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महानदी कोलफील्डस लिमिटेड
Mahanadi Coalfields Limited
(A subsidiary of Coal India Limited)

महाप्रबंधक का कार्यालय
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क्रमांक संख्या: एम.सी.एल/मुख्यालय/नवोन्मेष विभाग/2025-26/1191 दिनांक: 06/10/25

REQUEST FOR QUOTATION (RFQ)

A. Mahanadi Coalfields Limited (MCL), a subsidiary of Coal India Limited (CIL) seeks quotations (for budgetary estimation) of the following work as per the annexures attached:

DESCRIPTION OF WORK	LOCATION OF WORK EXECUTION
AI-Based Speed Monitoring System at MCL	Lakhanpur Area.

B. This RFQ is available on the official website of Mahanadi Coalfields Limited (www.mahanadicoal.in), on the e-Procurement portal of CIL (https://coalindiatenders.nic.in) and on the Central Public Procurement Portal (https://eprocure.gov.in).

C. Response to the RFQ must be sent vide email ONLY; to mcl.innovationcell@coalindia.in, on or before 27/10/2025. Please email any clarification in the address on or before 27/10/2025. Clarifications sought after this date shall not be entertained.

D. Interested entities may request a visit to the sites where this work has been envisaged. Please email requests for visit at mcl.innovationcell@coalindia.in so that response to RFQ is received on or before 27/10/2025. No extension of dates shall be entertained ONLY due to inability of interested entities being unable to visit the sites. All interested entities are encouraged to visit the sites for comprehensive understanding of the work.

E. Details of the RFQ are attached as Annexures – 01, 02, 03 and 04:

1. Annexure – 01: Scope of Work. [15 Pages]
2. Annexure – 02: Format of BOQ. [01 Page]
3. Annexure – 03: Payment Terms. [02 Pages]
4. Annexure – 04: List of Documents Envisaged. [07 Pages]

F. Please note that **this RFQ is NOT a tender,** it is only for estimation purposes. MCL reserves the right to float or NOT float a subsequent tender based on this RFQ; if so; after any modification as deemed fit in the accompanying annexures of this RFQ along with the response received. No reason for any subsequent action shall be provided.

S Jha 6/10/25
Dr. Shambhu Jha
GM(Min)/HOD, Innovation Cell, MCL

Contact Person for Clarification and Site Visit:
Shri. Y Kamaleshwar Singha,
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Distribution:
1. TS to CMD/ TS to D(T/OP)/ TS to D(T/P&P)/ TS to D(P)/ TS to D(F), MCL
2. All Notice Board and Digital Boards.

Annexure – 01: Scope of Work

RFQ Reference: क्रमांक संख्या: एम.सी.एल/मुख्यालय/नवोन्मेष विभाग/2025-26/1191 दिनांक: 06/10/25

About the document:

This document outlines the Scope of Work (SOW) for the design, supply, installation, testing, commissioning, and long-term maintenance of a comprehensive, an OPEX Speed Monitoring System for mine plying vehicle like tippers operating within the Lakhanpur Area of Mahanadi Coalfields Limited (MCL). This initiative is a critical component of MCL's commitment towards enhancing operational safety, enforcing traffic discipline among contractor-operated heavy vehicles, and automating the process of identifying and penalizing speed limit violations. Accordingly, the scope of work is detailed in 07 sections as follows:

A. System Overview and Operational Context.
B. On-Site Infrastructure and Hardware Specifications.
C. Central Software Platform: Dashboard and Analytics.
D. Mobile Application and Notification Services.
E. Enterprise Integration for Automated Financial Deduction.
F. System Administration and User Management.
G. Project Deliverables, Commissioning, and Support.

Please note that the framework of this document is indicative and the mode of work execution is OPEX i.e. pay-as-you-go model. However, although there is no bar in the choice of technology to be adopted, a very large deviation from this document is NOT envisaged and/or advisable lest it diverges from the end effect expected. Solution provider is expected to follow this document as a principle guide towards deployment of a suitable solution. In all cases, however, the solution provider shall bear full responsibility (with full liberty to choose all or none of the engineering systems – soft and hard; envisaged in this document) for successful delivery of the solution envisaged in this document as well as its associated documents like payment terms, BOQ, etc. or any other conditions set at the time of tender; in letter as well as spirit.

A. System Overview and Operational Context

1. **Introduction and Project Mandate:** The work aims to achieve the following:
   i. **Enhance Safety:** To significantly reduce the risk of accidents and incidents related to excessive vehicle speed within the mine's operational areas, thereby safeguarding personnel and assets.
   ii. **Automate Compliance:** To establish a transparent, objective, and automated system for monitoring speed compliance, removing manual intervention and potential for disputes in the penalty process.
   iii. **Improve Driver Behavior:** To foster a sustained culture of safe driving among all contractor personnel by creating a direct and immediate feedback loop between violations and financial consequences.

2. The scale of operations at MCL involves the integrated functioning of massive multi-contractual and departmental mine logistics plying circuitously across mine roads, which naturally necessitates a robust and scalable technological solution to manage the high volume of heavy vehicle traffic effectively. The successful implementation of this system is expected to not only improve safety and efficiency but also serve as a potential blueprint for enhancing safety standards across other mining operations. In this regard, deployment at Lakhanpur Area is undertaken as a pilot project.
3. For this pilot project, 25 locations are envisaged. The list of these locations shall be provided to the successful bidder (solution provider) ONLY. They are to be deployed for full functional demonstration of 05 locations first and later extended to remaining 20 locations.

4. Along with the system at place physically in these locations, a monitoring software system is envisaged along with its ecosystem to ensure a coherent speed monitoring system at Lakhanpur Area.

5. Description of the Operational Environment: The provided solution architecture against the requirement of this document must be engineered to operate with high reliability and accuracy within the uniquely challenging environment of a large-scale open-cast coal mine. Mines under Lakhanpur Area are characterized by continuous, 24/7 operations involving a large fleet of heavy vehicles, including tippers plying across the mines, managed by numerous external contractors. The road network within the mine is complex, featuring multiple traffic convergence points, haul roads, and crossroads where there is elevated hazard of collision.

6. In line with the above, the system's design and technology selection must comprehensively address the following environmental and operational challenges:

   i. Atmospheric Particulates: Open-cast mining activities, including drilling, blasting, excavation, and the movement of heavy machinery, generate an "alarmingly high" concentration of suspended particulate matter (fugitive dust). This dust can obscure optical sensors, coat equipment, and degrade the performance of sensitive electronics if not adequately protected.

   ii. Adverse Weather Conditions: The system must maintain full operational capability during adverse weather, including heavy monsoon rains, dense fog, and extreme summer heat, all of which are characteristic of the region. These conditions can severely impact the performance of visual and light-based sensor technologies.

   iii. Vibration and Shock: The constant movement of heavy dumpers and tippers, some with payloads exceeding 100 tonnes, generates significant ground vibration. All on-site equipment, particularly electronics and gantry structures, must be designed to withstand continuous, low-frequency vibrations.

   iv. Lighting Variability: The system must function flawlessly in all lighting conditions, from the harsh glare of direct midday sun, which can cause lens flare and overexposure, to the complete darkness of night operations, which requires high-performance artificial illumination.

   v. Industrial Environment: Equipment will be exposed to potential contamination from coal dust, grime, and water spray from dust suppression activities. All external components must be housed in appropriately rated enclosures to prevent ingress and corrosion. This also includes protection from lightning and other disruptive external factors detrimental to the safe operation of the deployed system.

   vi. Power Supply: While the power supply can be envisaged from mine supply system, there must be power back-up in-built in each deployment to withstand at least one complete shift of 8 hours after power supply is disrupted from ordinary supply.

   vii. Connectivity: The solution provider must ensure connectivity of the deployed system. Mode of connectivity is left to the solution provider; however, the end effect must be real-time data transmission.

