



RSM/COAI/2016/205

September 30, 2016

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Subject: COAI submission on TRAI Consultation Paper on 'Review of network related Quality of Service standards for Cellular Mobile Telephone Service'

Dear Sir,

This is with reference to the Consultation Paper on "Review of network related Quality of Service standards for Cellular Mobile Telephone Service" issued by TRAI on August 5, 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



Response to TRAI Consultation Paper on Review of network related Quality of Service standards for Cellular Mobile Telephone Service

I. Preamble

1. We thank the Authority for giving us the opportunity to respond to the consultation paper. The Consultation Paper discusses various 'network parameters' and the consumer perception or experience while using the telephony services. However, this Consultation Paper does not discuss the very basic building blocks of wireless technology, under what dynamic conditions it works (laws of physics etc.), what is the complexity for designing, deploying and maintaining a wireless network. Further, various policy, regulatory, legal and other issues which need to be resolved in India have also not been discussed in Consultation Paper, so that the best of network quality (to the extent practically possible) can be delivered to consumers.
2. The objective of the consultation paper, as it seems, is to review the QoS Standards for the telecom services without discussing any of the relevant 'wider factors' that impact the QoS. The consultation on the QoS without any discussion on the related issues is incomplete. Like in the previous occasion of Call Drop Regulation, TRAI has again floated a Consultation Paper without taking into consideration our previous submissions on the issue of Quality of Services without giving any material or evidence to deal with or counter our previous submissions related to Telecom Infrastructure issues, policies and various external & other factors that impact telecom QoS. We, hence sincerely submit that this present consultation is incomplete since our previous submissions have not been taken into consideration.
3. We request that before any parameter or benchmark is fixed by TRAI, it should first examine the present status of the Networks and its limitations, factors within and beyond the control of the Operators; how these impediments can be removed; that TRAI should first make recommendations / take steps for removal of such impediments and then fix parameters / benchmarks. The ground realities needs to be considered and it should not be done without adequate determining principle, not founded in the nature of things. We feel that while attempting to identify weak links (refer page 5 of Consultation Paper) in the Network, the TRAI should suggest means and take steps to strengthen these alleged weak links also.
4. By TRAI's own admission at page 15 in para 2.25 regarding Call Drops in the Consultation Paper, that "Failures in coverage, problems with the quality of the signal, network congestion and network failures impact this parameter. This parameter is also affected by inadequate coverage, problems with the quality of the signal and voice

including interference, radio access network congestion”, therefore, mandates examination of each of these and the reasons / impediments causing each of these and steps taken to rectify the same before fixing benchmarks afresh. We humbly request that without first identifying the issues / problem areas, TRAI should not pose questions like creating sub-sectors etc. We respectfully, submit that TRAI has not given any material or proper information to support any contents or suggestions in this Consultation Paper.

5. We would like to add that if TRAI disagrees with our submissions or any part thereof then TRAI should grant us a detailed personal hearing to address our concerns.

A. Investments made by Indian Operators

1. TRAI has relied upon Supreme Court observation that it has vast powers under the TRAI Act, to ensure, in a reasonable and non-arbitrary manner, that service providers provide the necessary funds for infrastructure development and deal with them so as to protect the interest of the consumer... (Page 61 para 40).

This observation was made in the context of TRAI’s argument that the Operators were not making enough investments in the Network.

2. We would like to submit here that telecom operators have so far invested in excess of Rs. 850,000 crores in their networks. Without these huge investments in acquiring spectrum and deploying network infrastructure with state of the art technology, it would not have been possible to reach an overall tele-density of around 83 percent in the country. The Telecom operators have committed Rs. 290,000 crores to acquire spectrum through auctions since 2010. Without this huge investment the orderly growth of the Industry would have not been possible at all. Some of the salient features on the Indian Telecom sector are:
 - a. Lowest voice tariffs in the world;
 - b. Provision of service in Urban, Rural and Hilly areas;
 - c. Over **500,000** villages covered;
 - d. Among the highest contributors towards FDI in the last decade;
 - e. Among the highest contributors to the Government in terms of fee, taxes and levies – nearly Rs. 70,000 Crores per annum;
 - f. Contributes 6.1% of the Gross Domestic Product (GDP);
 - g. 2nd largest private sector investment in infrastructure – **Rs. 850,000 crores**, despite a Return of Investment (RoI) of <1%;
 - h. Operators are under high debt and the overall industry debt stands at 380,000 crores;

Therefore, we submit that the observation by TRAI that operators have not invested in networks is misplaced and the reliance on the said observation for floating the consultation paper is not appropriate.

