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Dated: 12th January 2017

To,

Shri Sanjeev Banzal,
Advisor (Networks, Spectrum and Licensing),
Telecom Regulatory Authority of India
Mahanagar Doorsanchar Bhawan
J.L. Nehru Marg, Old Minto Road
New Delhi – 110002

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

Dear Sir,

This is with reference to your above mentioned consultation paper. In this regard, please find enclosed our response for your kind consideration.

Thanking You

Yours Sincerely
for Bharti Airtel Limited

Ravi P. Gandhi
Chief Regulatory Officer

encl.: as stated above

Bharti Airtel Limited's Response to TRAI's Consultation Paper on "Spectrum, Roaming and QoS related requirements in Machine-to-Machine (M2M) Communications"

At the outset, we wish to extend our sincere thanks to the Authority for providing us with the opportunity to submit our response to this consultation paper. We hope that TRAI will consider our submissions favourably.

Indian Telecom Service Providers (TSPs) have been providing Machine-to-Machine communication (herein referred to as "M2M mobile services") in addition to Person-to-Person (P2P)/Person-to-Application (P2A) services for more than a decade. The only difference between M2M mobile services and P2P mobile services over the public network is that instead of a human being on either end of the communication channel (as in P2P communication), there are machines such as sensors, meters, etc. The underlying commercial network, spectrum and technology remains the same for both P2P and M2M mobile services to a large extent.

Thus, under the Unified License, the provision of mobile services for machines is no different from the provision of mobile services for human beings. Licensing requirements such as quality of service (QoS), tariffs, interconnection, roaming, security, and privacy of data, have already been stipulated in the Unified Licence and do not warrant any major modifications.

Lately, M2M mobile services have started evolving at a rapid pace due to the widespread adoption and proliferation of affordable wireless and broadband network, falling hardware/device costs, increasing battery life, new business models, the private sector's efforts to transform their business and the government's increased focus on using these services to enhance public welfare and improve the delivery of government services.

There will be many more connected machines than human beings in the coming decades. To keep pace with this, the existing licensing framework needs to be upheld to attract sufficient investments and serious players, create world-class M2M mobile services, and ensure the security of network and services as well as the privacy of data and customers. To achieve these objectives, the following will be the key factors:

1. M2M mobile services should continue to be provided by licensed entities:

In our current licensing framework, only two parties exist, i.e., TSPs and customers. Any party that wants to provide telecom services has to obtain a valid telecom licence.

A party availing telecom services for its own use becomes the customer. The reselling of telecom services is allowed only under a Unified Licence (VNO). Thus, the framework for providing M2M mobile services can have two parties:

(i) TSPs, i.e., UASL, Unified Licence (Access Service Authorization) or Unified Licence (VNO with Access Service Authorization), and
(ii) Customers (e.g., automobile manufacturers who would install M2M SIMs in their vehicles).

We believe that there is no need for a separate regulatory regime for M2M mobile services when all types of telecom services already fall under the ambit of the Indian Telegraph Act, 1885. We firmly believe that any separate licensing/registration for M2M mobile services (say, an OSP or M2M registration certificate) would only undermine the Unified Licensing framework and lead to the creation of regulatory arbitrage, non-level playing field, reselling of licensed telecom services by non-licensed entities (which is otherwise permitted only under a UL (VNO) licence), security and privacy concerns as well as a loss to the exchequer.

2. There is no need to reserve spectrum exclusively for M2M mobile services:

Spectrum is a scarce national resource that is granted for the creation of mobile telephony/broadband networks.

Till date, Indian TSPs hold an average of 309 MHz (unpaired) of spectrum across all bands and have paid more than INR 3,45,000 crores for acquiring spectrum since 2010. Further, mobile operators have invested more than INR 9,50,000 crores (including spectrum) for building a nationwide mobile network consisting of over 13 lac base transceiver stations (BTSs). In fact, no licensed entity can invest and create such a widespread mobile or broadband network for either the provision of P2P and M2M mobile services separately or exclusively for M2M mobile services, as it would be neither practical nor commercially viable. Thus, both mobile services (P2P and M2M) should be offered over the same commercial network.