7. High-Level System Architecture and Workflow: The proposed Speed Monitoring System shall be an end-to-end, integrated solution. The solution provider is responsible for delivering all hardware, software, and services necessary to achieve the functionality described herein. The system's architecture must follow a logical data flow from capture to final action, ensuring data integrity, security, and auditability at every stage.

8. A high-level functional diagram must be provided by the solution provider, illustrating the following core workflow:

   i. Stage 1: Data Capture (At the Gantry)
      a. A tipper approaches a gantry structure at one of the 25 designated monitoring locations.
      b. A gantry-mounted AI-enabled camera augmented by active sensors (like Doppler RADAR) measures the vehicle's speed with high accuracy.
      c. Simultaneously, a specialized ANPR camera captures high-resolution images of the vehicle's front or rear license plate for positive identification.
      d. Assessing type of vehicle shall be prerogative of MCL. System shall be enabled to detect speed

for all vehicles plying in the mines.

ii. Stage 2: Edge Processing (At the Gantry)
   a. An on-site industrial gateway receives the raw data from the sensor ecosystem.
   b. The gateway's processor runs algorithms to correlate the speed reading with the vehicle's identity.
   c. If the recorded speed exceeds the pre-configured limit for that location, the gateway packages the violation data (speed, vehicle ID, timestamp, location ID, etc.) and evidentiary images into a secure data packet. This local processing must ensure rapid event detection and reduce network load.

iii. Stage 3: Secure Transmission
   a. The edge gateway transmits the data packet to the central application server over a secure, encrypted wireless or wired network connection (to ensure high-speed transmission always). The system must be capable of buffering data locally in the event of a temporary network outage to prevent data loss. The provision of communication channels (network coverage) shall be the responsibility of the solution provider.

iv. Stage 4: Central Processing and Validation
   a. The central server receives and ingests the data packet.
   b. The software platform processes the violation, automatically cross-referencing the vehicle registration number with a master database to identify the associated contractor.
   c. The violation event, along with all evidentiary data, is presented in the web-based dashboard for review and validation by authorized MCL personnel.

v. Stage 5: Automated Reporting and Notification
   a. Upon validation, the system generates a formal, non-editable Speed Violation Report in a standardized format.
   b. Simultaneously, the system pushes real-time notifications to subscribed users (e.g., site supervisors, safety officers) via the dedicated mobile application and SMS.

vi. Stage 6: Financial Integration and Deduction (optional as per MCL's instruction).
   a. The validated violation triggers a secure, automated Application Programming Interface (API) call to MCL's SAP system.
   b. The API call transmits the necessary data for SAP to create a financial deduction entry against the specific contractor's account.
   c. The SAP system sends an acknowledgment response to the SPEED MONITORING SYSTEM, and the violation status is updated to "Deduction Processed," completing the automated workflow.

9. The above stages must take place in real-time with NO lag between sequential steps. The data must move from terminal to terminal in encrypted form ONLY accessible to authorized personnel of MCL.
10. The system must be able to ingest data from multiple sources without additional cost to MCL for building the protocol or the interface.
11. Similarly, the system must be able to share data to any other platform as decided by MCL without additional cost of bridging the data interface or the protocol.
12. Data must be encrypted with AES 256 encryption or higher and must be securely preserved locally ONLY, in a NAS, or in case of cloud the must be as designated by MCL ONLY.
13. Compliance of data security as well as system security must be ensured through an annual VAPT (or after every case of data security breach or major modification of the system) by CERT-In certified body. Breach of data security may lead to termination of work and banning. IT policy / Cyber-security policy of CIL must be complied.
14. Timeline: After the issue of work order, site-access permission (site handover) shall be given to the solution provider in 15 days. Within the next 180 days, the solution provider must install the sensor ecosystems in 05 locations first and develop the underlying software systems, network connectivity and all supporting systems. A system commissioning report (SCR) shall be issued by MCL. Thereafter, the solution provider shall then

install the commissioned version of the system in remaining 20 locations, after which an FSDR (Full System Deployment Report) shall be issued by MCL. All these activities (till issue of FSDR) are to be completed within 180 days. This shall conclude Phase – I of the work.

15. Once the FSDR is issued, the solution provider shall operate the system (at 25 locations) for a period of 1095 days. This operational period shall be Phase – II. Please refer to BOQ document for further details. So, total period of work shall be 1290 days after the issue of work order.
16. Payment shall be made on monthly-basis after issue of FSDR.
17. The system shall be capable of auto-generation of availability report at the end of each day/month; as required by the EIC – (Engineer-In-Charge).
18. Please see document of payment terms for more details and BOQ for timeline and other details.

B. On–Site Infrastructure and Hardware Specifications

1. Gantry ("Goal-Post") Structures: The solution provider shall be responsible for the complete design, fabrication, transportation, and erection of twenty-five (25) gantry structures at locations to be specified by MCL within the Lakhanpur Area. These structures must be portable and shiftable as desired by MCL throughout the period of operation after commissioning. Such shifting and operation must be concluded in 07 days from the SCR (Site Change Request) made by SIC. MCL may seek to change the locations of these structures once a year. In all totality; the cumulative shifting shall be 25 events per year; of either the same or different structures along with sensor eco-system and resulting impact on laying facilities for network connectivity, etc. without any additional cost to MCL.

2. Design and Fabrication: The structural design must be robust, catering specifically to the industrial mining environment. The design shall be able to withstand static load of the dead weight of all mounted equipment, and dynamic loads induced by the vibration of heavy vehicle traffic, wind and other geo-disturbances. The design shall be modular to facilitate transportation and on-site assembly with minimal disruption to mine operations. The gantry must provide sufficient clearance for the largest vehicles operating in the mine. The structural framework should be comparable to those used in permanent Highway Traffic Management Systems (HTMS), prioritizing longevity and stability.

3. Materials and Corrosion Protection: All structural components shall be fabricated from high-tensile structural steel. To ensure long-term durability in the corrosive mining atmosphere, all steel members must undergo some procedure of anti-corrosion treatment. All fasteners, bolts, nuts, and washers shall be of high-tensile steel and electro-galvanized or hot-dip galvanized. Overall integrity of steel structures and all mounted equipment shall be the responsibility of the solution provider (successful bidder).

4. Installation and Foundation: Prior to installation, the solution provider must apprise SIC and local team to coordinate with mine operations to ensure safety and minimize downtime of haul roads.

5. Features and Fittings: Each gantry structure must be equipped with the following:

i. Equipment Mounts: Secure, adjustable mounting brackets for all sensors, cameras, illuminators and display.
ii. Weatherproof Enclosures: At least one IP66-rated, lockable enclosure mounted on the gantry for housing the edge computing gateway, power supplies, and network equipment.
iii. Cabling Conduits: All power and data cables running along the gantry structure must be protected within rigid, conduits (concealed inside the steel pipes to prevent physical damage and environmental degradation.
iv. Safety and Maintenance Access: The design should incorporate provisions for safe maintenance access where feasible, such as ladder access points with safety cages, in compliance with industrial safety standards.

