Date: 29.11.2019

Response to queries in reference to GeM bid number: GEM/2019/B/427140 dated 17.11.2019 and ATC document dated 17.11.2019 (High speed connectivity using RF in Punjab)

SN	Parameter	Clarification / Response to Query
1.	Tx Power	Transmission range is directly proportional to transmission power. As per GSR 1048E the EIRP is allowed upto 53 dBm, hence a higher Tx Power and Antenna Gain is very important for any permutation and combination in future to establish link with stable link budget. However, the importance of a high-power radio and a low power radio and its technical significance will be tested and evaluated in the field POC. "Tx Power" is not a restriction for participation but technical qualification, based upon the requirement of the performance. Therefore, concerns regarding this parameter shall be taken into consideration during technical evaluation provided the performance of the solution does not affect the requirement of the tender and project.
2.	Number of CPEs per BTS sector	The Base Station sector shall register minimum 100 CPEs with it and considering the standard contention ratio, all CPEs will not be using 50 Mbps all the time; hence the requirement 100 CPEs per BTS. This will also help the bidders to participate with capacious BTS equipment which in turn could save the cost of BTS and also to save the cost of infrastructure (tower space, rack space, electricity, switches, and cables along with cost of management).
3.	Network Management System	With reference to the Clause No. 1.51 of the ATC document, a Network Management System is required to monitor the entire network that is scalable to 10,000 elements starting 3500 elements initially. The cost of such solution shall be included in the cost of the quoted solution. The NMS should be from the same OEM.
4.	CPE Antenna	CPE should be equipped with Integrated Antenna to avoid the space and mounting challenges on wall and rooftop of leased Government premises with limited access of building and space. The integrated antennas are directly attached with CPE's main-board and it reduces the losses of cables and connector

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		which helps for a stable link budget for longer distance. Also, the antennas play major role in link budget and the same cannot be compensated by transmit power alone. A better fade margin is preferred for all the links located at the edge of 5 Km distance. Any 16 dBi / 20 dBi / 22 dBi Antenna (in contrast to 24dBi antenna) may establish the link over 5 Km with a very low margin but may affect the performance due to bad weather and possible interference due to lack of stability of the link. A 24dBi antenna will ensure stability along with mere connectivity, thus conforming to the requirement of this long term project.
5.	OEM Make Antenna	OEM make Antenna is required to avoid 3rd party antennas with no endorsement of quality, performance and life cycle. Any part of the solution that may have probable ownership issues in future are being avoided in the tender. In the event of any mismatch of specifications (w.r.t. antenna) and the OEM offerings, bidders should ensure to provide the next higher configuration available with their OEM.
6.	Configurable uplink / downlink throughput % of total product capacity	The TDD / TDMA supports symmetric and asymmetric transmission; hence, the radio must support the TDD / TDMA functionality as per the specifications mentioned in the ATC document. Also, 90% or higher traffic management in any direction is very important in this project to address video uplinks and field level access to SDC (State Data Center). This paramter is not a restriction for participation but technical qualification, based upon the requirement of the performance. Therefore, concerns regarding this parameter shall be taken into consideration during technical evaluation provided the performance of the solution does not affect the requirement of the tender and project.
7.	MTU Size	For better performance of network, MTU size of more than equal to 2048 bytes is recommended for video and surveillance traffic, hence MTU size of 2100 bytes is mentioned in the tender. An MTU size of 2304 bytes is also set as a standard by IEEE for wireless networks in comparison to an MTU size of 1500 bytes meant for wired Ethernet network. Refer corrigendum.
8.	SNMP Version	All SNMP versions shall be supported for the necessity of compatibility with third party NMS along with

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		the backward compatibilities. This is to ensure compatibility of all MIBs (Management Information Base) with all versions of SNMP to ensure manageability across networks in the state.
9.	Power Consumption	The tender requires low power consumption solution for the said scalable deployment which may be required to be switched over to a solar power source in future, especially in the rural areas. This requirement is also in line with the cost of energy and its backup along with the environmental factors. However, the parameter is not a restriction for participation but preference w.r.t the total cost of ownership of the network for the state. Therefore, concerns regarding this parameter shall be taken into consideration during technical evaluation provided the performance of the solution does not affect the requirement of the tender and project.
10.	Management	The radio management shall be supported by both Telnet and Web Interface. Telnet in particular is required many times when a radio is deployed behind a router and is directly not accessible.
11.	Tower Certification	The design of any good tower will accommodate inputs from the OEM or details of the equipment that is to be installed on it. Bidders might neglect the important correlation of the load and aerodynamics of hardware (i.e. equipment, antenna etc.) and the load bearing and / or wind withstanding capacity of the tower; hence the certification is required. In addition to the approval from the accrediting agency, OEM endorsement is a must to avoid any design gap which may lead to rework during the project that affects project timelines and budget as well.
12.	OFDM Modulation	All standard OFDM modulations in the tender specifications are to be complied for technical qualification. BPSK and QPSK, being the strongest modulation for NLOS scenarios, are the key to the project requirement particularly for establishing long distance links. Moreover any subset of standard OFDM modulation is not intended to be compromised.
13.	TDMA support in BTS	TDMA support in BTS is an essential feature for any carrier grade PTMP equipment. It is a standard requirement to maintain a quality network. A non - carrier grade BTS or CPE with TDD + CSMA or CSMA alone or both is not acceptable.

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14.	VLAN Management	Multiple VLAN IDs needs to be carried out by PTP & PTMP links from PAWAN PoP to Sub division office and further to blocks and villages. Since all VLANs will be hosted in core PAWAN router at District HQ and these VLANs have to be propagated to all connected government sites, the RF links in between must support comprehensive VLAN propagation (trunking, pass through, transparent, Q in Q [double tagging]