Annexure A

Idea Cellular Response
To
TRAI Consultation Paper
On
Spectrum, Roaming and QoS related requirements in Machine-to-Machine (M2M) Communications

Dated Oct 18, 2016

Preamble:

Idea Cellular welcomes the opportunity to contribute to the above-cited consultation.

At the outset, it is submitted that the Authority has rightly pointed out in its Consultation Document that, "*M2M communication has potential to bring substantial social and economic benefits to governments, citizens, end-users and businesses through increase in productivity and competitiveness, improvements in service delivery, optimal use of scarce resources as well as creation of new jobs*"

Against that background, Idea Cellular would thus like to thank the Authority for its interest in addressing the pertinent issues of spectrum, roaming and QoS in respect of M2M services**,** since that recognizes its commitment towards stimulation of M2M services for benefit of the country and for providing efficient centric services to its citizens.

It is common knowledge that the M2M ecosystem is composed of a large number of diverse players, deploying innovative services across different networks, technologies and devices. The Authority has rightly pointed out in the Consultation Paper that the M2M Industry is still at a nascent stage. In view of the same, Idea Cellular would like to submit that Regulatory flexibility on various key fronts has to be available to all stakeholders – Telecom service providers, content and application providers - to ensure massive uptake and usage of M2M services.

Cellular Operators, through their investments, robust network roll-outs and tariffing innovations have been important pillars of telecom growth journey and hence the Authority needs to ensure that these strengths are fully leveraged to attain M2M services growth.

We would also like to submit that under the current licensing regime, all the services which require an access to Public Networks as mentioned above such as Cellular Mobile or Fixed-line Networks or Public

Internet are to be provided by Licensed Service providers holding UASL / Unified License (Access Services) only i.e. Licensed TSPs {(UASL/UL (AS)} or Licensed VNOs (with access services authorization).

Therefore, Machine-to-Machine communication which involves the use of Public Networks like Cellular Mobile should be allowed to be provided only by Licensed Service Providers as the basic premise that access to public networks should be enabled by Licensed Entities remains the same whether it is P2P communication or M2M communication.

We thus submit that there is no need for any amendment to current Licensing structure for M2M Services and that any entities such as System Integrators who have created local networks or platforms and require access to Public networks for enabling end to end M2M services to the masses or end consumers on a commercial scale should necessarily obtain a UL (Access Authorization) or a UL (VNO) to be able to sell M2M services.

Needless to say, the said entity needs to also comply with the Licensing terms and conditions including quality of service, payment of license fee / spectrum usage charges / other levies, customer life-cycle management, security, usage data storage & retrieval, lawful interception, etc.

Further, it is submitted that that M2M Services should not be allowed to be offered under a Registration as it will lead to creation of a regulatory and revenue arbitrage between UASL / UL(AS)/ UL(VNO) and M2MSP for offering same services. The M2MSP under a Registration will have a regulatory and commercial advantage over telecom service providers who would be subjected not only to a complex licensing / regulatory framework that would make them liable and responsible for a plethora of licensing provisions and regulations such as QoS, Tariff Regulations, KYC, confidentiality of customer information, Regulatory Audits, Consumer Protection Regulations, emergency services, privacy of communication, lawful monitoring and interception, etc. but would also be subjected to various regulatory levies such as license fee, USO levy, SUC, etc on the revenue earned from these services. This will not only lead to a non-level playing field, but will also result in loss to the public exchequer. Hence, M2M services should not be allowed to be offered under a registration.

Here it is pertinent to mention that the TSPs understand the telecom ecosystem better than any other outside entities and have invested accordingly in sales & distribution efforts, marketing & promotions, customer service and spectrum to give users the best possible digital experience. They are also better

equipped to understand consumers and market dynamics and have the capability to translate robust M2M proliferation plans to reality.

It is also submitted that there is no need for any separate allocation of Spectrum for M2M Services. M2M Services can be continued to be provided over the licensed spectrum acquired by TSPs for the following reasons:

- Licensed spectrum is most suited to deliver the reliable, high quality M2M/IoT services. This is because Licensed Spectrum has a very low risk of facing interference and its usage can be calibrated to provide desired SLAs for M2M usage, even over wide areas.

