

Indian Highway Management Company Limited (IHMCL)

Invites sealed quotations for Supply of IT Equipment for
Toll Plazas on National Highways



Quotation No. IHMCL/HES/2017-01

Indian Highways Management Company Limited (IHMCL)

Sector-19, Dwarka, New Delhi-110075

4-Jul-17

Call for Quotation

IHMCL, a company promoted by NHAI, under the Companies Act, 1956, invites quotation in the sealed envelope by 15:00 hrs on 10.07.2017 physically or through post/currier at IHMCL office Sector-19, Dwarka, New Delhi-110075. From the authorized manufacturer/ Distributer for the IT equipments for Toll plazas on National Highways.

2. The quotation received after the 15:00 hrs on 10.07.2017 will be rejected.
3. The eligibility criteria of the authorized Manufacturer/ Distributer are elaborated in subsiding para graph.
4. Bidder shall be responsible for the supply of the equipment. They will give 1 year warranty of the equipment. The equipment having manufacturing defect will be replaced with the new once brought to the notice.
5. The equipment must be of industrial grade of the higher standards of the specification and workmanship. The details spec are described in the under mentioned para graph.
6. The Bill of quantity in enclosed in excel sheet as annexure-A and marked as "BOQ" the bidders are requested to fill their rates as per annexure-B in column number any tempering or modification in the lock filed of the BOQ will lead to disqualification.
7. The Quantities given in the BOQ are approximate and may vary as per the site requirement. IHMCL has write to increase or decrease quantity or reject the quotation without giving any justification to the bidder.

Document Composition

This Documents comprises for following parts.

Part-I	Instructions to Bidders
Part-II	Technical Specifications
Part-III	Payment Terms
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PART-I: INSTRUCTIONS TO BIDDERS

1. Bid Conditions

1.1 Eligibility to Bid

- A. The bidder shall be one of the following:
 - i. A company registered in India involved in the Supply, Installation, Testing, Commissioning & Maintenance of IT Systems/ Telecommunication system / Toll management systems including tag / OBU-based ETC.
 - ii. A company of foreign origin but with an office registered in India involved in the Supply, Installation, Testing, Commissioning & Maintenance of IT Systems/ Telecommunication system / Toll management systems including tag / OBU-based ETC.
 - iii. A consortium between a company registered in India involved in the Supply, Installation, Testing, Commissioning & Maintenance of IT Systems/ Telecommunication system / Toll management systems including tag / OBU-based ETC/ solution provider of local or foreign origin. The maximum number of consortium members shall be two.
- B. The bidder shall have at least three years of experience in Supply, Installation, Testing, Commissioning & Maintenance of IT Systems/ Telecommunication system / Toll management systems including tag / OBU-based ETC.
- C. The bidder should have an average annual turnover of Indian Rs 1 crores for the last three financial years (Note: For currencies other than Indian Rupees, the applicable conversion [selling] rate of the Reserve Bank of India on the last date of bid submission shall apply).

1.2 Scope of Work

The scope of work involves the following:

- A. Supply of IT equipment at Hybrid ETC Toll Plazas.
- B. Warranty of the above IT equipment should be for a period of 1 year after system commissioning.
- C. The equipment must be of industrial grade and shall be of the higher standards of the specification and workmanship.
- D. The successful bidder shall make his own arrangement for material storage.

1.3 Issuance of Purchase order:

- A. IHML reserves the right to give PO to the lowest bidder of the respective items. The quotation will not be accepted as a whole but PO for individual item may be given to the individual lowest bidder for that particular item.

- B. The entire supply should be completed within 45 days from the date of issuance of PO given by IHMCL or by its authorized representative.
- C. The time will be the essence of this quotation and the bidders must supply the equipments within the stipulated time. And delay in supply without any justified Reason/ Force majeure will attract Liquidated Damage from the bidder at the rate of 1% per day subject maximum up-to 10%.
- D. In case of default of the supplier the PO will be terminated.