3. Also Supreme Court observation is in the context of encouraging necessary funds for infrastructure development and that too in a reasonable and non-arbitrary manner, but not in a negative manner of forcing investment. Such observation has to be seen in the proper perspective.
4. It should also be noted that investments have co-relation with the technical and other aspects of the matter also and cannot be seen in isolation. We submit that TRAI should act as a facilitator instead of adopting an approach saying that “the benchmark should be so arrived at that it could be achievable and also it should force a service provider to invest in infrastructure and improve the service” (page 9-10 para 2.6). It is suggested that instead of an adversarial process a collaborative approach is required for constructive results.

B. Steps being taken by Indian Operators to improve QoS

1. In continuation from our points regarding the investments made by TSPs in their network, we would like to mention various other steps being taken by operators to improve QoS in the country, a point which has been submitted by TSPs earlier as well. Some of the steps being taken by the operators are:
 - a. **Deployment of additional BTSs:** In the **last 12 months**, about **four lakh BTSs** have been deployed to cater to the rising demand for voice and data. The installation of additional BTSs of different technologies has enabled the industry to increase the capacity for voice and to offload the data traffic onto 3G and 4G network. The same has been made possible due to the consistent investments by our member operators in their networks.
 - b. **Technology:** From GSM to HSPA to LTE; endeavor of the Industry is to deploy technologies which make efficient use of spectrum, while also supporting the masses who cannot afford to buy smartphones. This has enabled the access for Indian consumers to most advanced technologies available in the world.
 - c. **Optimization Efforts:** In line with the international standards, Indian operators have been deploying the advanced optimization technologies like AFP (Automatic Frequency Planning) / PSC (Planning Scrambling code), Active Probes to measure & improve customer level experience, Features like OSC (Orthogonal Sub Channel) / VAMOS, TRHO (Traffic based handover) / SBHO (Service based handover), Self-Optimizing networks, various analytical tools to proactively resolve issues (customer experience management) and have vigilant monitoring of the networks with the automated tools. Many of the Operators have set up finest Network Operation Centers (NOC) with hundreds of analytical tools and monitoring facilities to manage the networks. Further, in the **last one year itself**, around **3.85 lakh BTSs** have been

optimized for better performance by our member operators for efficient utilization of resources.

- d. **Upgradation of existing sites and network elements:** To support new features and optimal utilization of telecom infrastructure, our member operators have been constantly upgrading their network elements which include both core and access network. The new features are being incorporated as and when they are available (for release) to improve the customer experience.

C. Feasibility of maintaining QoS

In light of earlier submissions on the subject of QoS, increasing the granularity for maintenance of the QoS levels is not tenable as the parameters are to be judged for the network as a whole i.e. at a LSA level.

There are also other aspects to be considered as QoS depends on inter-alia two broad factors