- Licensed spectrum has coverage capabilities to support rapid M2M/IoT growth as cellular networks using licensed spectrum are able to provide seamless coverage across LSAs.

- The underlying network resources for both M2M and P2P communication are the same.

<u>In view of the above we would like to make following suggestions to the Authority:</u>

I. **M2M services that involve the use of Public Networks like Cellular Mobile should be allowed to be provided only by Licensed Service Providers i.e. Licensed TSPs {(UASL/UL (AS)} or Licensed VNOs.**

II. **There is thus no need for any amendment to current Licensing structure for M2M Services and any entities such as System Integrators who have created local networks or platforms and require access to Public networks for enabling end to end M2M services to the end consumers on a commercial scale should necessarily obtain a UL or a UL (VNO) to be able to sell M2M services.**

III. **It is also submitted that there is no need for any separate allocation of Spectrum for M2M Services. M2M Services can be continued to be provided over the licensed spectrum acquired by TSPs**

IV. **Further, any de-licensing of spectrum bands for the purpose of promoting M2M communications should not be carried out at present**

V. **We also believe that the tariff for M2M / IoT devices should be kept out of the purview of any roaming regulation.**

VI. **Adoption of roaming models in the context of M2M services needs to be driven by market forces for the best solutions to evolve in future and there should not be any mandate in this regard**.

VII. **Idea Cellular feels that there is a need to define different types of SLAs at point of interconnects at various layers of Heterogeneous Networks (HetNets).**

VIII. **Ideally QoS norms for M2M should be defined by any Standards Body for facilitating optimum network performance. However, at this present point in time, we are not in favor of any regulatory mandates.**

IX. **There is a need to simplify the existing KYC norms keeping in mind the M2M use case**

In view of the above, our submissions to the queries raised in the CP are as follows:

IDEA SUBMISSIONS ON ISSUES FOR CONSULTATION

Q1. What should be the framework for introduction of M2M Service providers in the sector? Should it be through amendment in the existing licenses of access service/ISP license and/or licensing authorization in the existing Unified License and UL (VNO) license or it should be kept under OSP Category registration? Please provide rationale to your response.

Idea Submission:

a. It is first submitted that under the current licensing regime, the M2M services in the country are already being provided by licensed service providers who have their own network that extends to provide last mile access. **It is further submitted that the TRAI is already aware that reselling of telegraph services is only permissible under the UL (VNO) framework, guidelines for which have**

already been notified by the DoT on 31st May 2016 based on the TRAI's Recommendations of 1st May 2015 on "Introducing Virtual Network Operators in Telecom Sector".

b. Further, under the Unified Licensing Regime, all the services which require an access to Public Networks as mentioned above such as Cellular Mobile or Fix-line Networks or Public Internet are to be provided by Licensed Service provider providers holding UASL / Unified Licence (Access Services)s providers holding UASL / Unified Licence (Access Services)only i.e. Licensed TSPs or Licensed VNOs. **Therefore, M2M services that involve the use of Public Networks like Cellular Mobile should be allowed to be provided only by Licensed Service Providers i.e. Licensed TSPs** {(UASL/UL (AS)} **or Licensed VNOs.**

c. The Authority has also correctly pointed out in its Consultation Paper that "*As per the OSP registration terms and conditions, Application Service Providers could take telecom resources from authorized TSPs only and may not infringe upon the jurisdiction of other authorized TSPs and they cannot provide switched telephony*" and that **"***Unlike Mobile to Mobile service providers, there are no issues of mobility, numbering, roaming and interoperability with the OSPs. Also many M2M services are supposed to be mission critical in nature in city operations*." Further, the Authority's observation on international experience that "*Internationally, MSPs are Mobile network Operators (MNOs) and Virtual Network Operators (VNOs) or Mobile Virtual Network Operators (MVNOs)*", is also a potent indication that no other arrangement such as Registration would be advisable because of the specific ICT infrastructure requirements of such an entity. Hence AS already submitted, **M2M services that involve the use of Public Networks like Cellular Mobile should be allowed to be provided only by Licensed Service Providers i.e. Licensed TSPs {(UASL/UL (AS)} or Licensed VNOs.**

d. We thus submit that there is no need for any amendment to current Licensing structure for M2M Services and that any entities such as System Integrators who have created local networks or platforms and require access to Public networks for enabling end to end M2M services to the end consumers on a commercial scale should necessarily obtain a UL or a UL (VNO) to be able to sell M2M services.