1.4 Bill of Quantities: Please refer Annexure-A

List of Acronyms

(1)	ASB	Amber Siren Beacon
(2)	CCTV	Closed Circuit Television
(3)	NVR	Network Video Recorder
(4)	FSW	Emergency Footswitch
(5)	IHMCL	Indian Highway Management Company Limited
(6)	ISCU	Intercom Slave Communication Unit
(7)	MTBF	Mean Time Between Failures
(8)	MTTR	Mean Time to Repair
(9)	NHAI	National Highway Authority of India
(10)	PMS	Plaza Management System
(11)	PDB	Power Distribution Board
(12)	RAID	Redundant Array of Inexpensive Disks
(13)	RPR	Receipt Printer
(14)	FCD	Fee Collector Display
(15)	FCK	Fee Collector Keyboard
(16)	FCT	Fee Collector's Terminal

Part-II: Equipment Specifications

1. Toll Lane Equipment

The lane equipment shall be understood to be the equipment installed in the lanes at the Plazas.

Following lane Equipment shall be supplied under the scope of this document:

- (17) TFT Display
- (18) Customized keyboard
- (19) Thermal receipt printer
- (20) Barcode reader
- (21) Emergency footswitch (FSW) and Amber Siren Beacon (ASB)
- (22) Intercom slave communication unit (ISCU)
- (23) Booth Camera with voice recording

2. Plaza Level Equipment

The Plaza level equipment shall be understood to be the computer system installed in the Plaza building and shall consist of the following:

- (24) 55” LED Display for CCTV Monitoring
- (25) 24 Port Network switch (Layer 3)
- (26) Outdoor Wi-Fi access point (Managed & Rugged)
- (27) Network Video Recorder (NVR) for CCTV recording
- (28) CCTV cameras for Plaza building surveillance (server room, control room, cashup room, admin)
- (29) Intercom Master communication unit for Control Room

3. Technical Specification for Toll Lane Equipment

The technical specifications mentioned hereunder are minimum guidelines. The bidder shall not deviate materially from the minimum specifications specified.

...3.1.1 TFT Display

Minimum Technical specifications for the TFT display shall be as follows:

Descriptions	Remarks
Display Type	TFT with Diagonal Size of 18.5” Minimum
Cables	Power Cable 1 x VGA Cable (15- pin HD D – Sub)
Cable routes	Power cable: 15 meters VGA Cable: 15 meters (terminated to the SVGA Port at the LC via booth ducting)
Color	Manufacturer’s Original Color
Voltage Requirement	AC 230 V (50 / 60 Hz)
Power Consumption	80 W
Operating Temperature	08C to 508C
Relative Humidity	20 % to 80 %

Design Criteria	<ul style="list-style-type: none"> - Min. Resolution: 1024 X 768 / 60 Hz - Aspect Ratio : 4:3 - Number of Colors: 16.2 M, (6bit+FRC) - Video bandwidth: 70 MHz - Viewable size: 18.5” Minimum - MTBF: 30,000 hrs - MTTR: 0.25 hrs
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...3.1.2 Customized Keyboard

Customized Programmable Keyboard Features and minimum Specification shall be as follows:

- Shall have Powerful programming capability
- Programming under DOS and Windows, multiple page, multiple level, whole range key content, time delay, position sense answer back code, etc.
- True spill-resistant design
- Optional blank key, double key for alternative key group layout
- Optional MSR
- 70 programming keys + 6 position control key
- Key top size: 18 mm x 22 mm for single key
- Interface: PS/2 or USB
- Dimension: 340 mm (W) x 150 mm (D) x 58 mm (H) or vendor/OEM specific
- Weight: upto 1.2 kg
- Color: OEM Specific

...3.1.3 Barcode Reader (BCR)

Desktop mounted fixed Barcode reader for installation in the toll booth on the desktop in lanes.

The motorists upon reaching the pay-axis of the lane will produce the return/ daily pass ticket he had collected from the FC at the first entry lane. The FC will place the ticket on the barcode reader which will read the 2D barcode printed on the ticket.

Supplier shall note that handheld/handy barcode scanner/readers will not be allowed in any case, even if the same is provided with the stand. The scan rate of the handheld readers is very less which delays the transaction processing. The possibilities of damages in handheld barcode readers are very high. Hence only desktop mounted BCR shall be supplied.