6. **Speed Detection System:** The primary method for vehicle speed measurement shall be a non-contact, all-weather system.

i. **Technology Mandate:** The system shall exclusively utilize industrial-grade Doppler radar sensors. This technology is mandated due to its superior performance and reliability in environments with high levels of dust, rain, fog, and snow, where optical-based systems such as LiDAR can experience significant performance degradation. The proposed radar shall be of the Frequency Modulated Continuous Wave (FMCW) type, which provides highly accurate, simultaneous measurement of an object's speed, distance, and direction of movement.

ii. **Performance Specifications:** The proposed Doppler radar sensor must meet or exceed the following performance criteria:

a. **Accuracy:** Speed measurement accuracy of 1 km/h or better.
b. **Detection Range:** A minimum detection range of 100 meters, with the capability to cover the full width of multi-lane haul roads.
c. **Speed Measurement Range:** Capable of accurately measuring vehicle speeds from as low as 5 km/h to a minimum of 80 km/h.
d. **Measurement Rate:** A high measurement rate (e.g., 8 Hz or greater) to ensure accurate capture of fast-moving vehicles and provide multiple readings per vehicle pass.
e. **Target Differentiation:** The sensor must be able to differentiate between multiple vehicles in its field of view and accurately report the speed of each individual target.
f. **Digital Speed Display Board:** In each of the gantries, there shall be digital speed display board of the vehicles passing by for both to-fro lanes in their viewing directions. The speed shall display the vehicle number also. The display boards shall be large enough to be able to be viewed from at least 100 m in day and night. There shall be provision of displaying the speed of at least 03 vehicles (along with the vehicle no.) in ascending distance from the gantry.

iii. **Environmental Hardening and Durability:** The radar sensor must be designed for continuous operation in harsh industrial environments.

a. **Ingress Protection:** The sensor housing must have a minimum rating of IP67, ensuring it is fully protected against dust ingress and can withstand temporary immersion in water.
b. **Operating Temperature:** The sensor must be rated for an operational temperature range of at least -30°C to +70°C.
c. **Housing and Construction:** The sensor housing shall be constructed from anodized aluminum or a similarly robust, corrosion-resistant material. It must be certified to withstand high levels of shock and vibration typical of a mining environment.
d. **Certifications:** The sensor should have relevant certifications for industrial use.

iv. **Vehicle Identification System:** The system shall use a dedicated camera system to automatically identify each vehicle that commits a speed violation.

a. **Indicative Technology:** Vehicle identification shall be performed by a high-performance Automatic Number Plate Recognition (ANPR) camera system having onboard processing or designed to work with an edge processor to read vehicle license plates from captured images. Standard surveillance cameras are not acceptable for this application.

b. **Performance Expected:** The ANPR camera system must meet or exceed the following criteria to ensure reliable identification in challenging mine conditions:

i. **Resolution:** A minimum image sensor resolution of 4 Megapixels (e.g., 2688 X 1520) to capture fine details on license plates, even from a distance.

ii. **Low-Light and Night Performance:** The camera must provide clear, readable images 24/7. This requires a highly sensitive image sensor (e.g., minimum illumination of 0.0005 Lux in color) and powerful, built-in Infrared (IR) illumination with an effective range of at least 50 meters. The IR wavelength shall be 850 nm for optimal performance with reflective plates.

iii. **Image Quality and Clarity:**

a. **Wide Dynamic Range (WDR):** The camera must feature true hardware-based WDR of at least 140 dB to manage scenes with extreme contrast, such as bright headlights against a dark background or deep shadows on a sunny day, preventing plate details from being washed out or obscured.

b. **Shutter Type:** A global shutter is mandatory to eliminate motion blur and ensure crisp images of license plates on vehicles moving at high speeds.

c. **Lens:** A motorized varifocal lens (e.g., 8-32 mm) is required to allow for precise remote adjustment of the field of view during commissioning to optimize plate capture at each specific location.

iv. **ANPR Accuracy:** The ANPR engine (software) must achieve a minimum character recognition accuracy of 98% under all specified operational and environmental conditions. This includes performance on plates that are dirty, dusty, or partially obscured by mud, which is a common occurrence in mining.

v. **Environmental Hardening and Durability:** The ANPR camera must be built to withstand the rigors of the mine site.

a. **Ratings:** The camera housing must be certified with a minimum IP67 rating for dust and water protection and an IK10 rating for vandal resistance.

b. **Operating Conditions:** The camera must be rated for the same wide temperature range as the radar sensor (-30°C to +70°C).

c. **Optional Features:** The solution provider should propose optional features such as an integrated wiper/washer system to maintain lens clarity in dusty or muddy conditions.

7. **Edge Computing and Communication Gateway:** Each of the 25 monitoring locations shall be equipped with a dedicated industrial-grade edge computing device (IIoT Gateway) to ensure local data processing, system resilience, and efficient communication. This architecture is mandated to provide real-time responsiveness and to guarantee data integrity, as it allows the system to function and buffer data even during periods of network instability.

a. **Hardware Specifications:** The edge gateway must be a purpose-built industrial computer meeting the following specifications:

i. **Processing Unit:** A robust ARM-based processor (e.g., NXP i.MX8M, TI Cortex A8/A9, or equivalent) with sufficient power to perform real-time data aggregation from the radar, run the ANPR software, and execute violation logic.

ii. **Memory and Storage:** Minimum of 2GB DDR3L RAM and 16GB of onboard eMMC flash storage. The device must also support a high-capacity microSD card (up to 512GB) for local data buffering and logging.

iii. **Connectivity:**

a. **WAN:** Integrated 4G/LTE cellular modem with dual SIM card slots for carrier redundancy, ensuring continuous network connectivity.

b. **LAN:** Minimum of two (2) 10/100/1000 Mbps Ethernet ports for connection to the ANPR camera and other network devices.

c. **Serial/CAN:** Necessary I/O ports to interface directly with the Doppler radar sensor, such as RS-485 and/or CAN bus interfaces.

iv. **Power:** Must support a wide-range DC power input (e.g., 10-48 VDC) and include built-in overvoltage and surge protection suitable for industrial power sources.

b. **Environmental Hardening:** The gateway must be designed for deployment in harsh industrial enclosures.

i. **Thermal Design:** A fanless, passive cooling design is mandatory to prevent dust ingress and improve reliability.

ii. **Operating Temperature:** Must support a wide operating temperature range of -40°C to +70°C.

iii. **Enclosure Rating:** The device itself should have a minimum rating of IP30.

8. The integrated system of radar, ANPR camera, and edge gateway shall form a self-contained data acquisition and processing node at each gantry. This distributed intelligence is fundamental to the overall system's performance and reliability; and hence, non-negotiable. The solution provider must ensure that these components will be integrated, powered, and protected within the gantry enclosure to function as a single, cohesive unit. Furthermore, the establishment of this local edge computing network can be used and hopped by any other third-party system at place in MCL. No additional charge shall be given for such multi-use of the system.

C. Central Software Platform: Dashboard and Analytics

1. The core of the Speed Monitoring System shall be a centralized, web-based software platform that serves as the single point of control, monitoring, and analysis for the entire operation. The platform must be secure, scalable, and intuitive for all user types.

a. **Core Architecture:** The solution provider shall provide a robust software application, accessible through modern web browsers (e.g., Google Chrome, Mozilla Firefox, Microsoft Edge) without the need for any client-side plugin installation. The architecture must be designed to handle real-time data streams from all 25 monitoring locations simultaneously, process high volumes of violation data, and securely store evidentiary records. The solution provider must host the data in MCL designated cloud platform and on-premise servers (NAS-type) and must provide a comprehensive security architecture document detailing measures for data encryption (both in transit using TLS 1.3 and at rest using AES-256), user authentication, access control, and protection against common cybersecurity threats (like SQL injection, cross-site scripting).

b. **Dashboard Functionality:** The main dashboard shall provide an at-a-glance, holistic view of the fleet's speed compliance and system health. The design must adhere to best practices for effective fleet management dashboards, prioritizing clarity, relevance, and actionable information. Key dashboard components shall include:

i. **Interactive Map View:** A geo-spatial map of the Lakhanpur OCP displaying the precise locations of all 25 gantry systems. Each gantry icon must be color-coded to indicate its real-time operational status (e.g., Green: Online and Operational; Red: System Fault/Offline; Yellow: Recent Violation Detected). Clicking on an icon shall provide a summary of that location's activity.

ii. **Real-Time Event Feed:** A continuously updating log that displays speed violation events as they are detected across the mine. Each entry should be a hyperlink to the detailed violation record.

iii. **Key Performance Indicator (KPI) Widgets:** A series of clear, graphical widgets presenting critical KPIs. These visualizations (e.g., bar charts, line graphs, pie charts) are essential for quick comprehension and trend analysis. Mandatory KPIs include:

a. Total Violations (Today / This Week / This Month)
b. Violation Trend Chart (violations per day over the last 30 days)
c. Top 5 Violating Contractors (by violation count)
d. Top 5 Violation Hotspots (gantry locations with the highest violation counts)
e. Any other KPI decided by MCL (within 180 days of Phase – I) to inducted in the system without

additional cost to MCL.