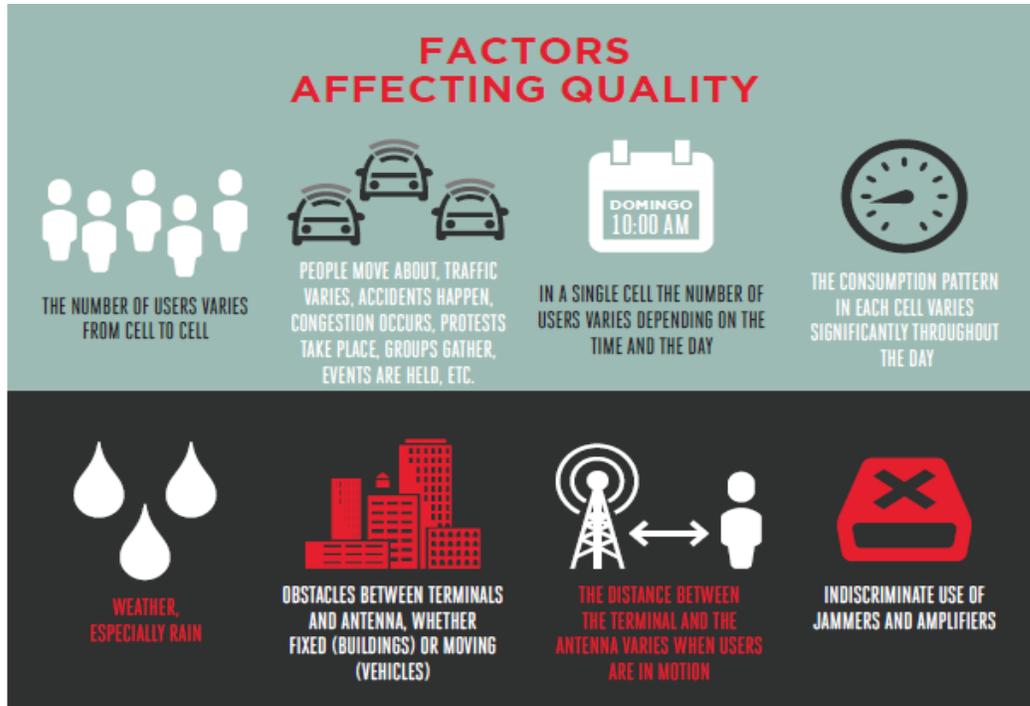
- Technological limitations
- Enabling regulatory and legal Policies

1. Technological Perspective

The various factors which were mentioned in our earlier submissions on Call Drop Regulation are again listed in the figure-2. The mobile networks use airwaves or electromagnetic waves (as called in the scientific terms) to communicate over the air interface to end users or to be precise with mobile handsets. The electromagnetic wave propagation through the environment is governed by 'laws of physics' which are the natural laws that cannot be overcome completely by any technology invented by human beings. The Wireless technology unlike Wireline technology functions under a challenging external environment like natural barriers, man-made barriers, interference from various objects, etc., as the wave propagation takes place on the wireless medium. The factors cannot be controlled in the time and space domain. For example the density of buildings, vehicular traffic, population density, Hilly Terrain etc. is not uniform across a city, district or even a LSA. Due to the inherent challenges in the wireless technology itself, the level of challenges for maintaining QoS at different areas with different characteristics as mentioned are different. Thus, maintaining the same level of QoS at every place would encounter different level of difficulties. **Therefore the performance of a network can be judged only at a network / LSA level as a License for operating a cellular mobile service is granted on a LSA level.** It can be safely assumed that over a LSA the impact of these external factors or limitations would be averaged so as to arrive at a true quantitative judgement about the network's performance. Some of these technological limitations were mentioned by us in our earlier submissions, acknowledged

by TRAI in its technical papers (2015) and have even been mentioned in various international studies. One such GSMA study has been mentioned in the figure-1.