BCR Features and minimum Specification shall be as follows:

- BCR shall be a High performance 2D omni directional laser scanner
- Shall have Programmable sleep mode; Reactivated by simple push of a button
- BCR shall perform Full automatic scanning operation
- Depth of Field: 300 mm (EAN 0.33 mm / 13 mil, PCS = 90%)
- Scan Patten: 7 directions of scan field, 24 scan lines
- Scan Rate: 2400 scans/sec for omni directional scanning
- Dimension: 152 mm (H) x 152 mm (W) x 91 mm (D); Weight: not more than 500 g
- Interface: USB or Serial

...3.1.4 Receipt Printer (RPR)

The thermal receipt printer (RPR) shall be used to print receipts in the lanes. The printer shall be provided with the automatic advance function of the paper after printing so that the space

for the first line of printing is aligned under the print head thus reducing the time taken to produce a receipt.

Minimum Technical specifications for the RPR shall be as follows:

Descriptions	Remarks
Dimension	Maximum up to 145mm (W) x 195mm (D) x 148 (H)
Weight	Shall be less than 2 kg
Installation and Fixing Details	Installed and fixed on the Fee Collector desk
Cables	- Power cable - Serial RS232C/ Parallel /USB
Cable routes	Power cable is terminated to the HLC Termination Block via booth ducting. Data cable is connected to the HLC
Color	Cool White/Dark Grey
Power Supply Requirement	24 VDC \pm 7%
Access for maintenance, modularity of construction	The cover can be opened for maintenance. It also has paper sensors. Off-the-shelf product
Operating Temperature	58C to 508C
Relative Humidity	5 % to 90 %
Design Criteria	Print Speed: 47 LPS Print font: 9x17/12x24 Print column capacity: 56/42 columns
	Character size (mm): 0.99(W) x 2.4 (H) / 1.41 (W) x 3.4 (H) Paper dimension (mm): 79.5 \pm 0.5 (W) x 83 (diameter) Paper thickness: 0.06-0.07 mm Auto cutter life: 1.5 million cuts Real-time printer status: Auto status back (ASB) messages MCBF: 52 million lines MTBF: 360,000 hours, Overall MTTR: 0.25 hrs

...3.2 Intercom Slave Communication Unit inside the booth (ISCU)

This specification lays down the general, functional and technical requirements of intercom slave communication unit to be used as a sub-system in the Booth at the Plaza.

ISCU shall be used for communication between the Toll Collector at the lane and the auditor/supervisor at the Plaza building.

ISCU shall have the following functions:

- (30) Voice communication installed in the booths shall provide hands free two-way verbal communication between the supervision staff in the control room and the Collectors. The Collector shall be able to attract the attention of the auditor in the control room by pressing a single button on the intercom slave unit in the booth.
- (31) The equipment shall also have the facility to allow the supervision staff to monitor communication in the booth between the Collector and the user or between any booth without alerting the Collector.
- (32) The voice communication system shall operate independently of the Plaza Toll management system.
- (33) Voice communication shall also be implemented in various rooms of the plaza building and at building access points.

- (34) Two-way communications shall be possible as soon as the auditor responds by selecting the appropriate lane button on the Master Communication unit
- (35) One-way communication shall be possible from the Control Room intercom to all lanes simultaneously (broadcast)

ISCU shall meet the following minimum technical specifications:

Descriptions	Remarks
Installation and Fixing Details	Fixed in the booth. (wall/desktop mount)
Speech Method	Hands-free
Wiring distance	120 meters with 0.202 mm diameter (33 AWG) cable, 300 meters with 1.024 mm diameter (18AWG) cable
Speaker	20 ohms
Power Consumption	6 W (max.)
Power Supply Requirement	Power supply from Master System
Wiring	2 wires, non-twisted
Environmental Considerations	Operating Temperature of 10°C to 50°C
Reliability	30,000 hrs

The Supplier may also propose/ provide an IP based intercom system.

...3.3 Panic Alarm System

This specification lays down the general, functional and technical requirements of panic alarm system to be used as a sub-system in the Plaza.