Q2. In case a licensing framework for MSP is proposed, what should be the Entry Fee, Performance Bank Guarantee (if any) or Financial Bank Guarantee etc.? Please provide detailed justification.

Idea Submission:

a. As already submitted, we believe that there is no need for any amendment to current Licensing structure for offering M2M Services and the same can be offered by any service provider after obtaining a UL (Access Authorization) or a UL (VNO).

b. Thus there are already options available in the current regulatory regime for offering of M2M services, and their evolution and adoption by service providers wanting to offer M2M services needs to be allowed through the free play of market forces.

Q3. Do you propose any other regulatory framework for M2M other than the options mentioned above? If yes, provide detailed input on your proposal.

Idea Submission:

a. We request you to kindly refer to our response against Q1.

Q4. In your opinion what should be the quantum of spectrum required to meet the M2M communications requirement, keeping a horizon of 10-15 years? Please justify your answer.

Idea Submission:

a. The Authority has correctly pointed out in the Consultation Document that, "*Spectrum management is an important issue for ensuring availability and capacity for M2M/IoT communications*." The Authority is also right in pointing out the huge demand potential that exists with M2M /IoT devices in the future, *"Industry analysts estimate the number of connected devices could be anywhere from 20 billion to 100 billion by 2020.*"

b. With such a huge demand potential over the next 3-4 years, there is a need to have application classification with clear architecture, scaling mechanism & a standard protocol that will help to design & dimension the IoT radio requirement. IoT devices are expected to have dedicated interference free radio channels which will help in reducing the SoC complexity & simple radio interface communication protocol.

c. It is submitted that the quantum of spectrum is dependent on number of applications & type of applications, number of devices at one place, number of spectrum bands available for different applications. For example, for a simple static application which requires only text, minimum requirement for devices is 200 Khz if we consider the EGSM, but for other protocols like ZigBee & others that work on wide spectrum, the requirement may range from 5Mhz to 20Mhz. However, for the same Simple text or alarm application on EGSM, if there are a maximum of 10 simultaneous always ON applications in one proximity, the requirement will be 2MHz (200 KHz*10) assuming LPWA will have less interference issue between devices. Further, If the application is based on wide area network that will use Multicastor broadcast, it may require Reuse factor in which case, the quantum of spectrum required will further increase based on the demography & range of spectrum used for the application (lower frequency requires less bandwidth but the higher frequency requires higher bandwidth). Similarly, for a Video/Imaging application on LTE NB-IoT, 1.4 Mhz per channel requires 14MHz & may further increase if the application works in Wide Area Network. **Thus, it can be seen that the Quantum of spectrum can only be determined if the service application & the use of it is defined.**

d. However, that said, it is submitted that there is no need for any separate allocation of Spectrum for M2M Services. M2M Services can be continued to be provided over the licensed spectrum acquired by TSPs for the following reasons:

i. Licensed spectrum is most suited to deliver the reliable, high quality M2M/IoT services. This is because Licensed Spectrum has a very low risk of facing interference and its usage can be calibrated to provide desired SLAs for M2M usage, even over wide areas.

ii. Licensed spectrum has coverage capabilities to support rapid M2M/IoT growth as cellular networks using licensed spectrum are able to provide seamless coverage across LSAs.

iii. The underlying network resources for both M2M and P2P communication are the same.

e. Thus, in the light of the above, we submit that there is no need for any separate allocation of Spectrum for M2M Services and no estimates are thus required.

Q5. Which spectrum bands are more suitable for M2M communication in India including those from the table 2.3 above? Which of these bands can be made delicensed?

