

- Vehicle Owners / Fleet Operators mandated to install VTS devices.
- Suggested Vendors/Integrators by Rajasthan Mines.
- Installation Centers approved by Vendors/Integrators and verified by Rajasthan Mines.

c) Roles and Responsibilities

Stakeholder	Responsibilities
Vehicle Owner	Select vendor/integrator, make payment, present vehicle for installation, ensure compliance.
Suggested Vendor/integrator	Supply certified device, install, configure, and integrate with the monitoring system.
Rajasthan Mines	Publish vendor/integrator list, verify compliance post-installation, maintain central VTS database.

d) Process Workflow

Steps	Activities
Step-1	Access Suggested Vendor/integrator List *Vehicle owner visits the Rajasthan-Mines portal and downloads/view list.*
Step-2	Vendor/integrator Selection and Order Placement *Contact chosen vendor/integrator, confirm order, and make payment.*
Step-3	Device Allocation and Appointment Scheduling *Vendor/integrator assigns device serial number and installation slot*
Step-4	Installation and Configuration *Install device, configure SIM and platform integration.*
Step-5	Data Integration and Compliance Update *Vendor/integrator updates details in Raj-Mines' VTS portal and generates Installation Certificate.*
Step-6	Completion and Documentation *Vehicle owner receives installation certificate, warranty, user manual.*

e) Service Level Agreement (SLA)

- Device Installation Time : Within 3 working days of order confirmation.
- Device Replacement : Within 48 hours in case of failure under warranty.
- Technical Support : 24x7 helpline for connectivity and functional issues.

f) Compliance and Penalty

- Non-installation within stipulated time may attract penalty as per Rajasthan-Mines.
- Vendor/integrator must maintain device uptime ≥ 99% and ensure data transmission to the central system.
- Failure to comply may result in vendor/integrator delisting.

g) Documentation Checklist

- Proof of Payment.
- AIS-140 Compliance Certificate for the device.
- Installation Certificate issued by the vendor/integrator.
- Owner's KYC (if required by regulation).

h) Annexure

Annexure 1: Installation Checklist
Annexure 2: Payment Receipt Template
Annexure 3: Installation Certificate Template
Annexure 4: VTS Device Technical Specifications
Annexure 5: AMC and Support Details

Annexure 1
Installation Checklist

Vehicle Owner Name	
Vehicle Registration Number	
Device IMEI Number	
Date of Installation	
GPS Signal Tested (Yes/No)	
SIM Activated (Yes/No)	

Annexure 2
Payment Receipt

Receipt No : _____

Date : _____

Received from : _____

Amount Paid : ₹ _____

Mode of Payment : _____

For VTS Device IMEI No : _____

Vendor/integrator Name & Signature : _____

Annexure 2
Installation Certificate

This is to certify that the VTS Device with the following details has been successfully installed:

Vehicle Registration Number : _____

Device IMEI Number : _____

Date of Installation : _____

Installed By : _____

Vendor/integrator Authorized Signatory : _____

Seal & Stamp

Annexure 4
AIS 140 GPS based VTS Device Technical Specifications

1) **Device Specifications**
   a) **GNSS (GPS) Module**
      Satellite Support: GPS, GLONASS/BDS, Galileo, and IRNSS (NavIC recommended) for Real Time Tracking
      Position Accuracy: ≤ 2.5 meters CEP
      Cold Start: ≤ 35 seconds
      Hot Start: ≤ 1 second
      Antenna: Internal or External GNSS Antenna
   b) **GSM / LTE Connectivity**
      Network Support: 2G/3G/4G LTE (as per DoT/WPC requirements)
      GSM Bands: 850/900/1800/1900 MHz
      SIM Type: eSIM / Nano SIM / Micro SIM
      GPRS Class: Class 12 or higher
      Data Transmission: TCP/IP, SMS fallback
   c) **Processor & Memory**
      Processor: ARM Cortex / Equivalent high-performance MCU
      RAM: Minimum 512 KB
      Flash Memory: Minimum 4 MB (for logs & event storage) Minimum 40000 Location Record or 4 hours of data when GSM/GPRS is unavailable. Auto-upload on network restoration.
   d) **Digital / Analog Inputs & Communication Interface**
      Minimum 4 Digital Inputs (e.g. ignition, door, panic button), 2 Digital Outputs, and 2 Analog Inputs.
      RS232 / RS485 / USB interface for configuration and integration.
   e) **Power Supply**
      Operating Voltage: 9V – 36V DC
      Power Consumption: < 2W (normal operation)
      Backup Battery: Minimum 4-hour operation during power failure
      Protections: Reverse polarity, overvoltage, and short circuit
      Operating Temperature: −20°C to +70°C
   f) **Enclosure & Indicators**
      Enclosure : Rugged enclosure with minimum IP65/IP66 protection (dust and water resistant). Tamper-proof design with sealable mounting and provision for secure installation inside the vehicle.
      Indicators : LED indicators for GPS, GSM, and Power status.

2) **Software & Functionality**
   a) **Data Logging & Storage**
      Min. Transmission Frequency: Position data update at least every 10 seconds during vehicle movement and 60 seconds when idle.
   b) **Security & Compliance**
      Data Encryption: TLS/SSL
      Authentication: Device IMEI-based authentication for secure communication
      Firmware Upgrade: OTA (Over-The-Air) updates supported
   c) **Geo-Fencing & Alerts**
      Geo-Fencing: Configurable multiple geofences
      Alert Types: Speeding, tampering, power disconnection, SOS, route deviation, SIM Removal or casing open events with corresponding alerts.

d) Server Communication & Software Integration

Support AIS 140 protocol for real-time data transmission

Device must be configurable to communicate with both Central Command & Control Server (Transport Department) and the Vendor/integrator's Application Server.

Packet Format: Compatible with standard APIs REST/JSON/XML format for integration or as final during implementation.

3) Certifications & Legal Compliance in India

- AIS 140 Certification: By ICAT / ARAI / BIS / Other Govt. Labs
  WPC Approval: For wireless communication (GSM/GPRS/LTE)
- IP Rating: IP65/IP66/IP67 for rugged, outdoor use
- Device shall comply with AIS 140 environmental and EMC/EMI standards.
- Warranty: Minimum 3 years onsite warranty including replacement in case of hardware failure.

4) Accessories & Installation

- Accessories: All required cables, mounting brackets, SIM slots, and panic buttons must be provided.
- Installation: Installation shall be carried out by authorized technicians ensuring compliance with transport department norms.

Annexure 5
AMC & Support Details

Vendor/integrator shall provide the following AMC and support services:

1) AMC Duration: _____years (From _____To _____)
2) Support Availability: 24x7 / Business Hours
3) Response Time: _____hours
4) Contact Details for Support:

   Phone: _____

   Email: _____

5) Escalation Matrix:

   Level 1: _____

   Level 2: _____

   Level 3: _____