The Emergency Footswitch is located in each booth under the Collector’s desk. The footswitch is provided for use in case of emergency or accident. Pressing the footswitch causes an alarm to be given to the auditor via the Siren. The siren is fitted on the top of the booth.

...3.3.1 Minimum Technical Specifications for Footswitch

Descriptions	Remarks
Installation and Fixing Details	Mounted on the floor inside the tollbooth under the desktop
Cables	- Power cable - Signal cable
Cable routes	- The power cable is laid inside the booth manhole before terminating to the Controller Termination Block. - Data cable is connected to the Controller DI board from the termination block
Material and finishes	Steel
Color	Manufacturer’s Original Color
Power Supply Requirement	220~240 V AC 50-60Hz with 10 A
Access for maintenance, modularity of construction	Modular Design, only plug and replace when failed
Environmental Considerations	Operating Temperature 0 - 50°C
Reliability and maintainability	MCBF: 100,000 operations MTTR: 0.5 hrs

...3.3.2 Minimum Technical Specifications for Siren Beacon

Descriptions	Remarks
Technology	Motor Driven or better
Audible rating	112 dB at 1 meter
Environmental	Designed to meet IP54

4. Specification for Plaza Equipment

...4.1 Master Communication Unit (MCU)

This specification lays down the general, functional and technical requirements of master communication unit to be used as a sub-system in the Plaza.

The master communication unit MCU is a master communication system to control communication between the Collector at the lane and the auditor at the Plaza building. The unit will be located in the Control room and controlled by auditor/ supervisor.

Technical Specifications:

Descriptions	Remarks
Power Source	24V DC
Current Consumption	Max. 1A, 80mA in standby
Communication	Push-to-talk at master station hands free at sub
Calling	LED and intermittent ringing tone at master until answered
Frequency Response	770 – 6800Hz
Total Harmonic Distortion	3% @ 1000Hz at 20 ohms
Mounting	Wall or desk mount
Wiring	2 conductor per sub station
MTBF	30,000 hrs

5. Specifications for Closed Circuit Television (CCTV)

...5.1 General

This part of the RFP covers the equipment and services to be supplied under CCTV equipment to be installed at the Plazas. The CCTV equipment shall be categorized as two types, CCTV for lanes and CCTV for Plaza surveillance.

The CCTV for lanes shall be:

- (36) Booth CCTV cameras

The CCTV for Plaza surveillance are:

- (37) Network Video Recorder (NVR)
- (38) Video Management Software (VMS)
- (39) Plaza Building Security CCTV cameras

All the cameras shall be IP based and shall be connected to the Plaza Network video recorder (NVR). The video management software (VMS) installed on NVR shall provide the facility to control the cameras at the Supervision Control room at the Plaza Buildings. The video recording of each camera shall be stored at for a period of minimum 30 days.

The functionality of the CCTV cameras provided by the Bidder shall be described as follows:

Booth CCTV cameras – These cameras shall be installed inside of the booth to capture the activities of the Collector all the time and especially when doing the transactions along with the view of the paying vehicle. The position of the booth camera shall be decided accordingly. These cameras shall have inbuilt voice recording and SD memory card of minimum 32GB for local storage of videos and voice recordings.

Plaza Building Security CCTV cameras – These cameras shall be intended for monitoring of security areas such as the plaza compound, general parking area, Toll Control Room, cash

room, plaza building lobby, Collector walkway, server room, UPS room, tunnel, parking, staircase, cash van loading area, etc.

The design of the CCTV system for the plaza shall consider the following: -

- (40) Provide effective supervision and control
- (41) Easy to use
- (42) Self-contained system
- (43) Increase span of management
- (44) Reduce unnecessary travel
- (45) View / evaluate situations quickly
- (46) Motion detection
- (47) Savings on time and manpower
- (48) Easy access to video information and quick playback
- (49) Minimize the use of security guards
- (50) Eliminate unnecessary responses to false alarms
- (51) Provision for future scalability

...5.2 Requirements for the Booth CCTV cameras

The booth CCTV camera shall be a IP based fixed dome type color cameras installed inside the booth to capture the activities of the Fee Collector while performing his operations. The camera also shall capture the view of the paying vehicle while capturing the transaction video.