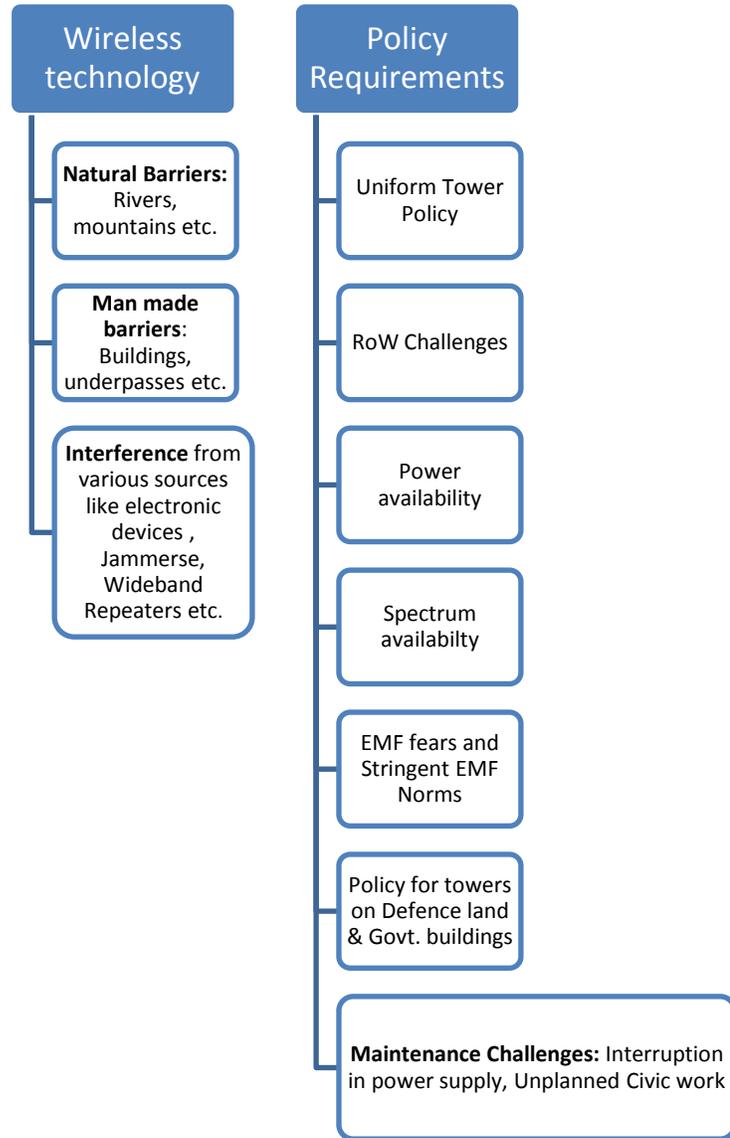
Figure 1: Factors affecting quality: Published in GSMA report (2015) on Mobile QoS in Latin America



2. Policy Perspective

In the past also, TSPs have been voicing the concerns regarding the various impediments in India which restrict the deployment and maintenance of telecom infrastructure. So, even if two places have similar characteristics in terms of natural barriers, man-made barriers and various sources of external factors even then maintenance of uniform QoS due to such and other reasons is a challenge for a TSP if there are no uniform enabling policies with respect to the deployment of telecom infrastructure. As listed and mentioned in Figure-2, in India, there are various impediments as far as stringent EMF parameter, RoW, installation of towers etc. is concerned. **Therefore, in absence of enabling and uniform policy it is submitted that it will be completely arbitrary to fix QoS at the granular level below the LSA.** Any regulatory steps must be anchored in true ground realities and not on hypothesis.

Figure 2: Technology and Policy Perspectives for deciding the granularity of QoS Parameters



D. Supreme Court observations in Call Drop Matter

1. We would like to submit that the facts mentioned above in Figure-2 should not be ignored by TRAI while coming out with the Consultation on Quality of Services for Telecom Services. It would not be out of place to mention the Honorable Supreme Court’s following observations on the Call Drop Regulation:
 - a) TRAI must ensure that its means are as pure as its ends. (Page 59 para 39)

- b) A Regulation framed by TRAI should be 'Reasonable' i.e. framed with intelligent care and deliberation i.e. choice of a course which reason dictates and that the Regulation must be the result of that reason. (Page 50 para 29)
- c) That while public interest is important but it is not enough that the Regulation is in the interest of general public alone. (Page 51-52 para 31) That a balance must be achieved for orderly growth of telecom sector between protecting the interest of consumers as also of Service Providers. (Page 46 para 24)
- d) And that principles of natural justice needs to be followed. That Section 11(4) requires TRAI to ensure transparency, and therefore not only a consultation process must be carried out but that there should be discussion and reasoning also dealing with arguments put forward by Service Providers. (Page 82 para 66)

Therefore, it is submitted that it would be unreasonable and arbitrary to mandate QoS parameters without taking into consideration the submissions made by TSPs regarding external factors, beyond their control, that impact QoS submitted earlier during the Call Drop Regulation Consultation Process; carrying out a true and correct discovery exercise, analyzing and examining the relevant material and data so collected and then applying the same on vast Indian scenario.