TSPs can offer any type of technology or service over their spectrum. Like P2P, M2M mobile services are offered over 2G, 3G and 4G networks. Such a regime enables both the government and the TSPs to ensure the efficient usage of spectrum, both commercially and technically. Therefore, no licensed spectrum should be reserved

exclusively for the provision of M2M mobile services. Such a proposal, if implemented, would not only cause a huge revenue loss to the national exchequer, but also lead to sub-optimal utilization of spectrum due to restrictions placed on the usage of spectrum. Further, a dedicated network for M2M may not be commercially viable.

3. A light touch regulation is essential to innovate business models:

In a market-driven economy, commercial freedom and engagement are critical for attracting investments, running a business and delivering a value proposition to end customers. The freedom to explore various commercial arrangements for M2M mobile services will encourage the development of innovative services and sustainable business models.

In general, M2M agreements (like other enterprise deals) work in many ways such as fixed fee deals, monthly charges, variable charges on the basis of traffic, and are dependent on bandwidth, latency, speed, and network KPIs. In most cases, the pricing of M2M mobile services is not on a "per MB" basis. For example, the M2M monthly charges for a taxi service might be Rs.300 while those for an electricity meter might be Rs.15. Even when the data usage is less, such as at a Point of Sale (POS), the rates might be relatively higher due to the amount of signalling involved and the duration for which the session remains active.

Thus, we believe that market forces should be allowed to develop various business models, including the charges for M2M mobile services.

4. Secured M2M mobile services are essential to safeguard critical infrastructure and the economy:

With the growth of M2M mobile services, especially in critical infrastructure such as power and water utilities, network security assumes crucial importance. Security becomes a consideration not just at the application level, but also at the network level in order to prevent the compromise of the entire M2M infrastructure.

As the recent incident of the debit card hack has shown, M2M/IoT devices are extremely vulnerable to security breaches, which makes them not only easy to hack but also to commandeer in order to take down large sections of the Internet. As grids become smart, these attacks could also become intense.

In the interest of national security, all M2M/IoT devices ought to be allowed to connect only to local cloud infrastructure, via licensed operators who offer security layers as part of their license conditions. Further, 3GPP standards for M2M devices should be mandated to avoid any security threat to the telecom network. In fact, TSPs can adhere to additional security measures as long as they are not forced to compete with unlicensed operators who provide unsecured M2M connections.

In light of the aforesaid submissions, we would like to provide our comments on the questions raised in the consultation paper:

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.

Airtel's Response:

1. We recommend that M2M mobile services should continue to be provided by licensed TSPs holding a UAS Licence/Unified Licence (Access Service Authorization) or a Unified Licence (VNO with Access Service Authorization).

2. M2M mobile services are not a new type of service; TSPs have been providing these services for several years now. For example, Airtel has been offering M2M mobile services in various sectors such as Banking, Financial Services and Insurance (BFSI), retail, manufacturing and distribution for several years.

3. Under the UAS Licence/Unified Licence (Access Service Authorization), the access services[1] cover collection, carriage, transmission and delivery of voice and/or non-voice messages over the Licensee's network in the designated service area. The Licensee can also provide Internet Telephony and other internet services, including IPTV, broadband services and triple play, i.e., voice, video and data. The licence has not created any distinction between P2P and M2M mobile services; both use the same connectivity, communication channels, spectrum, network, technology and mobile SIMs.

4. Thus, the offering of M2M mobile services over a public network is a type of access service and can only be permitted under a telecom licence granted under Section 4 of the Indian Telegraph Act, 1885. The basic premise that access to a public network can only be provided by a licensed entity remains the same, whether it is for P2P or M2M mobile services and, therefore, a separate licensing framework for P2P and M2M services is unwarranted.

[1] Unified Licence – Access Services (AS) means telecommunication service provided to subscribers by means of a telecommunication system for the conveyance of voice or non-voice messages through wired or wireless telegraphy on the network of the Access Service Provider. The subscriber shall have identity indicated by a number or any other address approved by the Licensor. The subscriber shall be registered and authenticated by the network of Access Service Provider. Access Service does not cover broadcasting of any voice or non-voice messages. However, Cell Broadcast is permitted only to the subscribers of the service. Scope of Service provided under the Access Service Authorization shall be governed by the terms and conditions as provided in Chapter VIII.

5. In fact, in its recent recommendations[2], TRAI has stated that while providing Audio Conference/Audiotex/Voice Mail services, the messages transferred are in the form of sign, writing, image, sound or intelligence. Thus, the equipment used for these services therefore may be covered under the definition of telegraph as defined in the Indian Telegraph Act, 1885. The same views are also relevant in the context of M2M mobile services.