These cameras shall have inbuilt voice recording and SD memory card of minimum 32GB for local storage of videos and voice recordings.

These cameras shall be connected to the NVR installed at the control/server room at each Plaza building.

The camera and NVMS shall be capable of triggering alarms in case of Video motion detection, manual trigger, digital input, periodical trigger, system boot, recording notification, camera tampering detection and audio detection. The triggering alerts can be controlled by the control room operator.

Technical Specifications of the Booth Cameras shall be as follows:

The technical specifications mentioned hereunder are minimum guidelines. The Bidder shall not deviate materially from the specifications specified herein.

Descriptions	Remarks
Image Sensor	1/2.8" Progressive CMOS
Maximum Resolution	1920x1080 (2MP)
Lens Type	Fixed Focal
Focal Length	f = 2.8
Aperture	F1.8
Field of View	110° (Horizontal), 64° (Vertical), 135° (Diagonal)
Shutter Time	1/5 sec. to 1/30,000 sec.
Day/Night	Removable IR-cut filter for day & night function
Minimum Illumination	0.08 Lux @ F1.8 (Color) 0.001 Lux @ F1.8 (B/W)

IR Illuminators	Built-in IR illuminators, effective up to 25 meters or better IR LED*8
On-board Storage	SD/SDHC/SDXC card slot
Compression	H.265 & MJPEG
Maximum Frame Rate	30 fps @ 1920x1080 In both compression modes
Maximum Streams	4 simultaneous streams
S/N Ratio	Above 55dB
Dynamic Range	97dB or better
Video Streaming	Adjustable resolution, quality and bitrate
Image Settings	Adjustable image size, quality and bit rate, Time stamp, text overlay, flip & mirror, Configurable brightness, contrast, saturation, sharpness, white balance, exposure control, gain, backlight compensation, privacy masks, Scheduled profile settings, Seamless recording, smart stream, 3D Noise Reduction, Video Rotation
Audio Capability	Audio input /output (full duplex)
Compression	G.711, G.726
Interface	External microphone input Audio output
Protocols	IPv4, IPv6, TCP/IP, HTTP, HTTPS, UPnP, RTSP/RTP/RTCP, IGMP, SMTP, FTP, DHCP, NTP, DNS, DDNS, PPPoE, CoS, QoS, SNMP, 802.1X, UDP, ICMP
Interface	10 Base-T/100 BaseTX Ethernet (RJ-45)
ONVIF	Supported
Alarm Triggers	Video motion detection, manual trigger, digital input, periodical trigger, system boot, recording notification, camera tampering detection, audio detection
Alarm Events	Event notification using digital output, HTTP, SMTP, FTP and NAS server, SD Card File upload via HTTP, SMTP, FTP, NAS server and SD card
Connectors	RJ-45 for Network/PoE connection Audio output DC 12V power input Digital input : 1, Digital output : 1
LED Indicator	System power and status indicator
Power Input	Max. 9 W (PoE)
Safety Certifications	CE, LVD, FCC Class B, VCCI, C-Tick
Operating Temperature	Temperature: -10°C to 50°C

...5.3 Requirements for Network Video Recorder (NVR)

H.265 Linux-based embedded standalone NVR shall be provided. Shall support 16-Channel /24-Channel / 32-Channel network cameras. The NVR shall be ONVIF compliant and scalable configuration with features to help users to set up and manage advanced IP surveillance systems with ease. The NVR shall also support remote and mobile access, via web based application, and app for both iOS and Android devices.

The NVR shall have minimum following technical features:

- a) H.265 Compression Technology
- b) Plug & Play One Button Auto Setup

- c) Intuitive, Intelligent and Interactive UI
- d) Live viewing, recording and Playback features
- e) Embedded Linux OS or OEM Specific
- f) Support RAID 0/1/5 Storage
- g) Up to 12MP Camera Liveview & Playback
- h) Dual Lan Network Ports with Failover Function
- i) ONVIF Open Platform

...5.4 Requirements for the building security cameras

The system shall be connected to the NVR. The VMS installed on NVR shall provide the facility to control the cameras at the Supervision Control room at the Plaza Buildings.