2. **Violation Management Module**: This module is the primary operational interface for reviewing and actioning speed violations. It must be designed as a structured workflow system to ensure every potential violation is processed consistently and transparently. The module must feature a **Violation Review Screen** that consolidates all pertinent information and evidence for a single violation event. This screen is critical, as it forms the basis for financial decisions and must be irrefutable. The view must include:

   a. **Evidentiary Media:** A high-resolution, zoomable image clearly showing the vehicle's license plate, alongside a wider-angle context image or a short (5-10 second) video clip of the vehicle passing the gantry.
   b. **Violation Data:** A clear display of all critical data points: Recorded Speed, Posted Speed Limit at that location, Overspeed Amount (in km/h and percentage), Location Name/ID, and precise Date and Time.
   c. **Vehicle and Contractor Information:** The system must automatically look up and display the Vehicle Registration Number, the associated Contractor's Name, and any other relevant vehicle details stored in the master database.
   d. **Workflow and Audit Trail:** The screen must provide clear action buttons for authorized users (e.g., "Validate Violation," "Reject Violation"). A reason must be mandatory for rejection. Every action taken on the violation record (e.g., viewed by, validated by, commented on) must be logged in an immutable audit trail, stamped with the user's ID and a timestamp.

3. **Reporting and Analytics Engine:** The platform must include a powerful reporting engine capable of generating detailed, professional reports for analysis, compliance, and contractor management. All reports must be exportable to PDF for official documentation and CSV for further data analysis or any other format desired by MCL.

   a. **Standard Reports:** A suite of pre-configured reports must be available for generation on-demand with user-selectable date ranges and filters:

      i. **Daily/Weekly/Monthly Violation Summary:** An aggregate report summarizing all violation activity.
      ii. **Contractor Performance Report:** A detailed report focused on a single contractor, listing all their vehicles' violations, providing performance trends, and serving as an official annexure for billing cycles.
      iii. **Location Analysis Report:** A report to identify high-risk areas ("hotspots") by analyzing violation frequency, time of day, and severity at each gantry location.
      iv. **Vehicle History Report:** A complete violation history for a single vehicle, useful for identifying habitual offenders.
      v. **System Audit Report:** A log of all administrative actions, user logins, and changes made within the system.

   b. **Custom Report Builder:** The system shall provide a user-friendly interface that allows authorized users to build and save custom report templates by selecting desired data fields, applying complex filters (e.g., location, contractor, speed threshold, time of day), and defining the report layout.

   c. **The Official Speed Violation Report:** The system's ability to generate a comprehensive and legally robust violation report is paramount. This report is not merely a data log; it is an evidentiary document that forms the basis of a financial penalty and must be designed to withstand scrutiny and potential disputes from contractors. Its integrity is fundamental to the project's success. To this end, every automatically generated Speed Violation Report must contain, at a minimum, the data fields specified in the following table. The solution provider must also implement measures to ensure the authenticity of the evidence, such as cryptographic hashing of image files, which can be included in the report. A sample data field is illustrated in Table – 01. Note that this will be updated/changed as per SOPs and other guidelines at the prerogative of MCL from time to time without additional cost to MCL:

Table 01: Sample Data Fields for Speed Violation Report

Sl	Field Name	Description	Data Type	Example
1	Violation ID	A unique, system-generated, non-sequential identifier for the violation event.	Alphanumeric	VIO-LKP-2024-001234
2	Date of Violation	The calendar date on which the violation occurred (DD-MM-YYYY).	Date	25-10-2024
3	Time of Violation	The precise time of the violation (HH:MM:SS, 24-hour format), synchronized via NTP.	Time	14:32:15
4	Location ID	The unique identifier assigned to the gantry where the violation was detected.	Alphanumeric	LKP-G07
5	Location Name	A human-readable, descriptive name for the gantry location.	Text	Crusher Feeder Road Crossing
6	Vehicle Reg. No.	The vehicle registration number as captured and interpreted by the ANPR system.	Alphanumeric	OD15AXXXX
7	Contractor Name	The full name of the contracting company associated with the vehicle.	Text	ABC Logistics Pvt. Ltd.
8	Posted Speed Limit	The official speed limit in km/h for the road segment at the time of violation.	Integer	40
9	Recorded Speed	The speed of the vehicle in km/h as measured by the Doppler radar sensor.	Integer	58
10	Overspeed Amount	The calculated difference between recorded speed and the speed limit (in km/h).	Integer	18
11	Evidentiary Image	A high-resolution, time-stamped image clearly showing the vehicle and its license plate.	Image (Embedded)	
12	Image Hash (SHA-256)	A cryptographic hash of the evidentiary image file to ensure its integrity.	Alphanumeric	a1b2c3d4...
13	Sensor ID	The unique serial number or identifier of the radar sensor that recorded the speed.	Alphanumeric	RDR-IND-98765
14	Sensor Last Calib. Date	The date of the last official calibration and certification for the specific radar sensor.	Date	15-01-2024
15	Validating Officer ID	The employee ID of the MCL official who reviewed and validated the violation.	Alphanumeric	MCL-54321
16	Validation Timestamp	The date and time when the violation was officially validated in the system.	Date Time	25-10-2024 16:45:30

D. Mobile Application and Notification Services

1. To ensure that key personnel can monitor operations and respond to safety events from anywhere within the mine, the solution provider shall develop and deliver dedicated, native mobile applications for both Android and iOS platforms (mobile and tab/iPad friendly). The mobile application is a critical tool for proactive, on-the-ground safety management, not merely a passive viewer for the web dashboard.

2. Application Functionality: The mobile applications must provide a secure and responsive user experience, with functionalities tailored for mobile use cases. All features must be governed by the same Role-Based Access Control (RBAC) system as the web platform. Core functionalities shall include:

    a. Secure Login: Users must log in with their system credentials, with support for biometric authentication (fingerprint/face ID) for enhanced security and convenience.
    b. Mobile Dashboard: A simplified dashboard presenting the most critical KPIs, optimized for small screens.
    c. Live Map Monitoring: A real-time, GPS-enabled map view showing the user's current location relative to the 25 monitoring gantries. The map must display the live status of each gantry.
    d. Violation Management: Users must be able to view a list of recent speed violations. Authorized supervisors must have the ability to drill down into violation details, review all evidentiary media (images and video clips), and perform validation or rejection actions directly from the app.
    e. Reporting: The ability to access, view, and share standard reports in PDF format.
    f. Search Functionality: A powerful search tool to quickly find specific vehicles, contractors, or violation records.