6. Furthermore, a uniform licensing framework is also critical as the lines between M2M and P2P are getting blurred and will continue to do so. For example, M2M SIMs are now available with an SMS fall-back option and are increasingly becoming voice-controlled. Vehicle-tracking systems are also being replaced with smartphone applications. A large number of wearable devices are synced with smartphones.

7. Recently, the issue of an appropriate licensing framework for reselling M2M mobile services was also deliberated by TRAI during the consultation exercise for the introduction of virtual network operators (VNOs). In its recommendations[3], TRAI had stated "*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 centre 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.*** Pursuant to these recommendations, DoT has already introduced the Unified Licence (VNO). Therefore, entities who want to resell M2M mobile services can always obtain a VNO licence by tying up with the TSPs. Therefore, a new type of licence is not required.

8. We oppose the provision of M2M mobile services under OSP registration. Under OSP[4], an entity does not provide telecom services but only uses the telecom resources of licensed TSPs to provide their own services such as BPO, KPO, call centres, etc. In contrast, M2M mobile services are telecommunication services. In fact, under an OSP registration, the customer/party can operate a particular service or platform only for

[2] TRAI's Licensing framework for Audio Conferencing/Audiotex/ Voice Mail Services dated 16.12.2016

[3] http://www.trai.gov.in/WriteReadData/Recommendation/Documents/Recommendations_VNO_01_05_2015.pdf

[4] Unified Licence - OTHER SERVICE PROVIDER (OSP) means Indian company registered with DoT to provide application services like tele-banking, tele-medicine, tele-education, tele-trading, e-commerce, Call centre, network operation centre and other IT enabled services by using telecom facilities provided by various Telecom Licensees

its own use and not to resell it further. The provision of M2M mobile services deals with issues related to mobility, numbering scheme, network codes, roaming, interconnection and interoperability, which are not allowed to OSP registration holders and, therefore, will require a licence to be obtained as per the Indian Telegraph Act, 1885.

9. Furthermore, in its recent recommendations[5], TRAI has also reiterated the scope and purpose of the OSP registration certificates. It stated that "*With regard to the views expressed by some of the stakeholders to allow for these services with registration under OSP category, **it is felt that OSP category has been created with a different intent and purpose.** According to the terms and conditions for Other Service Providers category notified by Department of Telecommunications on 5th August, 2008, 'Other Service Provider (OSP)' means a company providing Application Services. **Application Services have been defined to mean services like telebanking, tele-medicine, tele-education, tele-trading, e-commerce, call centre, network operation centre and other IT Enabled Services, by using telecom resources provided by authorised telecom service providers.** So, Voice Mail/Audiotex/UMS services are not covered under the definition of Application Services eligible for registration under OSP category.*

10. We also oppose any separate registration certificate (say, an M2M service provider) since it has neither been envisaged in our licensing framework nor has it been contemplated in the National Telecom Policy, 2012. In fact, after the introduction of the Unified License by DoT in August 2013, all services have been subsumed under the Unified License.

11. Globally, many countries have supported a licensing framework for the provision of M2M services. For example, In Singapore[6], an entity has to obtain a Service-Based Operations (SBO) Licence for providing M2M services. In Brazil[7], M2M services are being provided under a MVNO Licence. In United Kingdom[8], M2M services are provided under a Business Radio (BR) Licence. It appears that in Malaysia[9] also, M2M services are provided under a separate MVNO Licence.

[5] TRAI's Licensing framework for Audio Conferencing/Audiotex/ Voice Mail Services dated 16.12.2016

[6] https://www.imda.gov.sg/~/media/imda/files/regulation%20licensing%20and%20consultations/licensing/licenses/sboguide.pdf?la=en

[7] TRAI's Consultation Paper on Spectrum, Roaming and QoS related requirements in Machine-to-Machine (M2M) Communications' dated 18th October 2016

[8] https://www.ofcom.org.uk/__data/assets/pdf_file/0029/78563/vhf-iot-statement.pdf

[9] http://www.myevolution.my/wp-content/uploads/2013/06/20120612-Presentation-UserGroup-Comptel.pdf