The cameras shall be for monitoring of security areas such as plaza compound, security garage, Control Room, Change of Shift Room and Cash Counting Room, Lobby, Hallway, Tunnel, Fee Collector Walkway, parking, staircase, DG room, electrical room, server room, UPS room, Loading Bay, etc.

These cameras shall be

- a) Fixed lens Bullet CCTV night vision colour cameras.

The bullet cameras installed outdoor shall be installed in the weather proof enclosure.

Technical Specifications of the Plaza Surveillance Cameras shall be as stated hereunder. The technical specifications mentioned hereunder are minimum guidelines. The Bidder shall not deviate materially from the specification specified while preparing the Technical Proposal of the Tender.

...5.4.1 Fixed lens Bullet CCTV night vision color cameras

Description	Remarks
Image Sensor	1/2.8" Progressive CMOS
Maximum Resolution	1920x1080 (2MP)
Lens Type	Fixed-focal
Focal Length	f = 3.6 mm
Aperture	F2.1
Field of View	83° (Horizontal), 53° (Vertical), 91° (Diagonal)
Shutter Time	1/5 sec. to 1/30,000 sec. or better
Day/Night	Removable IR-cut filter for day & night function
Minimum Illumination	0.06 Lux @ F2.1 (Color)
	0.001 Lux @ F2.1 (B/W)
IR Illuminators	Built-in IR illuminators, effective up to 30 meters
On-board Storage	Slot type: SD/SDHC/SDXC card slot
	Seamless Recording
Compression	H.265 & MJPEG
Maximum Frame Rate	30 fps @ 1920x1080
	In both compression modes
Maximum Streams	4 simultaneous streams
S/N Ratio	50 dB or better

Dynamic Range	95 dB or better
Video Streaming	Adjustable resolution, quality and bitrate, Stream
Image Settings	Adjustable image size, quality and bit rate, Time stamp, text overlay, flip & mirror, Configurable brightness, contrast, saturation, sharpness, white balance, exposure control, gain, backlight compensation, privacy masks, Scheduled profile settings, 3D Noise Reduction, Video Rotation, Defog
Audio Capability	Two-way audio (full duplex)
Compression	G.711, G.726
Interface	External microphone input
	Audio output
Users	Live viewing for up to 10 clients
Protocols	IPv4, IPv6, TCP/IP, HTTP, HTTPS, UPnP, RTSP/RTP/RTCP, IGMP, SMTP, FTP, DHCP, NTP, DNS, DDNS, PPPoE, CoS, QoS, SNMP, 802.1X, UDP, ICMP, ARP, SSL, TLS
Interface	10 Base-T/100 BaseTX Ethernet (RJ-45)
ONVIF	Supported
VCA	Line crossing detection, field detection, loitering detection
Alarm Triggers	Video motion detection, manual trigger, digital input, periodical trigger, system boot, recording notification, camera tampering detection, audio detection
Alarm Events	Event notification using digital output, HTTP, SMTP, FTP and NAS server, SD Card
	File upload via HTTP, SMTP, FTP, NAS server and SD card
Smart Focus System	Fixed Focus
Connectors	RJ-45 cable connector for Network/PoE connection
	Audio input
	Audio output
	DC 12V power input
	Digital input: 1, Digital output:1
LED Indicator	System power and status indicator
Power Input	DC 12V
	IEEE 802.3af/at PoE Class 0
Power Consumption	Max. 9 W
Casing	Weather-proof IP66-rated housing
	Vandal-proof IK10-rated metal housing (Casing Only)
Safety Certifications	CE, LVD, FCC Class A, VCCI, C-Tick
Operating Temperature	10°C to 50°C

6. Network Equipment

7. Functional Requirement for Switches

- a. Switch should support port security, DHCP snooping, Dynamic ARP inspection, IP Source guard, BPDU Guard, spanning tree root guard.
- b. Switch should be IPv6 Certified/IPv6 logo ready and Switch / Switch's Operating System should be tested and certified or in process of certification for EAL 2/NDPP or above under Common Criteria Certification.