3. User Experience (UX) and Interface (UI) for Industrial Environments: The application's design must be purpose-built for the industrial mining environment, prioritizing usability, clarity, and performance over purely aesthetic considerations. The design process must follow a "content-first" philosophy, ensuring that essential data is presented clearly and without clutter. Mandatory UX/UI design principles include:

    a. High-Contrast Visuals: The UI must feature a high-contrast color scheme and large, legible fonts to ensure readability in the bright glare of direct sunlight and in low-light conditions.
    b. Thumb-Friendly and One-Handed Operation: The layout must be optimized for one-handed use. Critical navigation elements, buttons, and interactive controls should be placed within easy reach of a user's thumb, acknowledging that operators may be holding other equipment or standing while using the app.
    c. Large Touch Targets: All buttons, toggles, and interactive elements must be significantly larger than standard consumer app guidelines to accommodate users who may be wearing work gloves or operating in a vibrating vehicle cab.
    d. Performance and Offline Capability: The application must be lightweight, launch quickly, and remain responsive even on networks with variable bandwidth. It should intelligently cache essential data to provide limited functionality (e.g., viewing previously loaded violations) even if the network connection is temporarily lost.
    e. Platform Consistency: While tailored for industrial use, the app must still adhere to the fundamental design principles of Android (Material Design) and iOS (Human Interface Guidelines) to provide a familiar and intuitive user experience.

4. Real-Time Notification System: The backend platform must incorporate a highly reliable, low-latency notification engine to push real-time alerts to the mobile applications. The speed of notification is critical, as it directly impacts the ability of a supervisor to intervene in a potentially unsafe situation. Therefore, the system must be architected to deliver 99% of critical notifications within 10 seconds of the violation event detection.

5. The notification system must be highly customizable at the individual user level, allowing users to create personalized alert profiles to avoid notification fatigue. Customization options must include the ability to subscribe to or filter notifications based on:

a. **Geographic Location:** Receive alerts only for violations occurring at specific gantries or within a defined operational area of the mine.
b. **Violation Severity:** Set a threshold to receive alerts only for egregious violations (e.g., more than 20 km/h over the speed limit).
c. **Specific Contractor(s):** Allow supervisors to monitor only the vehicles belonging to the contractors under their direct supervision.
d. **Time of Day:** The ability to schedule "quiet hours" or receive notifications only during shift times.
e. **Vehicle Groups:** The ability to create custom groups of vehicles to monitor.
f. **Or any other categorized filter** that may be asked by MCL without additional cost to MCL.

6. The system should be built on an event-driven architecture to ensure scalability and timely delivery, capable of handling a high volume of concurrent events without failure.

E. Enterprise Integration for Automated Financial Deduction

1. The integration with MCL's SAP Enterprise Resource Planning (ERP) system is the most critical and highest-value component of this project. This functionality transforms the SPEED MONITORING SYSTEM from a simple monitoring tool into an automated financial control system. The solution provider's solution must provide a seamless, secure, and fully auditable workflow for applying financial penalties for speed violations directly within SAP. The solution provider must demonstrate prior experience and technical expertise in integrating third-party operational systems with enterprise-scale SAP environments.

2. **SAP Integration Workflow:** The solution provider shall design and implement an automated, end-to-end business process for financial deductions. A detailed workflow diagram and process description must be a key deliverable. The workflow must adhere to the following steps:

a. **Trigger Event:** An authorized MCL user reviews a speed violation in the SPEED MONITORING SYSTEM dashboard and clicks the "Validate & Send to SAP" button. This manual validation step is a critical business control before any financial transaction is initiated.
b. **Data Compilation:** The SPEED MONITORING SYSTEM backend compiles a structured data packet in JSON format containing all mandatory violation details as specified in Table – 01; including the Violation ID, Contractor Solution provider Code, Vehicle Number, and the calculated penalty amount.
c. **Secure API Call:** The SPEED MONITORING SYSTEM makes a secure, authenticated API call to a dedicated endpoint provided by MCL's SAP system.
d. **SAP Processing:** The SAP system receives the API request. It performs its own internal validations (e.g., confirms the existence of the solution provider code, checks for duplicate Violation IDs). Upon successful validation, it automatically creates a financial posting. This could be implemented through various SAP mechanism, such as creating a solution provider deduction, applying a penalty condition to a service purchase order, or generating a credit memo. The specific mechanism will be determined in consultation with MCL's finance and IT teams.
e. **Synchronous Acknowledgment:** The SAP system must provide a synchronous response to the API call, indicating either success or failure. A success response will include a unique SAP document number for the transaction. A failure response will include a specific error code and message (e.g., "Invalid Solution provider Code," "Duplicate Violation ID"). This two-way handshake is mandatory for transactional integrity.
f. **Status Update and Logging:** The SPEED MONITORING SYSTEM receives the SAP response. If successful, it updates the violation record's status to "Deduction Processed" and stores the SAP document number. If it fails, the status is updated to "SAP Integration Failed," and an alert is generated for administrative review. The entire transaction, including the request payload and the SAP response, is logged in an immutable audit trail.

g. **Error Handling:** The system must include a robust error-handling and retry mechanism. For transient errors (e.g., network timeout), the system should automatically retry the API call a configurable number of times before flagging it as a failure.

3. **API Specifications**: The solution provider's system must expose a modern, secure, and well-documented RESTful API to facilitate the integration.

   a. **Authentication and Authorization:** API access must be strictly controlled. The OAuth 2.0 client credentials grant flow is the mandated authentication protocol to ensure secure server-to-server communication between the SPEED MONITORING SYSTEM and SAP. The solution provider will be responsible for implementing the OAuth 2.0 provider logic.
   b. **API Documentation:** The solution provider must provide comprehensive API documentation conforming to the OpenAPI Specification (formerly Swagger). This documentation must detail all available endpoints, request/response schemas, authentication methods, and error codes.
   c. **Versioning:** The API must be versioned to allow for future enhancements without breaking the existing integration.
   d. **SAP API Consumption:** The solution provider's solution must be capable of consuming standard or custom APIs exposed by SAP. The solution provider must work closely with the MCL SAP team to finalize the integration specifics, whether it involves using standard OData services like the Supplier Invoice API or Business Partner API, or interfacing with a custom-developed BAdI or RFC.

4. **Data Governance and Security**: Given that this integration directly triggers financial transactions, the security and governance standards must be equivalent to those of a financial system.

   a. **Data Encryption:** All data transmitted between the SPEED MONITORING SYSTEM platform and SAP must be encrypted in transit using, at minimum, Transport Layer Security (TLS) 1.2, with a preference for TLS 1.3.
   b. **Credential Management:** The solution provider must describe their secure process for storing and managing sensitive credentials, such as API keys and OAuth client secrets, using industry-standard practices like a secure vault.
   c. **Auditability and Non-Repudiation:** The system must provide a complete and tamper-proof audit log of every transaction attempted with the SAP system. This log is critical for financial reconciliation, dispute resolution, and auditing purposes. It must be possible to trace every deduction in SAP back to a specific, validated violation event in the SPEED MONITORING SYSTEM, complete with all its evidentiary data. This creates a powerful, direct feedback loop, linking a driver's operational behavior to an immediate and verifiable financial consequence for the contractor, which is a far more effective deterrent than delayed or manual penalty systems.

F. System Administration and User Management

1. The Speed Monitoring System shall include a comprehensive administrative backend for managing users, configuring system parameters, and maintaining operational integrity. Central to this is a flexible and granular access control system.
2. **Role-Based Access Control (RBAC):** The system must comply to an RBA-Sheet (Role-Based Access Control Sheet) issued by MCL. This is a non-negotiable security requirement to ensure that users are granted access only to the information and functionalities necessary to perform their designated duties, adhering to the principle of least privilege. This structured approach is essential not only for security but also for operational efficiency, as it tailors the user interface and capabilities to the specific needs of different roles, preventing information overload and unauthorized actions.
3. The system administrator must have the ability to create, modify, deactivate, and assign users to one or more predefined roles. The permissions associated with each role must be configurable. The initial implementation

must include, at a minimum, the roles and permissions outlined in the matrix below. This matrix serves as a clear blueprint for the required access control logic, enabling secure collaboration between different MCL departments (Operations, Finance, Safety) and external stakeholders (Contractors) on a single, unified platform.