12. Therefore, we recommend the following to TRAI:

a. **M2M mobile services should continue to be provided only by entities holding CMTS/UASL and Unified License (Access Service Authorization).**
b. **Reselling of M2M mobile services should only be done by way of a Unified License (VNO – Access Service Authorization).**
c. **Since TSPs have already been offering M2M mobile services for more than a decade, it does not warrant any specific amendment to continue providing these services under their current licences.**

13. While it is important at this juncture to strengthen some areas of the regulatory framework for M2M mobile services, any change in the licensing framework for M2M mobile services is unwarranted. The limited regulatory interventions that we envisage are the allocation of a separate numbering scheme and KYC rules for M2M mobile services. For example, TSPs are currently using a 10-digit numbering series for wireless SIM-connected M2M devices. Since the growth of M2M mobile services could put undue strain on the existing numbering series and end up reducing the capacity for P2P mobile services, a separate numbering series for M2M mobile services is required.

14. In fact, DoT has already approved[10] a 13-digit numbering series for SIM-based M2M devices which will co-exist with the prevalent 10-digit mobile numbering scheme to be allocated for the Unified Licence (Access Service Authorization)/UASL.

15. Similarly, KYC norms for M2M mobile services (both for B2B and B2C) need to be streamlined. They cannot be the same for P2P and M2M due to the obvious differences (machines versus humans), as highlighted above.

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.

Airtel's Response:

[10] DoT's letter no. 16-5/2013-AS-III/Vol.II/133/481/ dated 9th December 2016

1. As explained in our response to Q1, we recommend that any entity that intends to offer M2M mobile services in India, should either obtain a Unified License (Access Service Authorization) or a Unified License (VNO with Access Services).

2. The government has already prescribed rules related to entry fee, PBG, FBG, eligibility criteria, regulatory levies, security of the network/services and privacy of customers, etc., in the Unified License guidelines for both types of licences and authorizations. We do not recommend any changes in these rules as they are liberal and not prohibitive in nature.

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

Airtel's Response:

1. As explained in our response to Q1 and Q2, we recommend either a Unified License (Access Service Authorization) or Unified License (VNO with Access Service) regime for providing M2M mobile services in India.

2. We do not recommend any other regulatory framework, such as registration certificate for M2M mobile services, due to the reasons stated above.

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.

Airtel's Response:

1. We believe that the existing licensed spectrum is sufficient to meet the demand for M2M mobile services. In fact, the capacity of existing TSPs is such that the current and expected M2M mobile traffic will remain a relatively small proportion of the total mobile traffic demand and, therefore, in itself will not drive increasing spectrum requirements. Nevertheless, TSPs could always buy additional licensed spectrum in a particular band via auction.

2. Furthermore, spectrum is utilized for mobile telephony/broadband network and for offering various types of technologies/services, of which M2M mobile services is only one subset. Therefore, no single or multiple frequency bands should be reserved only for M2M, since such a step will not only cause huge revenue loss to the national exchequer but also lead to sub-optimal utilization of precious spectrum resources. It is to be noted that like P2P, M2M mobile services are provided over 2G network (low bandwidth services, such as vending machines), 3G and 4G networks (for high bandwidth services such as streaming video) and, thus, a spectrum policy does not warrant a separate framework for P2P and M2M mobile services.

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?

Airtel's Response:

1. In continuation of our response to Q4, we reiterate that M2M mobile services are a type of access service and can only be provided over licensed spectrum allocated in different bands.

2. Like P2P, a global harmonization of technology and spectrum would be most optimum for M2M mobile services as the underlying network, technology and spectrum is the same. For example, 3GPP and IEEE based technologies are harmonized globally and account for more than 10 billion connections today. Going forward, M2M mobile services would be the most successful if they are aligned with 3GPP & IEEE standards, since the spectrum bands identified and adopted by these standards are the most appropriate for M2M. Further, most of the network standards and device standards are also evolving towards the use of technologies like Low Power Wide Area (LPWA), which will run on the existing licensed spectrum. Therefore, the globally harmonized spectrum bands are the most appropriate for offering M2M mobile services.

3. We do not recommend any spectrum band to be delicensed for M2M mobile services as these services can only be offered under a telecom licence and over the licensed spectrum. If TRAI intends to de-license the spectrum required for the provision of one type of mobile services, then it requires a large deliberation over the spectrum policy for mobile services in India. It would be unfair that on one hand, P2P mobile services are offered over licensed spectrum bands and on the other hand, M2M mobile services

are offered over unlicensed spectrum bands. Such a proposal will create a non-level playing field and destabilize the whole spectrum licensing framework.