- c. Switch should have 1:1 redundant internal power supply. Power supply modules, fan modules and transceivers modules should be hot swappable.
- d. Should support IEEE Standards of Ethernet: IEEE 802.1D, 802.1s, 802.1w, 802.1x, 802.3ad, 802.3x, 802.1p, 802.1Q, 802.3, 802.3u, 802.3ab, 802.3z, 802.3az.

...7.1.1 8-Port PoE Industrial grade rugged Switch with 2 Fibre Port at Toll Plaza

This device shall have the capability to provide adequate continuous power to each of the CCTV cameras and associated equipment (e.g. video analytics module, PTZ mechanism) to meet the required performance, quality and reliability requirements.

- a. Switch shall have minimum 8 nos. 10/100Base-T (with minimum 6 PoE ports with power budget of 60W) ports and additional 2 numbers of SFP uplink ports loaded with MMF Modules.
- b. Shall have be IP30 rated and shall work on up to 60°C temp in a sealed enclosure and should be DIN Rail mountable.
- c. Switch shall be IEC 60068-2-6, IEC 60068-2-27, IEC 60068-2-47, IEC 60068-2-64, IEC 61000-4-5 and NEMA TS-2 compliant.

8. 24 Port Switch with 4 Fibre Port

- a. Switch shall have minimum 24 nos. 10/100/1000 Base-T ports and additional 4 nos. SFP uplink ports loaded with MMF modules with dedicated stacking ports
- b. Switch shall have wire rate performance and 48 Gbps of dedicated stacking bandwidth.

9. Industrial Grade outdoor rugged WiFi Access Point

- c. Wall/Ceiling/Poll mounted Wi-fi access-point suitable for outdoor use with at least 1 10/100/1000Mbps Ethernet ports supporting standard 802.3af/at POE+. Should have additional SFP port for direct fiber termination if required.
- d. 802.11ac AP should operate in 2.4 GHz (450 Mbps or more) and 5 GHz simultaneously and capable of minimum 860 Mbps on 5 Ghz for 802.11ac clients supporting minimum 2x2 MIMO with 2 spatial streams. It must support minimum 2 concurrent MU-MIMO users.
- e. Should support minimum 16x BSSID per AP. Should have Operating Temperature of 0-55 Deg Centigrade
- f. The access point should be capable of performing security scanning and serving clients on the same radio. It should be also capable of performing RF analysis and security scanning using same radio.
- g. Must support minimum 27dbm of transmit power in both 2.4Ghz and 5Ghz radios with the support of both Omni and directional (min 120degree) external antenna options.
- h. AP should support band steering and load balance across bands and AP's.
- i. Security mechanisms should be in place to protect the communication between the Access Point controller and the Access Points.
- j. The access point should support WPA2 enterprise authentication and AES/CCMP encryption.
- k. AP should support 802.11k for Radios Resource management and 802.11r for fast roaming.

- l. Implement Wi-Fi alliance standards WMM, 802.11d, 802.11h and 802.11e and should support VoWLAN
- m. AP must support L7 Application Identification and spectrum analysis functions
- n. AP should support Minimum -90dB Receiving sensitivity. AP should support Receiver sensitivity Threshold to reduce noise reception in the AP to increase SNR and performance
- o. 802.11 a/b/g/n/ac wave 2 functionality certified by the Wi-Fi alliance, Should be IP67 rated and RF transmission power should be approved by WPC.
- p. AP should support up to 100-mph sustained winds and up to 165-mph wind gusts

10. Industrial Grade 55” Display for CCTV Monitoring

The Display shall be a 55” inch professional grade display with wide viewing angle, full HD resolution and shall be suitable for 24x7 indoor application. The monitor shall have high contrast ratio, lightweight design, full high definition 1920x1080 resolution, and anti-glare panel. It shall have inbuilt VGA, DVI, S-Video and HDMI ports for multiple video inputs.

