

A number of actionable points emerged from these reports. Some of the important points which became the part of policy/ standard are:

1. Based on TEC Technical Report, 13 digit M2M Numbering plan for SIM based devices/ Gateways which will co-exist with existing 10-digit numbering scheme being used for mobile phones was prepared in TEC and recommended for approval
 - DoT approved this scheme in Dec 2016 and issued orders to all the TSPs for implementation.
Five codes of 3 digits each (559, 575, 576, 579 and 597) have been allotted as a M2M identifier.
2. M2M SIM/ Embedded SIM & remote subscription management: - In view of technical report released on this subject, Interface Requirement (IR) was prepared in TEC.
 - DoT has approved the use of Embedded SIM with OTA provisioning.
 - Ministry of Road Transport and Highways in India has issued a Standard [AIS-140] which mandates the use of Embedded SIM for Commercial Passenger Vehicle Tracking.
 - The Bureau of Indian Standards (BIS) has released a new Standard for Automotive Tracking Device and Integrated Systems (IS16833: 2018) which mandates the use of the embedded SIM as per the Standards/Specifications of TEC, DoT.
3. Any device / Gateway having direct connectivity with PSTN / PLMN should have static IP (IPv6 or IPv4). As IPv4 addresses are going to exhaust, early adoption of IPv6 at device, network and application level will be necessary.
Bureau of Indian Standards (BIS) in its standard IS16444 has mandated IPv6 for Smart meters to be connected on Cellular technologies.
4. Multi-protocol gateways: Important for Smart homes/ building solutions. Essential requirement has already been prepared under MTCTE.
5. Common Service layer at the platform for sharing of data across verticals and across platforms.
6. Spectrum for low power wireless communication technologies
 - Based on Technical Report, additional Spectrum of 12MHz for Low power RF communication technologies in Sub GHz band, adjacent to existing delicensed spectrum (865-867 MHz) was recommended to reserve and release as per requirement.
 - DoT referred the case to TRAI.
 - TRAI had recommended 7 MHz spectrum [1 MHz of spectrum in 867- 868 MHz and 6 MHz in 915-935 MHz band] to be delicensed on priority, in its recommendation on "Spectrum, Roaming and QoS related requirements in Machine-to-Machine (M2M) Communications" released in Sept. 2017.
 - DoT approved the TRAI recommendations. This delicensed spectrum is expected to be released by WPC in the NFAP.
7. **Spectrum requirement in 5.9 GHz for DSRC technology:** - As per recommendation of TEC TR on "V2V/ V2I Radio Communication and Embedded SIM", related to the study of DSRC

technology for V2V applications in Intelligent Transport System, 5.9 GHz spectrum was recommended. Dedicated Short Range Communication (DSRC) technology, working in 5.9 GHz band, has been deployed in USA, Canada, Europe, Singapore and Australia for Vehicle to Vehicle (V2V) applications.

3GPP in its Release 14 (and beyond) has provided specifications for C-V2X technology [here X refers to Vehicle (V), Infrastructure (I), People (P) and Network (N)]. It is having basic safety features (V2V) from DSRC/ 3GPP. It will also work on 5.9 GHz band; therefore, this frequency band may also be used in implementation of C-V2X technology for Intelligent Transport System.

8. **Licensing/ Registration for non-cellular LPWAN technologies (such as LoRa, Sigfox etc.) service providers:** - It is important from the policy as well as security perspective to have the details of agencies providing public services. This may be the part of M2M Service provider registration policy, expected in near future.