Table – 02: User Roles and Permissions Matrix (Indicative ONLY)

Feature / Action	MCL System Administrator	MCL Supervisor	Finance Officer	Contractor Administrator
Dashboard & Monitoring				
View Live Dashboard & Map	Full Access	Full Access	View Only	View Own Fleet Only
View All Violation Data	Full Access	Full Access	View Validated Violations Only	View Own Fleet Violations Only
Violation Management				
Validate / Reject Violations	Yes	Yes	No	No
Add Comments to Violations	Yes	Yes	Yes	Yes (on own violations)
Reporting & Analytics				
Generate All System Reports	Yes	Yes	Yes	Generate Own Fleet Reports Only
Create Custom Report Templates	Yes	Yes	No	No
SAP Integration				
Initiate "Send to SAP" action	No (Done by Supervisor)	Yes	No	No
View SAP Integration Logs	Full Access	View Only	View Only	No
System Administration				
Manage All User Accounts	Yes	No	No	Manage Own Company's Users
Configure System Settings (Speed Limits, Locations)	Yes	No	No	No
View System Health & Audit Logs	Yes	View Only	No	No

4. The above table is indicative. A detailed administrative setup and RBAC sheet for work execution shall be issued to all stakeholder within 15 days of the issue of work order.

G. Project Deliverables, Commissioning, and Operations.

1. The sections before this; envisions the typical system required for the work; and culminates as following hard and soft deliverables:

a. A physical speed monitoring system (gantry structure with sensor ecosystem and digital speed display board for to-fro traffic) located at 25 locations of Lakhanpur Area.
b. A software ecosystem to act as monitoring hub in a designated location provided by MCL.
c. A native mobile application platform agnostic to device-type and OS-type.
d. Operation of the above for the period of work execution.
e. A network to facilitate all communication integration.
f. Data management policy (including security) as envisaged in the document.
g. Compliance to data flow chart (to be provided by MCL to successful bidder ONLY).
h. Compliance to any applicable legal matters on the system.
i. User-friendly interfaces of HMI.
j. Any other changes desired by MCL from time to time as per the terms and conditions of the work.

2. Training Program: The solution provider shall develop and deliver a comprehensive training program for MCL personnel. The training must be tailored to the specific user roles defined in Table – 02; ensuring all users are proficient in operating the system. This is a critical step for user adoption and maximizing the system's effectiveness. The training program shall consist of the following modules:

   i. System Administrator Level Training: An in-depth, multi-day technical course covering all aspects of system configuration, user and role management, backend maintenance, troubleshooting, and management of the SAP integration interface.
   ii. Operational Supervisor Level Training: A hands-on course focused on the day-to-day use of the system, including interpreting the dashboard, the complete violation validation workflow, generating and analyzing reports, and using the mobile application in the field.
   iii. End-User Level Training: A separate session for contractor administrators and other view-only users, focusing on how to access their specific data, understand violation reports, and manage their own user accounts.

3. Documentation: The solution provider must deliver a complete set of professional documentation in English, provided in searchable digital format in soft and 03 hard copies. The documentation package must include:

   i. System Architecture and Network Diagrams.
   ii. As-Built Drawings for Gantry Structures and Foundations.
   iii. Detailed Technical Datasheets and Manuals for all Hardware Components.
   iv. Comprehensive Software User Manual for all user roles.
   v. System Administrator Guide.
   vi. Complete API Documentation for the SAP Integration.
   vii. Any other documentation required for successful operation and emergency troubleshooting of the system.

4. Day-to-Day Upkeep: The solution provider shall ensure with adequate manpower deployed at the SIC-designated location the system's availability, long-term accuracy, reliability, and the legal defensibility of the data it generates. The scope shall include:

   a. Scope of Services: The contract must cover both preventive and corrective maintenance for all hardware and software components of the system, including all 25 on-site installations and the central software platform. This includes all parts, labor, and travel costs.
   b. The solution provider must commit to:
      a. System Uptime: A guaranteed uptime of above 99 % for the entire system for each individual gantry monitoring location, calculated on a monthly basis.
      b. Support Response Time: Please see payment terms document for this.
      c. Resolution Time: Please see payment terms document for this.

c. **Preventive Maintenance (PM):** The solution provider must provide a detailed PM schedule, to be executed quarterly. PM activities shall include physical inspection of all gantry structures, cleaning of camera lenses and sensor radomes, checking enclosure seals, and verifying power and network systems. The schedule shall be available to MCL for informational purposes only. All maintenance activities are to be undertaken by the solution provider.

d. **Sensor Calibration and Certification:** This is a critical and mandatory component of the upkeep. To ensure the continued accuracy and legal validity of the speed measurements, which are the basis for financial penalties, the solution provider must perform an on-site recalibration of every Doppler radar sensor on an annual basis or as per extant guidelines in vogue. Best and legally acceptable practices for this exercise must be followed. The solution provider shall indemnify MCL from matters arising out of dispute of such nature with the external contractors of MCL; on any such matters being pursued by any party whatsoever and whosoever.

---------- End of Document ----------

Annexure – 02: Format of BOQ

RFQ Reference: क्रमांक संख्या: एम.सी.एल/मुख्यालय/ नवोन्मेष विभाग/2025-26/1191 दिनांक: 06/10/25

A. Timeline

After the award of work, site-access permission or site-handover shall be given by MCL within 15 days of the issue of work order. Thereafter, the project is envisaged to be executed in two phases after site-access permission:

1. Phase – I: 180 days. (06 months for installation and commissioning): The installation and commissioning of the system at designated locations (all 25) at Lakhanpur Area must be completed within 180 days from the day of issue of site-access permission or site-handover by SIC. Within these 180 days, 05 locations are envisaged to be installed first along with supporting software systems, connectivity, etc. An SCR (System Commissioning Report) shall be issued by MCL. Thereafter, remaining 20 locations are to be installed and integrated into the finetuned system. All these activities have to be completed within 180 days. After installation in all 25 locations, an FSDR (Full System Deployment Report) shall be issued by MCL.

2. Phase – II: 1095 days after issue of FSDR. (03 years (1095 days) of operations and maintenance) of 25 locations.

3. Hence, total timeline of the work is as given in Table – 01 below:

Table – 01: Timeline and Period of Work Execution

Sl	Activity	Period of Work	Remarks
1	Site-access permission	15	No payment envisaged.
2	Phase – I	180	One-time payment.
3	Phase – II	1095	Monthly payment based on availability.
4	Total Work	1290	Total period of work execution.

B. BOQ – Bill of Quantities

The BOQ for response to the RFQ is as given below in Table – 02:

Table – 02: BOQ

Sl	Event	Scope of Deployment	Basic Cost	GST	Total
1	FSDR – Full System Deployment Report [Phase – I]: 180 Days for full deployment.	As per Annexure – 01.			
2	O&M for 25 locations. [Phase – II] 1095 Days of Operation	As per Annexure – 01.	[X]**		
3	Total				

*Operation and maintenance.

**In cell [X], please provide breakup in the form 'A X 36 = B', where 'A' is the monthly bill of O&M of 25 locations and 'B' being the total cost of operation in Phase – II in 25 locations. Penalty shall be deducted proportionately per site basis. Please see payment terms for the same.