No.	Item	Specification
1.	Panel Size	55 inch
2.	Light source	LED Backlight
3.	Resolution	1920 X 1080 pixels
4.	Dynamic Contrast Ratio	1400:1
5.	Viewing angle	Horizontal: 178 Degree, Vertical: 178 Degree
6.	Display feature	Full HD; Panel
7.	Response time	Minimum 8ms
8.	Lifetime	Minimum 50,000 Hrs.
9.	Colours	Minimum 16 Million
10.	Brightness	350cd/m ²
11.	Panel thickness	Not more than 65mm

Part – III Payment terms

1. Supply, installation, System Integration, Testing & Commissioning
 - A. 40 % of the system value against supply of all equipments.
 - B. 40 % after successful installation and integration with ETC system.
 - C. 20% on successful system testing and commissioning.

Disclaimer

The information contained in this document or subsequently provided to Bidder(s), whether verbally or in documentary or any other form by or on behalf of IHMCL or any of its employees or advisors, is provided to Bidder(s) on the terms and conditions set out in this document and such other terms and conditions subject to which such information is provided.

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

Annexure- A

BOQ (Bill of Quantity)			
Sr. No.	Item/Description	Unit	Quantity per lane
I - Lane Level Equipment - Hybrid ETC Lanes			
1	TFT Monitor	No	301
2	Customized industrial grade keyboard	No	301
3	Thermal Receipt Printer	No	301
4	Barcode Reader with stand	No	301
5	Violation light & Alarm (on existing pole) and Foot switch in booth	No	301
6	Booth CCTV camera with voice recording	No	301
7	Intercom Slave unit in booth	No	301
II - Plaza Level Equipment - To be installed post verification			
8	24 Port Network switch (Layer 3)	No	62
9	Outdoor Wifi access point (Managed & Rugged)	No	93
10	55" LED Display for CCTV Monitoring	No	31
11	Network Video Recorder (NVR) for CCTV recording	No	31
12	CCTV cameras for Plaza building surveillance (server room, control room, cash-up room, admin)	No	124
13	10-channel Intercom Master Unit in Control Room	No	22
14	20-channel Intercom Master Unit in Control Room	No	9

Annexure-B Format for Financial Bid Submission

(For sample only, actual Format to be downloaded from e-tender portal for on-line submission)

Sub.: Quotations for supply of IT Equipment for Toll Plazas on National Highways

Ref: IHMCL/HES/2017-01 dated 03/7/2017 on above subject.

Dear Sir,

I/We, the undersigned having examined the above referred RFQ including addendums thereof and, hereby offer to submit our bid to undertake the subject assignment with total bid value as per milestone and break-up furnished below.

BREAK-UP OF RATES

Sr. No.	Item/Description	Unit	Quantity per lane	Unit Rate (Rs.)	Amount (Rs.)
1	TFT Monitor	No	301		
2	Customized industrial grade keyboard	No	301		
3	Thermal Receipt Printer	No	301		
4	Barcode Reader with stand	No	301		
5	Violation light & Alarm (on existing pole) and Foot switch in booth	No	301		
6	Booth CCTV camera with voice recording	No	301		
7	Intercom Slave unit in booth	No	301		
8	24 Port Network switch (Layer 3)	No	62		
9	Outdoor Wi-Fi access point (Managed & Rugged)	No	93		
10	55" LED Display for CCTV Monitoring	No	31		
11	Network Video Recorder (NVR) for CCTV recording	No	31		
12	CCTV cameras for Plaza building surveillance (server room, control room, cash-up room, admin)	No	124		
13	10-channel Intercom Master Unit in Control Room	No	22		
14	20-channel Intercom Master Unit in Control Room	No	9		
Total Bid Price					

1. I/We do hereby confirm that my/ our bid price include all statutory taxes/ levies /GST (as applicable). I/ We also declare that any tax, surcharge on tax and / or any other levies, if altered in future and payable under the law, the same shall be borne by me/ us.
2. This bid is **valid** for a period of **120 calendar days** from the bid due date.
3. I/ We, understand that the
 - (a) Applicable GST shall be released by IHMCL at the time of releasing the payment.
 - (b) TDS will be deducted against payments as per Applicable Law.
 - (c) In case of any difference in figures and words, the amount mentioned in words will prevail.

Yours sincerely,

Name

Designation/ Title of the Authorized Signatory