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.

Airtel's Response:

1. As elaborated in our response to Q4 and Q5, M2M mobile services would thrive only if they adhere to 3GPP/IEEE or equivalent international standards. It is, thus, recommended to align spectrum allocations with global standards and deployments.

2. Further, any spectrum band that can be granted commercially should not be declared as unlicensed spectrum, even partially, in order to avoid huge revenue loss to the government and to prevent wastage or sub-optimal usage of the spectrum.

3. TSPs would use their licensed spectrum in the 700 MHz band to offer P2P and M2M mobile services. The revenue projections from M2M mobile services will be a significant factor for determining the market value of the 700 MHz band. However, if some portion of the 700 MHz band is unlicensed, it will adversely affect the valuation of the 700 MHz band and cause a huge revenue loss to the exchequer as TSPs would be reluctant to pay a huge amount for this premium spectrum, given the huge risk of interference. Further, it will affect the level playing field as one TSP would be paying Rs.11,435 crore[11] for one MHz for offering P2P or M2M mobile services while another would end up paying nothing for an unlicensed portion in the same spectrum band for offering M2M mobile services.

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?

Airtel's Response:

[11] Reserve price of 700 MHz fixed by DoT during 2016 spectrum auction on an all-India basis

1. We recommend that the current tariffs for national roaming services in the form of ceiling tariffs[12] prescribed by TRAI are relevant for both P2P and M2M mobile services and should be continued. For example, the work done (in the form of underlying cost, call routing) for sending SMS or outgoing/incoming voice call (say on predefined numbers) on national roaming is the same for both P2P and M2M mobile services. Thus, we do not suggest any separate regulatory framework related to national roaming for P2P and M2M mobile services.

2. Further, determining the wholesale roaming tariffs of M2M mobile services (as they will consume data, signalling and other resources) under national roaming should be continued on the basis of mutual commercial arrangements between the TSPs. This is essential to avoid the misuse of the network resources of one TSP by another.

Q8. In case of M2M devices, should;

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

Airtel's Response:

We are not in favour of international roaming on a permanent basis for foreign SIM/eUICC, for the following reasons:

1. The provision of telecom services in India is an exclusive right granted to Indian licensees, who have invested thousands of crores acquiring spectrum and creating a world-class telecom and broadband infrastructure across the country. They have done so in the belief that they would be able to continue providing all types of telecom services within the country.

2. M2M is simply another type of mobile service, and allowing international roaming on a permanent basis for foreign SIMs in India will undermine the basic framework of the Indian telecom sector as well as adversely affect the business prospects and investments of Indian TSPs. It will de-facto allow foreign companies to sell Indian telecom services to international customers without needing to hold any valid telecom licence.

3. In the event of permanent international roaming, the bulk of the roaming revenue will remain outside the country, depriving Indian TSPs of their legitimate revenue and

[12] Telecommunication Tariff (60th Amendment) Order, 2015 dated 27.02.2015

causing a huge loss to the national exchequer. In addition, India will lose an opportunity to create its own standards and security measures. Furthermore, the SIMs that work on permanent roaming will not have KYC validity at the same level as local SIMs.

4. For M2M services, ensuring security is of crucial importance owing to its various applications in the present day. For example, the traffic in a smart city could be brought to a complete halt if their M2M-based solutions are hacked. Similarly, there would be many such applications that would require foolproof security systems. Therefore, Indian TSPs and companies would be helpless in case services are controlled from foreign countries using the foreign SIM/eUICC on permanent roaming, as the issue will fall outside their area of jurisdiction.

5. The traceability of foreign SIMs on permanent roaming would always be a matter of concern. On the contrary, a domestic SIM, which is verified as per DoT norms, will be traceable and easily identifiable.

Q8. In case of M2M devices, should;

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

Airtel's Response:

1. As elaborated in our response to Q8 (a), we do not recommend permanent roaming for M2M or the use of foreign SIMs for M2M mobile services in India. We also suggest that only domestically manufactured SIMs/eUICC should be allowed for the provision of M2M mobile services.

2. We believe that remote SIM provisioning can take care of all practical challenges. In fact, the GSMA's Embedded SIM Specification provides a single, de-facto standard mechanism for the remote provisioning and management of M2M connections, allowing "over the air" provisioning of an initial operator subscription, and the subsequent change of subscription from one operator to another. However, we recommend that such a process should adhere to all Indian license norms, including KYC.