C. NOTE:

1. Evaluation of tender (if floated) shall be on total-cost-basis (total work value) and NOT item-wise.
2. Inconsistency in the tables above while tendering response to this RFQ shall be deemed as invalid response. MCL reserves the right to seek clarification or terminate evaluation of the response.

---------- End of Document ----------

Annexure – 03: Payment Terms

RFQ Reference: क्रमांक संख्या: एम.सी.एल/मुख्यालय/नवोन्मेष विभाग/2025-26/1191 दिनांक: 06/10/25

A. Phase – I

1. Payment shall be made as per BOQ upon issue of SCR (System Commissioning Report) and FSDR (Full System Deployment Report).

B. Phase – II

1. Payment shall be made as per BOQ to the successful bidder based on auto-generated '**availability'** report of the entire system; on monthly basis, proportionated on hourly basis (location-wise); for deductions, if any.
2. The availability shall be calculated as follows:

% Availability of Entire System = (Available Hours / 24 Hours) X 100%

3. The availability shall be auto-generated/calculated and must be in-built in the dashboard itself. Biometric / digital signature authentication can be explored to enable role-based access. This summarized document shall form the basis of monthly payment.
4. Facility for auto-updation of availability data WITHOUT MANUAL entry shall be provided by the solution provider integrated with any third-party application designated by MCL (viz. SAP). No additional cost of integration shall be provided by MCL.
5. The availability of the system shall always be above 99% (cumulative).
6. Penalty shall be deducted, site-wise, as follows:

Sl. No.	Availability	Penalty
1	Above 99%	0
2	99% and below.	Proportionate deduction from dues of the successful bidder i.e., [98-99]: Penalty of 1%. [97-97.99]: Penalty of additional 1% over and above previous slot of 1%. Further calculation of penalty shall be done likewise for slots of [96-96.99] and so on.

7. Unavailability of ANY of the scope of work in any site shall be deemed as NON-AVAILABILITY of the entire system in that location and shall be treated accordingly for penalty calculations.
8. In case of non-availability of any sub-component (features of the integration platform) of the system, the payment for the period of non-availability shall not be made. Additionally, penalty shall be deductible from the remaining payment.
9. The specific breakdown or reason for unavailability should be addressed within 02 hours and restored within 24 hours. No formal notice shall be given for breakdown or unavailability.
10. This shall be applicable for all the locations/units.
11. In other words, all breakdowns should be attended within two hours and restored within 24 hours. It shall be assumed that the successful bidder has real-time knowledge of any such breakdown occurrence, even without formal intimation by MCL authorities (as the system is real-time).
12. In case the breakdown is not restored within 7 days by the successful bidder, MCL shall have the right to get the equipment restored by any other agency and the cost of such restoration along with 10% handling charges; additional, shall be deducted from the dues of the successful bidder.

13. It must be noted that notwithstanding unavailability or breakdown of the system, loss of data is not acceptable. In such occurrences, payment of the particular unit for that period (10 days to be considered for withholding entire month's payment) shall be withheld till recovery of the data.
14. All breakdowns shall be considered for penalty ONLY to those attributable to the solution provider ONLY..
15. Maintenance of the system shall be with permission of SIC and the down-time due to the same shall be NOT considered for penalty ONLY in cases where the total daily downtime is less than 60 minutes. Any maintenance must be done after issuing maintenance notice in the portal so that SIC can take measures for safe operation of particular location and the impending maintenance activities as well.

---------- End of Document ----------

Annexure – 04: List of Documents Envisaged

RFQ Reference: क्रमांक संख्या: एम.सी.एल/मुख्यालय/नवोन्मेष विभाग/2025-26/1191 दिनांक: 06/10/25

A. The Annexure – 04 consists of two parts as follows:

1. Part I – Checklist of Documents for Response to RFQ:
   The response to this RFQ shall only be considered if supporting documents as per indicated in subsequent pages of this annexure is furnished along with the BOQ.

2. Part II – Checklist of Tentative Documents for Participation in the Tender:
   These are tentative/indicative documents which shall be required for participation in the tender (which is a sole prerogative of MCL to consider). The checklist is to facilitate early preparation of prospective bidders for impending tender (if floated). These documents are NOT required to be submitted in the RFQ response.

B. Please Note:

1. Merely based on this RFQ, MCL is NOT obligated to float a subsequent tender based on response(s) received or a modified version thereof.
2. Follow-ups to this RFQ shall NOT be entertained.
3. No reason shall be provided regarding consideration or non-consideration of RFQ response.
4. Respondents of this RFQ are highly encouraged to visit the sites BEFORE responding to this RFQ.
5. In case of identical response; the one with site visit shall be considered. Note that this has nothing to do with subsequent eligibility in participation of tender (if floated).
6. MCL may, without prior notice, modify checklist(s) provided as per part – II of this annexure and is NOT bound to freeze the same provided here at the time of floating the tender (if any).

1. Interested legal entities are required to submit scanned copy of the documents as per the table below with a cover letter tabulating the documents furnished (as in the table) that correspond to the claims made:

Table – 4.1.1: Documents for Response to RFQ

Sl	RFQ Response Document	Information to be Furnished	Remarks
1	BOQ	Cost of work execution	Annexure – 03.
2	Legal status document	Status of legal entity	Copy of legal status document.
3	MSE/Startup Certificate	MSE/Startup	Copy of MSE/Startup Certificate.
4	PAN	PAN	Copy of PAN.
5	GST	GST	Copy of GST certificate.
6	Work Experience	Proof of work executed of similar nature.	Furnish proof of work executed of similar nature viz. *development of vehicle speed monitoring system in mining conditions.* Experiences of academic nature shall NOT be acceptable.
7	Assurance of Site Visit	An undertaking in the format given below that site visit of the work experience claimed and furnished shall be facilitated in case team of MCL intends to visit. ------- [Format] ------- ~ Under Letter Head ~ Reference_____ Date:_____ *We hereby assure that we will facilitate visit of the sites of our work execution (Work Reference: _____ Dated_____) submitted as part of our RFQ response; in case MCL team intends to visit and verify.* *Signed* *Authorized Person*	This is to assess the nature and quantum of work actually executed on ground by the RFQ respondent versus the work experience claimed/furnished to accord realistic parity in assessment of quotation submitted.
8	Other(s)	Any other document to support the claim of Sl. No. 06 above.	Scanned copy of the document to be furnished.
9	Annexure – 01	--	Signed and scanned copy.

2. Please Note:
   a. Signature of authorized personnel is required on all pages.
   b. Pending/incomplete documents are not acceptable.
   c. ONLY response(s) in the format provided shall be acceptable.
   d. Modified or incomplete BOQ shall NOT be acceptable.

1. In case a tender is floated, bidders shall be required to submit scanned copy of the documents as per the table below with a cover letter tabulating and highlighting the content of the documents that corresponds to the claims made as part of eligibility by the bidder for each documents submitted (in a single .pdf document). The table shall indicate work experience quantum, period of work, location, exact clause of work order/BOQ of the work and/or percentage of work if composite work has been executed. ***Bids shall NOT be accepted without a cover letter*** accompanying and indicating the submitted documents.