Idea Submission:

a. **It is submitted that Low frequency bands (380MHz to 500 Mhz from Sr. no. 1 to 18 of Table 2.3 of the Consultation Document) are more suitable for M2M communication as they have good radio propagation property & are least impacted by penetration losses.**

b. **It is further submitted that at present, there is no need to introduce any additional de-licensing of spectrum bands for promoting M2M for the following 2 reasons:**

   i. There is already sufficient amount of de-licensed spectrum available for current M2M needs and it is under-utilized.

   ii. M2M communication technology deployment is still at a nascent stage and is continuously evolving with open platforms and open protocols. Further, IoT with licensed & unlicensed/de-licensed bands is still getting discussed in different forums across the globe and considering global references may work in a wide spectrum band from VHF to UHF including licensed and unlicensed spectrums. The emergence of new M2M / IoT technologies has also been acknowledged in the Consultation Document, "*A number of new M2M/IoT oriented technologies are also emerging typically geared towards narrower band applications with potentially large volumes of data transactions, using short/long range technologies and minimum/very low power consumption to preserve battery life*." Thus International Harmonization of M2M / IoT Bands is still work in progress. Hence, any premature de-licensing of bands would prevent us from taking full advantage of the benefits from international harmonization**.** The Authority may kindly note that it has itself in its Recommendations on "**Delivering Broadband Quickly: What do we need to do?**" advised the following with respect to making more spectrum available, "*Align spectrum bands with globally harmonized bands to achieve interference-free coexistence and economies of scale".*

c. **It is thus submitted that any de-licensing of spectrum bands for the purpose of promoting M2M communications should not be carried out at present**.

Q6. Can a portion of 10 MHz centre gap between uplink and down link of the 700 MHz band (FDD) be used for M2M communications as delicensed band for short range applications with some defined parameters? If so, what quantum? Justify your answer with technical feasibility, keeping in mind the interference issues.

Idea Submission:

a. **We submit that there should be no allocation/de-licensing in 10 MHz center gap in 700 MHz band which is a valuable band for Cellular LTE networks due to its efficiency and higher penetration inside buildings**. This is because LTE band 4G device sensitivity is as low as -140 DBm and thus interference is likely to become a real challenge in Indoor & Rural poor coverage. It is pertinent to mention here that depending on whether the application is using text or image or Voice or Video and the bandwidth requirement, sensitivity can be easily calculated for the 4G device.

b. Any de-licensing of frequency range in the 10 MHz centre gap would pose considerable interference risks without providing any significant benefits due to uncoordinated use.

Q7. In your opinion should national roaming for M2M/IoT devices be free?

(a) If yes, what could be its possible implications?

(b) If no, what should be the ceiling tariffs for national roaming for M2M communication?

Idea Submission:

a. It is first submitted that a vast majority of the M2M applications would be using packet switched data as the communication medium and only a small number of M2M application are expected to use Voice / SMS as the communication medium for which the roaming tariff is currently regulated by TRAI.

b. Idea Cellular recommends that the tariff for M2M / IoT devices should be kept out of the purview of any roaming regulation for the following 2 reasons:

i. M2M being an enterprise solution, there would be involvement of commercial negotiations between concerned parties, and thus determination of roaming tie-ups and tariffs is best left to the free play of market forces.

ii. M2M development is still at a very nascent stage globally. Thus, innovations in tariffing and product construct would be critical to help grow the market. Any regulation on roaming tariffs is likely to discourage marketing innovations thereby appreciably slowing down the pace of M2M device penetration.

c. Roaming arrangements, including the charges thereof, should thus continue to be left to mutual / bilateral commercial agreements between the transacting parties for usage of network services.

Q8. In case of M2M devices, should;

(a) roaming on permanent basis be allowed for foreign SIM/eUICC; or

(b) Only domestic manufactured SIM/eUICC be allowed? and/or

(c) there be a timeline/lifecycle of foreign SIMs to be converted into Indian SIMs/eUICC?

(d) any other option is available?