E. QoS maintenance – Market and Consumer Empowerment perspective

In India, consumer is empowered as far as telecom services are concerned; some of the enabling factors are:

- 1. Hyper-Competitive market:** Indian Telecom market is hyper competitive with an average of 7 mobile operators in every circle. The evidence of the hyper-competition lies in the fact that the Indian Telecom sector has been able to provide the most affordable mobile telephony services to the consumers than anywhere else in the world. The entry of MVNOs in the market is set to intensify the hyper-competitiveness in the market. Thus, consumers have ample of choices to make their decision regarding the choice of Telecom service provider. In such a scenario, no telecom operator would like to lose its market share to others on account of inferior QoS. Therefore, market forces will always lead to self- regulation as far as QoS is concerned.
- 2. Mobile Number Portability:** To enable consumers to freely switch their mobile operator while retaining their mobile numbers, the Mobile Number Portability (MNP) is available to consumers. The consumers in India have been freely exercising their right to use this facility to switch operators. The MNP system in India has matured and has evolved into a robust system. Thus, there is no barrier that restricts consumers to exercise their right to choose the mobile operator, which they feel is best suited to fulfil their requirements in terms of QoS, service requirements etc.

3. For example forbearance in tariff has helped the market to grow in the interest of consumer; too many unreasonable restrictions therefore are always counter-productive.

Therefore, the case for defining stringent QoS norms is irrelevant in the Indian scenario as market forces and consumer empowerment will always lead the TSPs to maintain acceptable QoS in order to retain and grow their market share.

However, having made the above submissions we sincerely believe that consumers deserve good Quality of Services for which enabling policies need to be enacted for the deployment of Telecom Infrastructure as highlighted from time to time and have been summarized in Figure-2.

4. **QoS parameters for OTT players:** TRAI has sought the comments on QoS related parameters of wireless network whereas no QoS parameters have been set so far for OTT voice communication services. Since over the last few years, the OTT voice services are being used extensively, any rule applied on cellular network should be equally applicable to the OTT services as well for a level playing field and in the spirit of “Same service, same Rules”

F. International Benchmarks Study

1. The Regulators around the world have adopted different approaches in defining the QoS measurement. We would like to highlight a few examples here

a. Sri Lanka:

The Draft QoS Regulation states that the operators have to maintain the following KPIs

- Call Drop Rate: <5%
- Call Set-up Success rate > 95%
- Network Availability : >99%
- Pol Congestion <=0.5 %

b. Colombia:

- Percentage of dropped calls by area : <3% for densely populated area; <6% for other areas
- Availability of network elements: >90% in a monthly period

c. Malaysia:

- Call set up Success Rate > 95%
- Drop call rates: (a) At designated routes: 2% (b) At other routes : 3%

d. South Africa

- Drop Call Rate: < 3%
 - Call Set-up Success Rate > 95 percent
- Measurement is done across the province.

e. United Kingdom

No mandate on Network QoS parameters by Regulator for Mobile Telephony.

f. Canada

No mandate on Network QoS parameters by Regulator for Mobile Telephony.

g. Australia

Follows a self-regulated model for mobile QoS.

2. As per the above, we can see that most of the Regulators around the globe have adopted light touch Regulatory Approach towards maintaining QoS for the mobile telecom services. It may be noted that some of the Regulators, citing the competitiveness in the market have relied on the fact that the market forces can best force the TSPs to maintain QoS in order to sustain in the market.
3. Moreover, some of the QoS benchmarks in India are stricter than what ITU-T guidelines recommend. For example, ITU-T guidelines state there should be less than 3 percent call drop rate. In the Indian scenario we are already following a more stringent benchmark of less than 2 percent call drop rate.
4. We would like to submit that the QoS Regulations in various countries are determined from various factors such as competitive intensity in market, enabling policies etc. **We sincerely believe that keeping in mind the competitive intensity and the state of enabling policies with respect to telecom infrastructure in India, there is no case for defining more stringent QoS parameters. Instead, various policy initiatives need to be taken in order to facilitate improvement in the QoS of Telecom Services in the country in form of enabling policies with respect to release of more access spectrum and ease of telecom infrastructure deployment.**