3. Such a regime would also facilitate MNP regime for M2M mobile services at a later stage, fostering more competition in the M2M market.

Q8. In case of M2M devices, should;
(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.

Airtel's Response:

As elaborated in our response to Q8 (a) and (b), the existing foreign SIMs, if any, may be converted to Indian SIMs, within a reasonable time period, say 3 months.

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?

Airtel's Response:

1. As explained in our response to Q8, we oppose the concept of permanent international roaming on the visiting network.

2. Notwithstanding our position on this issue, we would like to state that international roaming arrangements are always mutually decided by two international operators, and the wholesale price of roaming has never been governed by TRAI. We recommend that the same policy framework that is used in P2P mobile services be maintained in the case of M2M mobile services as well. Any regulation on international roaming charges would be tantamount to regulating the wholesale price for international entities who are not even licensed to operate in India.

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

Airtel's Response:

We recommend that the international roaming policy for M2M be left to mutual agreement between two international operators. We do not suggest any regulatory framework related to international roaming for M2M.

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?

Airtel's Response:

1. We recommend that Mobile Network Codes (MNCs) should continue to be given only to TSPs holding CMTS/UASL/UL (Access Service Authorization). MNC is given for identifying a unique mobile telecommunication network within the country, which can only be created under a licence granted under the Indian Telegraph Act, 1885.

2. During the consultation process of VNOs, the issue of giving MNC to VNOs was also deliberated. However, even TRAI had recommended against the direct allocation of MNCs to VNOs despite the fact that VNOs already hold a Unified Licence.

3. In its recommendations[13], TRAI inter-alia stated, *"In case of introduction of MVNOs, one option could be that VNOs are assigned dedicated MNCs by the DoT so that they can have their own International Mobile Subscriber Identity (IMSI) range and SIM cards for uniquely identifying a mobile subscriber. With its own IMSI range it is possible that a VNO will be able to change its underlying NSO without having to change the SIM cards in the devices of all its customers.* ***However, this arrangement has challenges because if large number of MVNOs enter into the market, it will be difficult to manage network codes both operationally and administratively. Moreover, it will be difficult for DoT to monitor efficient utilisation of the numbering resources for such a large number of MVNOs. For VNOs of other services also, there will be an administrative challenge to get the numbering resources allocated from the DoT, particularly for those VNOs who plan to offer services in small districts/towns.***"

4. Thereafter, DoT accepted TRAI's abovementioned recommendations in June 2016 and decided not to allocate a separate numbering series to VNOs. Since the same grounds also apply to TSPs/VNOs providing M2M mobile services, we do not suggest any change in the allocation methodology.

13 http://www.trai.gov.in/WriteReadData/Recommendation/Documents/Recommendations_VNO_01_05_2015.pdf

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.

Airtel's Response:

1. Currently, TSPs are subject to stringent security and data guidelines. Some of these requirements are as under:
   - *TSPs audit their network or get the network audited from a security point of view once a year from a network audit and certification agency.*
   - *TSPs induct only those network elements into their telecom network that have been tested as per relevant Indian or international security standards.*
   - *TSPs include all contemporary features related to security, including communication security, as prescribed under relevant security standards while procuring the equipment, as well as implement all such contemporary features in the network.*
   - *TSPs comply with the conditions of Remote Access, which means that any location of remote access is to be approved by DoT in advance.*
   - *TSPs share customer-related data only with designated security agencies.*
   - *TSPs cannot share the data with agencies outside the country.*

2. With the implementation of these network guidelines, TSPs are resilient enough to withstand the risks and vulnerabilities arising from the external environment. Further, TSPs are subjected to heavy penalties in the event of non-compliance with any security norms.

3. Therefore, we do not suggest any additional security measures for M2M mobile services.

4. We also support the KYC norms for M2M mobile services in the larger interest of national security. While DoT has defined the KYC rules for P2P mobile services, they are not applicable to M2M mobile services due to the distinctive nature of mobile services (usage of mobile services by human beings versus machines).