Please explain implications and issues involved in all the above scenarios.

Idea Submission:

a. We believe that the M2M market is at a nascent stage of its evolution and Regulatory flexibility on some fronts has to be available to all stakeholders to ensure its massive uptake and usage.

b. **We feel that the adoption of roaming models and further innovations around them in the context of M2M services needs to be driven by market forces for the best solutions to evolve in future and there should not be any mandate in this regard.**

c. Mandating or prohibiting any model by regulatory prescription is likely to hamper the growth of this revolutionary technology that can significantly impact the way we live and lead our lives, and the SPs should therefore be allowed to have choice around the method(s) to be adopted by them.

Q9. In case permanent roaming of M2M devices having inbuilt foreign SIM is allowed, should the international roaming charges be defined by the Regulator or it should be left to the mutual agreement between the roaming partners?

Idea Submission:

a. Please refer to our response to Q 7.

Q10. What should be the International roaming policy for machines which can communicate in the M2M ecosystem? Provide detailed answer giving justifications.

Idea Submission:

a. It is first submitted that from a technical standpoint, M2M roaming is akin to standard P2P roaming and would follow the standard roaming processes as already defined by 3GPP & GSMA (IREG group).

b. As for commercial arrangement and settlement processes, it should follow standard roaming processes defined by GSMA (WAS group).

c. Hence, there is no need for a separate international roaming policy for Machines to communicate in the M2M ecosystem.

Q11. In order to provide operational and roaming flexibility to MSPs, would it be feasible to allocate separate MNCs to MSPs? What could be the pros and cons of such arrangement?

Idea Submission:

a. It is submitted that in the current scenario, the Mobile Network Codes (MNCs) are allocated to Mobile Network Operators in line with the National Numbering Plan.

b. Further, as submitted by us earlier under response to Question 4, TSPs (Mobile Network Operators) are best suited to provide M2M Services over the cellular mobile networks because of the licensed spectrum that allows provisioning of high quality M2M services over seamless networks.

c. In view of the same, as already submitted, M2M services that involve the use of Public Networks like Cellular Mobile or Fixed-line Networks or Public Internet should be allowed to be provided only by Licensed Service Providers i.e. Licensed TSPs {(UASL/UL (AS)} or Licensed VNOs. There is thus no need for allocation of separate Mobile Network Codes for M2M Services.

d. Finally, it is also submitted that TSPs should have the operational flexibility to choose and use MNCs for M2M services, as they deem fit, from the series of MNCs allotted to them.

Q12. Will the existing measures taken for security of networks and data be adequate for security in M2M context too? Please suggest additional measures, if any, for security of networks and data for M2M communication.

Idea Submission:

a. It is submitted that M2M is an open platform with different protocols. Protection against security threats at device access level, IP connectivity to gateway, Point of interconnections & platform application level is required. If M2M follows standard protocols like GSM or LTE then the protocol of cellular network will manage to provide the security function. 3GPP workgroup is already working on different releases for M2M specific requirements.

b. Further, the SIMs/Connections for M2M Services would generally be provisioned with restricted services i.e. would have communication capability limited to either a predefined telephone number or a server.

c. In view of the above, we feel that the current security measures taken by the Licensed TSPs on an ongoing basis under the provisions of the Unified License should prove sufficiently capable to deal with the security requirements for M2M connectivity and there should be no need for any additional mandates.

Q13. (a) How should the M2M Service providers ensure protection of consumer interest and data privacy of the consumer? Can the issue be dealt in the framework of existing laws?

Q13. (b) If not, what changes are proposed in Information Technology Act. 2000 and relevant license conditions to protect the security and privacy of an individual?

Please comment with justification.