Summary Submission:

- 1. Indian TSPs have invested in excess of Rs. 850,000 crores in their networks and this has enabled the orderly growth of the sector thereby increasing the mobile tele-density in the country. Therefore, the observation by TRAI that operators have not invested in networks is misplaced.**
- 2. Wireless networks are impacted by various external factors, beyond the control of TSPs, which cannot be completely compensated by any Technology, no matter how much advanced it is.**
- 3. Further, various policy changes with respect to facilitating RoW and deployment of telecom infrastructure are required to be initiated and implemented to further improve the QoS of Telecom Services.**
- 4. There is enough competition in the telecom sector and consumers are empowered as far as making choice of Mobile Operators is concerned.**
- 5. International Benchmarks study suggests that various Regulators have adopted light touch measures as far as Mobile QoS is concerned.**
- 6. Therefore, we believe that presently no case is made out for defining more stringent Network QoS parameters for Mobile Telephony Services, instead various policy initiatives need to be taken for the ease of deployment of telecom infrastructure to further improve QoS of mobile telephony services in the country.**
- 7. Our submissions to query wise response are given below in the part II of our response.**

II. Issue wise response to the Consultation Paper

Question 1: In case QoS is mandated at a sub-service area level, which option (LDCA-wise or District Headquarter/ city/ town-wise or BTS-wise) you would recommend? Please comment with justifications

As submitted in our preamble, wireless Networks operate under challenging and varying external conditions. The granularity of level at which QoS can be maintained depends two broad factors:

- 1. Technological Limitations:** Unlike the wireline networks, the medium of propagation for the wireless networks are the electromagnetic waves. The propagation of electromagnetic waves is governed by 'laws of physics'. The laws of physics state that the wave propagation through the wireless medium is impacted by various external factors like presence of natural barriers, presence of man-made barriers and interaction with other objects like vehicles etc. These factors have been explained in detail in our preamble. We therefore believe that maintaining same QoS is practically impossible in the wireless networks.
- 2. Policy related issues:** Telecom infrastructure is the backbone for any telecommunication technology. It is imperative to have enabling policies to facilitate unhindered, fast and cost effective installation, operation and maintenance of telecom infrastructure. Unfortunately, in India, a country which is looking forward to a Digital revolution through various Government initiatives like Digital India, smart cities etc., TSPs still face challenges with respect to installation of mobile towers, right of way for fiber cable laying. The misleading rumors about EMF radiation are being spread by some elements in our country, has resulted in sealing of sites even after adopting ten times stricter norms than what is considered to be safe by International bodies with respect to EMF radiation. The other factors such as paucity of access spectrum for cellular networks have been listed and explained in our preamble. In the absence of these enabling policies, TSPs are facing challenges in acquiring sites to deploy towers in critical areas, in obtaining RoW for laying fiber cables etc.
- 3. International Benchmarks Study:** We have already highlighted various International examples in the preamble of our response which suggest that Regulators in various developed nations have adopted in light touch Regulatory measures or have prescribed no parameters for Mobile QoS.

In light of above, it is a challenge to maintain uniform quality of services in all the parts of LSA as various factors are beyond the control of operators. Therefore, we submit, that taking average of all these parameters at LSA level is the only way to measure the QoS offered by a network. Any other method will give distorted picture, will be arbitrary and not founded on ground realities.

Question 2: How should the call drop rate calculated – either at the Licensed service area level calculated during TCBH, or calculated during the Cell Bouncing Busy Hour (CBBH) at BTS level should be the benchmark? Please give your views on each parameter, with justification.