5. We believe that any operator providing M2M mobile services should follow the KYC norms and traceability guidelines for all telecom resources, including SIM-enabled devices. The details of all the customers of M2M mobile services, i.e., the physical custodians of machines fitted with SIMs, shall be maintained by the operators providing M2M mobile services. Updated information regarding (a) details of M2M

end devices, i.e. IMEI, ESN, etc. (b) make, model and registration number of the machines (i.e. cars, utility meters, POS, etc.) and (c) corresponding physical custodian's name and address, shall be made available online through a web interface to the designated authority by such operators. Any changes in customer and machine details shall be updated at the respective web interface. Companies can follow either OTP-based or Mobile connect-based KYC norms for M2M mobile services.

3. (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.

Airtel's Response:

1. As elaborated in our response to Q1, M2M mobile services should continue to be provided only by entities holding a licence under Section 4 of the Indian Telegraph Act, 1885. Since Indian telecom licences have adequate provisions related to the protection of consumer interests and data privacy and are also subject to the Information Technology Act, 2000 (and the amendments thereof), we do not recommend any changes to the existing licence agreement.

2. It is critical that the customer data being collected by the mobile operators not be stored outside the country, in line with the present licence provisions. Additionally, the entities storing the data (directly from the customers and not from the mobile operators) should be subjected to Indian laws, giving Indian customers the ability to delete the stored data, if needed. We recommend that licensed entities providing M2M mobile services in India should make such a facility available to their customers.

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.

Airtel's Response:

1. As elaborated above, M2M has already been offered by TSPs over their network for the last decade. We do not support any separate QoS norms for M2M as the

underlying technology and network for M2M and P2P mobile services are the same. TRAI has already prescribed QoS norms for bearer services, both wireless and wireline (voice and data), and the same should also apply to M2M mobile services.

2. We believe that QoS norms for M2M cannot be static, as different M2M mobile services will have different QoS requirements. Although many M2M services have no stringent QoS requirements and can deal perfectly with best-effort QoS, some M2M services will have higher QoS or priority requirements than normal data services. For instance, smart meters may use less data but are not latency-sensitive as they send data only once in a month and a few minutes' delay would not cause a problem. On the contrary, security surveillance and connected cars, would require a different level of QoS on a real-time basis and with sufficient bandwidth.

3. Further, TSPs will have to decide the priority of M2M mobile traffic in case of network congestion. For example, seismic sensors need to be able to warn against earthquakes, even in the event that the earthquake results in network congestion. Patients with a heart-monitoring device would also want their devices to have a much higher priority than other data traffic.

4. Therefore, the QoS/SLAs of M2M should be flexible, left to mutual agreement between customers and TSPs and based on the use case (instead of on bandwidth), as prescribing standard QoS norms for M2M will be very complex and difficult to monitor. TRAI should follow a light touch approach to QoS with respect to M2M/IoT and allow the customers and TSPs to come to a mutual decision (as is being done for enterprise services).

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?

Airtel's Response:

N/A

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

Airtel's Response:

We request TRAI to also consider the following at the time of recommendations:

1. While offering M2M/IoT services, traffic management and prioritization will be required. For example, the prioritization of traffic for critical points in a smart grid will have to be done by TSPs in case of congestion. Applications that require service prioritization include drone technology, self-driving cars, and health monitoring. Therefore, it is critical that innovative M2M mobile services, including their pricing, are not caught up in the 'unintended consequences' of net neutrality regulation preventing TSPs from traffic management and prioritizing traffic. Therefore, M2M should be kept out of the purview of any net neutrality principles and regulation to foster its growth and innovation.

2. The impact of 5G technology on M2M/IoT is not covered in the consultation paper. 5G will have network-slicing, which will allow differential QoS. Narrow Band-IoT (NB-IoT) needs to be the area of focus as this is the standard that mobile operators are comfortable with (licensed spectrum); most chipsets are likely to adopt this as well as 5G standards. NB-IoT is a standards-based LPWA technology developed to enable a wide range of new IoT devices and services. NB-IoT significantly improves the power consumption of user devices as well as the system capacity and spectrum efficiency, especially in deep coverage. A battery life of more than 10 years can be supported for a wide range of use cases. We request that TRAI work towards this to enable Indian TSPs to advance and encourage network rollout on new technology.

3. We suggest that TRAI should facilitate a regulatory framework, which mandates 3GPP standards for M2M devices. In the past, we have found that certain M2M devices that have not been manufactured as per 3GPP standards can behave in an unexpected or rogue fashion, leading to issues such as signalling storms. In such events, we recommend that the TSP should have the flexibility to bar such SIMs without any prior notice and with no liabilities thereof.