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Subject: COAI response to TRAI Consultation Paper on 'Spectrum, Roaming and QoS related requirements in Machine-to-Machine (M2M) Communications'

Dear Sir,

This is with reference to the Consultation Paper on "**Spectrum, Roaming and QoS related requirements in Machine-to-Machine (M2M) Communications**" issued by TRAI on October 18, 2016.

In this regard, please find enclosed our response on the consultation paper.

We hope that our submissions will merit your kind consideration and support.

Thanking You,

Yours faithfully,

Rajan S. Mathews
Director General
COAI

Copy to: Shri. Sudhir Gupta, Secretary, TRAI



**Response to TRAI Consultation Paper on
Spectrum, Roaming and QoS related requirements
in Machine-to-Machine (M2M) Communications**

I. Executive Summary:

1. There is no need for any change in any of the existing License conditions for provision of M2M Communication. These services should continue to be provided under UASL/Unified Licence (Access Service Authorization).
2. Any entities such as System Integrators who have created local networks such as LORA, WLAN etc. or platforms and require access to Public Networks for enabling the end to end M2M communication should obtain UL-VNO License as the reselling of Telecom Services is allowed only in VNO framework.
3. There is no need for any separate allocation of Licensed spectrum for M2M services; the operators should be free to use the Licensed spectrum acquired by them for M2M and P2P communication.
4. There is no need to de-license any additional bands for promoting M2M Services or otherwise.
5. Unified License conditions are sufficient as far as security requirements are concerned; therefore there is no need for any special security measures for M2M communication over the Public Networks.
6. There is no requirement to prescribe QoS requirements for telecom bearer services for M2M services; these should be left to mutual commercial agreements between transacting parties.
7. KYC norms should be simplified keeping in mind the M2M use case.

II. Preamble

We would like to thank the Authority for giving us the opportunity to respond to the Consultation Paper. At the outset, we would like to submit our views on the broader aspects related to the Consultation Paper.

1. M2M Communication is a Telecom Service:

- a. M2M Communication or Machine to Machine Communication can be provided by using various technologies.
- b. The only difference between M2M Communication and Person to Person (P2P) communication is that instead of humans sitting at the end of the communication channel (in P2P communication) there would be machines such as sensors, meters etc. which would be using the communication channel.
- c. Even today, in one form or other, M2M Communication is being used. One such example is collection of Electricity meter reading (through circuit switched or Packet switched data transfer from remote SIM installed Meters).
- d. **As deduced from the above, the underlying network infrastructure for M2M and P2P Communication is the same; therefore, M2M Communication which involves the use of Public Networks like Mobile Cellular networks, PSTN or Public Internet is a Telecommunication service which comes under the ambit of Indian Telegraph Act.**
- e. The various models referred to by Authority in the Consultation Paper such as the “Generic M2M Network architecture” by TEC are reference technical models only and in practical deployments, M2M communication may or may not follow these models. Thus, there cannot be any linkage to these models while forming the Regulatory guidelines for M2M services. The same is clearly deduced as mentioned in section 4.4 of TEC Technical Report (M2M gateway and architecture) :

“The names assigned to different service provider entities are for illustration purposes only and have no link with any category of existing or proposed service providers from licensing and regulatory angle.”
- f. Therefore, we would like to emphasize and submit that there is no need to amend the Licensing Structure for M2M Services. **The Licensed entities i.e. licensed TSPs who have obtained UL (with Access Services Authorization) or a VNO (with Access services authorization) under UL-VNO framework should continue to be allowed to provide M2M communication Services.**

2. M2M Services should be permitted to be provided by Licensed Service Providers only:

The framework for introduction of M2M Services should be grounded firmly on the principles of current Unified Licensing Regime. We would like to submit that M2M Service should be permitted to be provided only by Licensed Service Providers. Key points in this regard for the consideration of TRAI are as below:

- a. As submitted, M2M Communication is a Telecommunication Service which comes under the ambit of Indian Telegraph Act and should therefore be allowed under only Unified Licensing Regime.
- b. It is to be noted that basic premise, that access to Public Networks such as Cellular mobile Networks, fixed-line networks or Public Internet should be enabled by Licensed Entity remains the same, whether it is M2M Communication or P2P Communication.
- c. By the term Licensed Service Provider, we infer to the Service Provider who has obtained the required License, established its own Network for providing bearer services or has obtained UL-VNO for the reselling of Telecom services.
- d. We would also like to highlight here that the Licensed TSPs have invested about **INR 9,27,000** in the sector which has enabled the orderly growth of the telecom sector:
 - i. A world class telecom infrastructure comprising of about **13 lakh BTSs** (of which approx. 6.5 lakhs BTSs (3G and LTE) provide high speed internet connectivity) has been deployed.
 - ii. TSPs have invested INR 3,56,226 crores in Spectrum Auctions alone since 2010.
 - iii. TSPs are among the highest contributors to Govt. Exchequer, nearly INR 70,000 crores per annum are contributed by TSPs towards the Exchequer.
- e. The above has been made possible due to long term commitments made by the licensed operators under a Licensing Regime.
- f. Further, with technological evolutions it is possible to provide various advanced features like NB-IOT over the current telecom infrastructure through software upgrades which significantly reduces the time to market of these IoT/M2M solutions. The networks of TSPs follow 3GPP and other standards which provide secure and reliable communication for both M2M and P2P communication.

3. M2M Services cannot be provided under a Registration

- a. Under a valid registration certificate (say OSP registration), the customer/party can only operate a particular service or platform only for its own use and not to further resell it. **Reselling of telecom services has specifically been prohibited unless the same is done under a UL (VNO) framework.**
- b. If M2M Services are allowed under a Registration, it will create 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 licensing and regulatory framework but also to 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.**

- c. Further, as pointed out rightly by the Authority in the Consultation Paper, there are issues of mobility, numbering, roaming and interoperability with M2M Services, while OSPs do not involve/face these issues.
- d. Many M2M Services are supposed to be mission critical in city operations which would require secure and reliable communication. **Therefore, we submit that it is imperative that M2M Services should be allowed to be provided by Licensed Entities only.**

4. M2M under UL (VNO):

- a. **Reselling of telecom services is permitted only under a UL-VNO framework**, therefore, in cases where a particular entity has established its platform and further needs to communicate over the Public Networks such as Cellular Mobile Networks to establish end-to-end M2M communication, should obtain VNO License as such an arrangement would be nothing but a sort of reselling arrangement for telecom services.
- b. TRAI in its recommendation on 'Introducing Virtual Network Operators in telecom sector' dated May 1, 2015 has acknowledged that a system integrator providing the M2M service can acquire a VNO license and get into an agreement with a TSP for such services

*"2.17 **With the increasing deployment of Smart Grids, Smart Transportation, Smart Cars, Smart consumable durables, Machine-to-Machine (M2M) communication and Internet of Things (IoT) converged technologies are coming to occupy center stage in peoples' lives. This will require that the machines or the equipment is embedded with a device at the manufacturing stage itself which has the capability of communicating with either other devices or a central controller through wireless or on IP platform. The present licensing framework does not have adequate provisions to facilitate these new developments. With the introduction of VNOs, a system integrator for such a network can acquire a VNO licence and get into an agreement with a TSP for such services.**"*

- c. The TRAI recommendations have been accepted by DoT and guidelines and UL (VNO) has also been issued.
- d. Thus, we sincerely submit that it is amply clear from TRAI's recommendation on introduction of VNO that the same was recommended with a view to address the emerging scenario for M2M. Thus, any entity/system integrator who wants to provide M2M Services should obtain a VNO-License.

5. Spectrum for M2M communication

- a. We submit that licensed spectrum acquired through well-established process of auctions can and should be used/ continued for providing M2M Communication as well. For example, the latest cellular standard (3GPP Release 13) allows GSM and LTE networks to support LPWA IoT applications in almost all licensed mobile bands.
- b. Licensed Spectrum is required for providing reliable telecommunication services which is essential for mission critical M2M Services like M-health etc. which require reliable communication.
- c. In view of the above, we submit that assignment of any separate spectrum for M2M services is neither necessary nor warranted. Therefore, there is no need for any separate allocation of spectrum of M2M Services.

III. Response to issue wise queries:

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.