Idea Submission:

a. As per us, the following points need adherence to ensure protection of customer interest and data privacy –
   i. The data which is critical to the functionality of the device is collected.
   ii. The collected data needs to be encrypted.
   iii. The device and all of its components properly protect the personal information.
   iv. The access to collected personal information is only allowed to authorized individuals.
   v. Strong authentication and authorization are applied and the credentials secured at all times.
   vi. Protection mechanism are in place for attacks such as DDoS and other vulnerability.
   vii. Ensure security of data in transit and rest. Only accepted encryption standards to be used.
   viii. Account lock out policy is enabled.
   ix. Logging is enabled for security audit purpose.

b. The updated IT Act 2008, primarily covers the punishment for offences committed in cyber security. This IT Act covers all the aspects related to cyber-crimes in context to the above-mentioned points.

c. However, Section 43 A 3 of IT Act 2008 states:
   "*Sensitive personal data or information" means such personal information as may be prescribed by the Central Government in consultation with such professional bodies or associations as it may deem fit*.

d. **We feel that the interpretation of such clauses is highly subjective and since IoT has access to a lot of sensitive personal information including Biometric information, a list of such personal**

data (including but not limited to) may need to be identified and published, which if compromised, would make one liable to appropriate punitive actions.

e. We also agree with the Authority's observation in the *Consultation Document, "To promote investment and innovation concurrently in the emerging sector of M2M communications, India needs to have in place balanced and clear rules for data security and privacy….The perceived risks to privacy and security, even if not realized, could undermine the consumer confidence necessary for the technologies to meet their full potential, leading to less widespread adoption and hence hamper the growth of M2M communications in our country."*

f. **We thus request the Authority to initiate a separate Consultation on this topic and invite all stakeholder comments so as to be able to holistically address all relevant privacy and data security issues in one go.**

Q14. Is there a need to define different types of SLAs at point of interconnects at various layers of Heterogeneous Networks (HetNets)? What parameters must be considered for defining such SLAs? Please give your comments with justifications.

Idea Submission:

a. **Idea Cellular feels that there is a need to define different types of SLAs at point of interconnects at various layers of Heterogeneous Networks (HetNets).**

b. This would ensure that Open Access network, third party Application platform, TSP network infrastructure are interconnected and shall adhere to SLA to provide required purpose of service.

c. This is because depending on type of application & type of service SLAs shall be designed at point of Interconnects at various layer.

d. Further, a few applications may require lowest latency while some applications might require highest availability always ON, while a few others may require burst data periodically. Latency, Guaranteed Bandwidth, Availability, zero error communication, etc. are some of the realities of network management, and they need to be acknowledged and catered to.

e. **Thus, Idea Cellular feels that there is a need to define different types of SLAs at point of interconnects at various layers of Heterogeneous Networks (HetNets).**

Q15. What should be the distributed optimal duty cycle to optimise the energy efficiency, end-to-end delay and transmission reliability in a M2M network?

Idea Submission:

a. Ideally QoS norms for M2M should be defined by any Standards Body for facilitating optimum network performance.

b. **However, at this present point in time, we are not in favor of any regulatory mandates for the following 2 reasons**:

i. QoS requirements will vary with the type of M2M application and the requirements being met from it. Hence, diverse QoS requirements will have to be incorporated in the application design on a case to case basis. That being the case, it is advisable that the QoS levels being offered be left to mutual agreements between transacting parties for the time being, so that the market can grow without any hindrances.

ii. Technical specifications are still evolving to meet the requirements of M2M / IoT communication, as M2M is still at a very nascent stage in its evolution. It is critical that the standards are allowed to become sufficiently mature and stable before any regulation on QoS is notified.

Q16. Please give your comments on any related matter not covered in this consultation paper.

Idea Submission:

a. **We believe that the KYC requirements in the case of M2M services /communications need to be fundamentally different from the P2P services. For example:**

- The M2M SIMs has authorization for limited services only. These SIMs fitted with devices communicate to an automated dedicated client server mostly on private APNs.

- M2M works in a more restricted environment compared toP2P. Even if these SIMs are enabled for Voice & SMS, it would be to predefined numbers in a closed user group only.

- M2M connections are sold to various businesses enterprises and they use these SIMs/connections for providing M2M services in equipment such as cars, electricity meters etc. These connections thus are to be treated as corporate/bulk connections.

b. In view of the above, there is a need to simplify the existing KYC norms keeping in mind the M2M use case.

****