Table – 4.2.1: Documents for Participation in Tender

Sl	Eligibility Criteria	Information to be furnished by the Bidder	Scanned copy of documents, to be uploaded by in support of information/ declaration furnished online by the Bidder against Eligibility Criteria as Confirmatory Document
1	**Work Experience** The Bidder must have experience of works (includes completed / ongoing) of similar nature valuing 50 % of the annualized estimated value of the work put to tender (for period of completion over 1 year) / 50 % of the Estimated value of the work (for completion period up to one year) put to Tender, in any year (consecutive 365 days) during last 7(seven) years ending last day of month previous to the one in which bid applications are invited. **Definition of Similar Work*:** '*development of vehicle speed monitoring system in mining conditions.* *To be read along with Point – 'C' of the last column. "Annualized value" of the work shall be calculated as the "(Estimated value ÷ Period of completion in Days) x 365". The value of executed works shall be given a simple weightage to bring them at current price level by adding 5% for each completed year (total number of days/365) after the end date of experience till the last day of month previous to one in which e-Tender has been invited.	1. Start date of the year for which work experience of Bidder is to be considered for eligibility. 2. Start date & end date of each qualifying experience (similar nature). 3. Work Order Number/Agreement Number of each experience. 4. Name & address of Employer/Work Order Issuing authority of each experience. 5. Percentage (%) share of each experience (In case the experience has been earned by the Bidder as a partner in a joint venture firm/partnership firm then the proportionate value of experience in proportion to actual share of Bidder in that joint venture firm/ partnership firm will be considered against	A. For work experience, Bidders are required to submit completed Work Experience Certificate along with work order, issued by the employer against the experience of **similar work** containing all the information sought. B. BOQ, TDS etc. may be sought during clarification or along with deficient documents, if felt necessary by the Tender Evaluation Committee. C. The documents submitted for work experience shall indicate the following or must be self-evident: 1. Use of camera along with active sensor system to detect speed of vehicles. 2. Deployment of the system in mining conditions. 3. Dashboard to monitor information of speed violations, vehicle identification, etc. in real-time.

Sl	Eligibility Criteria	Information to be furnished by the Bidder	Scanned copy of documents, to be uploaded by in support of information/ declaration furnished online by the Bidder against Eligibility Criteria as Confirmatory Document
		eligibility else it shall be taken as 100%). 6. Executed Value of work against each experience	
2	**The Availability of Working Capital** Evidence of possessing adequate working capital (at least 20% of the "Annualized value or Estimated value whichever is less" of this work) inclusive of access to lines of credit and availability of other financial resources to meet the requirement. The Bidder should possess the working capital within three months prior to the date of opening of tender	1. Amount of available working capital inclusive of lines of credit and availability of other financial resources 2. Date on which the Bidder possesses the required working capital 3. Date of issue of W.C. Certificate by CA 4. Name of the Chartered Accountant (CA) 5. Membership Number of CA who certifies the Bidder's working capital on a particular date. 6. Unique identification number of the document (UDIN)	Certificate with UDIN of Working Capital issued by a Practicing Chartered Accountant having a membership number with Institute of Chartered Accountants of India containing the information sought as furnished by Bidder on- line. Please ensure validity of UDIN for the entire bidding period.
3	**Permanent Account Number** The bidder should possess a Permanent Account Number (PAN) issued by Income Tax Department, Govt. of India.		Scanned copy of the PAN CARD.
4	**Goods and Service Tax (Not Applicable for Exempted Goods / Services)** The bidder should be either a. GST Registered Bidder under Regular Scheme (or) b. GST Registered Bidder under Composition Scheme (or) c. GST unregistered bidder		Scanned copy of the a. GST Registration Certificate (i.e. GST identification Number) issued by appropriate authority of India (or) b. GST Registration Certificate under composition scheme (i.e. GST identification Number) issued by appropriate authority of India.

Sl	Eligibility Criteria	Information to be furnished by the Bidder	Scanned copy of documents, to be uploaded by in support of information/ declaration furnished online by the Bidder against Eligibility Criteria as Confirmatory Document
			(or) c. A Certificate from a practicing Chartered Accountant having membership number with Institute of Chartered Accountants of India certifying that the bidder is GST unregistered bidder/ dealer in compliance with the relevant GST rules of India **Note:** If turnover of bidder exceeds exemption/threshold limit, the bidder must have GST registration as per GST Act and rules
5	**Legal Status of the Bidder** Bidders must be an individual, proprietorship firm, partnership firm, company registered under company's act.		Any one of the following documents: 1. Affidavit or any other document to prove proprietorship/individual status of the bidder. 2. Partnership deed containing name of partners. 3. Memorandum & Article of Association with certificate of incorporation containing name of bidder. 4. JV agreement having valid UDIN.
6	**Non-Banning** The bidders would give a declaration that they have not been banned or delisted by any Govt. or Quasi Govt. agencies or PSUs. If a bidder has been banned or delisted by any Govt. or Quasi Govt. agencies or PSUs, this fact must be clearly stated and it may not necessarily be a cause for disqualification. If the declaration is not given, the bid will be rejected as non-responsive.		Undertaking on Bidder's letter head mentioning the following (as applicable) I/ We have not been banned or delisted by any Govt., or Quasi Govt. Agencies or PSUs (or) I / We ……..have been banned by the organization named "…… " for a period of…… year/s, effective from …….. to……..….

Sl	Eligibility Criteria	Information to be furnished by the Bidder	Scanned copy of documents, to be uploaded by in support of information/ declaration furnished online by the Bidder against Eligibility Criteria as Confirmatory Document
7	Undertaking		An undertaking on the bidder's Letter Head regarding genuineness of the information furnished by him on-line and authenticity of the scanned copy of documents uploaded by him on-line in support of his eligibility, as per the provided format.
8	MII Compliance		Self-Certification on Bidders Letter Head mentioning the following: We certify that the works/services offered by us against the .....(Name of work) with GeM Bid No..... dated ..... meet the minimum local content requirement and has local content: * Equal to or more than 50% (Select this, in case of Class-I Local Suppliers) i.e.....% (indicating the percentage of local content) * More than 20% but less than 50% (Select this, in case of Class-II Local Suppliers) i.e .....%.(indicating the percentage of local content) ***Delete whichever is not applicable.**
9	Cybersecurity		Furnish nationally acceptable cybersecurity compliance certificate viz. ISO 27001 or CMMI Level 3 or above or equivalent.
10	VAPT		1. VAPT report or certificate of the test conducted in any of the work experiences submitted at Sl. No. – 01. 2. Letter of support or collaboration of any active CERT-In empaneled agency for conducting VAPT.

Sl	Eligibility Criteria	Information to be furnished by the Bidder	Scanned copy of documents, to be uploaded by in support of information/ declaration furnished online by the Bidder against Eligibility Criteria as Confirmatory Document
11	Dashboard Link		Furnish dashboard link of the integration performed in previous claimed work as per Sl. No. – 01 above. Provide login/IDs/Password and access should be open till conclusion of this tender. OR. Screenshots compiled in a pdf may be uploaded.
12	Integrity Pact		Format shall be provided.
13.	Letter of Bid		Format shall be provided.
14.	Proforma for undertaking to be uploaded by bidder/s (on their letterhead) regarding relatives as employees of company, arbitration clause (in case of partnership firm/jv/consortium), local supplier status of the bidder, cipp etc.		Format shall be provided.
15.	Local Content Certificate		Format shall be provided. UDIN shall be valid for the bid validity period.
16.	Proforma for declaration towards code of integrity for public procurement to be accepted unconditionally by bidders.		Format shall be provided.

2. Please note that extant government policies/guidelines regarding Startups and SMEs shall be followed.
3. Documents mentioned in Table – 4.2.1 above; are NOT required to be submitted with the RFQ response. These are only indicative and tentative, intended to provide preparatory instructions and time.
4. For tender participation (in case it is floated); please follow the tender documents ONLY. Hence, clarification related to Table – 4.2.1 of this annexure shall NOT be entertained.
5. Note that actual tender (if floated) shall have other documents like GTC (General Terms and Conditions), STC (Special Terms and Conditions), SLA (Service Level Agreements), etc., and/or any other documents as deemed necessary by MCL.