COAI Response:

We submit that there is no need for any amendment to current Licensing structure for M2M Services. Unified Licensing Regime clearly lays down the principles for enabling any access to the Public Networks. This can be enunciated as below:

- a. Machine-to-Machine communication involves the communication between the two devices instead of person to person communication.
- b. Under the Unified Licensing Regime, all the services which require 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 Licence (Access Services) only i.e. Licensed TSPs {(UASL/UL (AS))or Licensed VNOs.
- c. 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.
- d. As highlighted in the preamble of our response, M2M Services are already being provided by TSPs for enabling communication for applications like remote electricity meter reading etc.
- e. In view of the above, we believe that there is no need for any amendment in Unified License for Machine-to-Machine communication as **the same is already allowed to be provided by Licensed Service Providers under the existing License agreement.**
- f. **Any entities who have created local networks or Platforms and require access to Public Networks for enabling the end to end M2M communication should obtain UL-VNO License as the reselling of Telecom Services is only allowed in VNO framework.**
- g. Further, TRAI in its recent recommendations on Audiotex / Audio Conference/ Voice Mail services has clearly explained that in Audiotex/Voice Mail services/ Audio Conference services, the messages transferred are in the form of sign, writing, image, sound or intelligence. Accordingly, services covered under these have been recommended to be included under the definition of telecom services under Indian telegraph Act. On the

same lines, we believe that M2M Services are no different and thus should be allowed to be provided only by Licensed Entities.

- h. We have already enunciated in the preamble of our response that M2M Services cannot be provided under a Registration as reselling of Telecom Services is not allowed under a registration but is intended for own consumption. Further, allowing M2M services under a registration would create a Regulatory arbitrage, loss of revenue to exchequer and a creation of non-level playing field.
- i. With regard to international developments, as per the information available in Public domain, following are our submissions:
 - i. Singapore is providing M2M Services under a SBO License.
 - ii. In Brazil, M2M Services are being provided under MVNO arrangement.
 - iii. In Portugal also, M2M Services are considered as Electronic Communication Services.
 - iv. In Hong Kong, Class Licenses are issued for creating networks.

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.

COAI Response:

As submitted in our response to Q1, there is no need for any amendment in the current Licensing framework and the same can be offered under UL(AS) or UL (VNO) depending upon the business case.

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

COAI Response:

Please refer to our response to 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.

COAI Response:

a. Technological Aspects

Cellular mobile technology is evolving to meet the requirements of M2M and IoT communication. Release-13 of 3GPP includes all those features which are required for M2M/IoT communication. Cellular mobile technology works over the Licensed spectrum which is crucial for future of M2M Services provided over the Public Networks because of the following features:

- Licensed spectrum is vital to deliver the most reliable, high quality M2M/IoT services: Licensed spectrum is uniquely able to provide high quality of service guarantees over wide areas, as operators using the Licensed Spectrum are not at risk of facing interference and can control usage levels.
- Licensed spectrum has the coverage capabilities to support rapid M2M/IoT growth. Cellular networks using the Licensed spectrum provide seamless coverage across the LSA.
- International spectrum harmonization is vital for a global, affordable cellular IoT market.

b. Commercial Aspects:

As far as economies of scale is concerned, the TSPs are best placed to provide M2M services on the Cellular Technologies as they have invested heavily in building the networks.

- The Cellular networks which are used to provide Person-to-Person communication are best suited to provide M2M Services as well.
- No service provider is going to build cellular networks exclusively for providing M2M Services.
- TSPs acquire licensed spectrum through well-established process of auctions which can be used for providing M2M Communication as well. For example, the latest cellular standard (3GPP Release 13) allows GSM and LTE networks to support LPWA IoT applications in almost all licensed mobile bands.

Thus, in the light of the above, we submit 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 as the underlying network resources for both M2M and P2P communication would be the same.

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?

COAI Response:

a. Additional Delicensing of Bands:

We recommend that only licensed spectrum should be allowed to use M2M communication services. At present, there is **no need for additional spectrum to be de-licensed in** any band for promoting M2M or otherwise. There is already sufficient amount of unlicensed spectrum available, which is underutilized. Our further comments on this are as below:

- i. Unlicensed spectrum is not exclusively owned, so there is no central entity managing the effective use of this spectrum. There is a need to manage Interference (to support unlicensed mode) which undermines the advantages of the low-frequency spectrum.
- ii. Only a fraction of the total spectrum can be used for supporting traffic at a time on unlicensed bands, as most will end up being consumed as a backup resource to support "frequency hopping" as it is in the case of conventional Wi-Fi (In 2.4 GHz band which is used by conventional Wi-Fi) 1/10th of the spectrum is used as any time to total available and assigned). Therefore, any delicensing leads to inefficient use of spectrum
- iii. Sufficient quantum of Delicensed Spectrum is already available for the operation of various technologies, which is highly underutilized.

Q6. Can a portion of 10 MHz center 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.

COAI Response:

- a. We submit that there should be no allocation/de-licensing in 10 MHz centre gap in 700 MHz band. Our submissions in this regard are:
 - i. 700 MHz is an important band for Cellular LTE networks.
 - ii. It would play an important role in rural broadband penetration through cellular networks.
 - iii. In view of the above, it is important that this band is ensured to be free from interference effects. Going by the current experience, Cellular networks are already

suffering from interference from various sources such as illegal repeaters, jammers etc.

- iv. It may not be possible to use the duplex gap (748 to 758 MHz) of Band 28 for NB-IoT applications because this band has a dual duplexer and filter design that would essentially need at least 10 MHz of clear duplex gap to avoid any uplink-downlink type of interference issues.
- v. Therefore, 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.
- vi. Further, to the best of our knowledge, there is currently no international standard or precedent for any such allocation of centre gap. Therefore, any deliberation on this issue at this stage is premature.

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?

COAI Response:

- a. With regard to national roaming, we would like to submit that M2M being an enterprise/wholesale solution should not be governed by retail regulations.
- b. Roaming arrangements, including the charges thereof, should thus continue to be left to mutual commercial arrangements between the transacting parties.

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.

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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?

&

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

COAI Response:

Since our members have divergent views on this issue, they would respond individually.

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?

COAI Response:

- a. In the current scenario, the Mobile Network Codes (MNCs) are allocated to Mobile Network Operators.
- b. As submitted by us in response to Question 4 that TSPs (Mobile Network Operators) are best suited to provide M2M Services over the cellular mobile networks as no operator is going to build networks exclusively for providing M2M Services.
- c. **Therefore, we submit that there is no need for allocation of separate Mobile Network Codes for M2M Services.**
- d. Further we submit that Mobile Network Operators should be free to choose MNCs 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.

COAI Response:

- a. As submitted by us in response to Q1, M2M Services should be allowed to be provided by Licensed Service Providers holding UASL /UL (VNO) or under VNO.
- b. Unified License itself contains several security conditions, which a Licensee has to abide to for the providing access to public networks, which are comprehensive and sufficient for M2M connectivity.
- c. The SIMs/Connections for M2M Services would be provisioned with restricted services i.e. would be allowed to communicate to predefined telephone number or a server and therefore, the existing conditions would be sufficient for secure M2M connectivity.

- d. **Therefore, there is no need for any additional requirements for specifying security of networks as existing conditions in Unified License are adequate for M2M services.**

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?

(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.

COAI Response:

Please refer to our response to Q12.

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.

COAI Response:

- a. Network designing and planning is a complex task which takes various technological and logistical aspects into consideration.
- b. The cellular technology is evolving as per the various standards which are based on various technological considerations for different applications such as M2M/IoT.
- c. **Hence, the best approach in this regard would be to allow maximum flexibility to TSPs to design their networks instead of defining SLAs at various points through any kind of Regulatory mandate.**

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

COAI Response:

- a. As submitted above, M2M being an enterprise/wholesale solution should not be governed by retail regulations. QOS norms should be left to mutual commercial agreement between the transacting parties.
- b. Further, technical specifications are evolving to meet the requirements of M2M/IoT communication and there should not be any Regulatory mandate in this regard.

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

COAI Response:

- a. We believe that there is a pressing need to review the KYC requirements in the case of M2M services /communications that are different from the P2P. For example:
 - The M2M SIMs have 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 as compared to P2P. 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 should be treated as corporate/bulk connections.
- b. In view of the above, there is a need to simplify KYC norms keeping in mind the M2M use cases.