Our Submission:

1. As submitted in our response to Question 1 and our submissions in the preamble, we would like to state that QoS of a network can be judged at a network or LSA level only.
2. In line with the same, QoS of a network should be measured at that time of the day when the demand for the network resources is maximum which remains consistent over the days.
3. On the other hand, Cell Bouncing Busy Hour may vary drastically with various factors like sudden movement of subscribers, any outage in the neighboring sites, traffic jam, other high footfall events etc.
4. The TCBH is the true representative of the network's performance as during the TCBH, the network is loaded with the maximum traffic for the day. It is during the TCBH that all the resources of the network (not just a few cells) are under the load which is more than any other time of the day. Thus, TCBH accounts for the network performance as a whole not just for a particular cell.

Therefore, we submit that QoS parameters should be measured at TCBH only.

Question 3: How should the benchmark for the parameters be revised? Should it be licensed service area wise or district wise or BTS-wise or a combination? In such cases what should be the benchmarks? How should the benchmarks be measured? Please give your views on each parameter, with justification.

Our Submission:

Please refer to our response to Question 1.

Question 4: How could the network parameters be technology agnostic? What are the parameters and benchmarks that are required to be defined? Please give your views with justifications.

Our Submission:

1. The Mobile Telephony (Voice) can be delivered over various technologies such as 2G, 3G or 4G etc. The voice services provided under various technologies provide similar features and hence there should be technology agnostic network parameters for measuring quality of voice services provided under these technologies.

2. It is important that parameters prescribed are realistic and fair and thus help in taking any corrective action (if required). In this regard, we would like to submit that the current methodology which is used to derive the parameter Worst affected cells having more than 3% TCH drops does not serve the purpose of representing a realistic performance and provides no output in form of a corrective action required to be taken by the operator.
3. As per the current method for the calculation of this parameter, if a cell which had >3 % TCH drop rate at CBBH even for a single day of the month would account for 'worst cell' average calculation which would not be a correct representative of the actual scenario especially if the affected cell's performance subsequently improved over the next few days. Additionally, this will also not provide any actionable information to the operators as the list of such cells may keep on changing day to day. Thus, we firmly believe that it is prudent to revert back to the old method for calculation of this parameter wherein each cell's drop call rate was calculated over an entire month to determine if the cell is defaulting or not. The same was a much better method which used to highlight cells that actually performed poorly.
4. Further, the measurement results viz Network Availability, Accessibility (Call Set-up Access Rate), retainability (Call Drop Rate) should be calculated for all technologies providing the voice services in the country. In this regard, the following parameters may be measured for various technologies:

Network Service Quality Parameters	Measurement Criteria	Average over a Period
BTS/NodeB/eNode-B downtime	<=2%	One Month
Worst affected BTS/NodeB/eNode-B	<=2%	One Month
Accessibility		
Call Set Up success rate (2G, 3G, 4G)	>=95%	One month during TCBH
Signaling Channel Congestion (SDCCH - 2G, RRC -3G, RRC-4G)	<=1%	One month during TCBH
TCH or RAB or Bearer Congestion		
Retainability		
Call Drop Rate (2G, 3G or 4G)	<=2%	One Month during TCBH

Worst affected cells having more than 3% TCH Drop Rate	$\leq 3\%$	Needs to be reverted back to old methodology as per above submission (DCR averaged for 30/31 days for each cell in CBBH) : One Month
connections with good voice quality (2G, 3G , 4G)	$\geq 95\%$	One Month during TCBH

Question 5: Do you think it is essential to mandate the TSPs to set the RLT parameter? If so what should be the criteria to set the value and the value that needs to be set. Please comment with justifications.

Our Submission:

1. The technological features have been developed within GSM which try to optimize the use of network resources and provide the best possible experience to the consumers. Thus, the GSM technology has been developed in such a way that there are various configurable parameters that decide how a network should be tuned or optimized as per the available resources in various situations.
2. The technology standards are written keeping in mind that the mobile handsets have to deal with various variable and dynamic factors such as sudden or regular movement of subscribers from one place to another having different clutters, radio propagation characteristics, fast fading, shadow zones etc., density of subscribers, site topology within the region etc. This is exactly the reason why these standards have allowed for tuning of parameters as per the prevailing conditions.
3. RLT is just one of the parameters for optimizing customer experience (defined in the Clause 5 of GSM/3GPP standard TS 05.08) which decides for how long the call should be sustained if signal loss quality drops momentarily (say due to multipath fading at any particular instance of time). The call disconnection due to a momentary loss of signal is considered as undesirable due to the inconvenience caused to the customer on account going through the process of redialing the number. The same was recognized by the standard governing bodies like ETSI/3GPP while writing the standards for GSM technology.
4. Thus, tuning of RLT & other similar parameters is done to enhance customer experience. This is done on a case-to-case basis for every cell. Such parameter configuration takes place in all networks. The 3GPP/GSM standards are governing rules adhered by every handset manufacturer and network operator around the world. 3GPP/GSM standard governing bodies have designed parameters such as RLT (and other similar parameters) as variable, within a range, for facilitating the optimization of networks for the purpose of improving the customer experience as wireless planning is a complex process.
5. Thus we sincerely submit that RLT is just a configuration parameter amongst thousands of other configuration parameters to counter various dynamic adverse conditions and

thus in the best interest of the TSPs being able to optimize their networks for delivering good quality services, it should be kept out of ambit of Regulatory framework. To the best of our knowledge, it has not been mandated by any Regulator in the world to set only in the range prescribed by it. Thus, it should be left to the standard governing bodies like 3GPP/ ETSI / ITU-T to decide on these parameters

Question 6: Do you think it will be appropriate to calculate call drop rate through CDR meta data analysis? If so, what should be the benchmarks for such call drop rates calculated. Please comment with justifications.

Our Submission

1. The purpose of Call Detail Records (CDR) is for billing purposes only.
2. Further, we would like to submit that CDRs generated in switch from different vendors have different levels/granularity of information available.
3. Also, with respect to the Call duration nothing can be conclusively deduced as call duration varies as per the context of a conversation and cannot be pointed as directly related to instance of poor voice quality. The Call duration can thus vary from a few seconds to those in hours. The metrics such as call duration may also depend on customer behavior (conditions such as conserving talk time in case of low balance which may result into a shorter call duration than usual).
4. There are no separate Cause Codes available in CDRs for all type of drops. In addition, Call Drop Rate calculation through CDRs may not give figures of actual scenario since cause codes generated through abnormal termination may have cases of intentional/unintentional call disconnect like mobile handset got switched off, battery drained, customer moving to an underground Metro Station/Building etc.
5. **Therefore, Call Drop rate cannot be calculated from CDR meta-data as the same has been not been devised for this purpose. For the purpose of Calculation of Call Drop Rate only Network Statistics can be relied on, which is the current practice.**

Question 7: Do you think calculation of customer satisfaction index will help in QoE of the consumer? If so elaborate the methodology of the calculation of such indexes. What are the latent variable that need to be defined and how are they to be calculated? Please comment with justifications.

Our Submission:

1. The Quality of Experience measurement is a subjective representation as the same varies with the expectation of the consumers. Two consumers would have a different perception and expectation of Quality of Services for the Telecom Services. Consumer

perception is affected by various factors such as awareness, experience, media, social media etc.

2. On the other hand, QoS parameters are quantitative in nature which are calculated from the actual data and thus represent a true picture of a network's performance.
3. In continuation to the above, the customer cannot decisively differentiate between any problem arising due to the terminating network's problem or the network serving the customer. Therefore, the result arising out of this calculation would be very subjective in nature depending on various conditions and will give anomalous results.
4. Therefore, we believe that the parameters and indices suggested by the Authority in the Consultation Paper cannot be used to decisively conclude upon QoS offered by TSPs.

Question 8: What are your views on introducing a graded financial disincentives based on performance and what should be such quantum of financial disincentives for various parameters? Please comment with justifications.

Our Submission:

1. The biggest Financial Disincentive for any service provider for not so good QoS would be loss of market share; in a market which is highly competitive and provides most affordable services in the world. Therefore, the case for financial disincentive for any TSPs for rendering not so good QoS already exists in form of market forces as there are abundant choices for the customer. Therefore, there should not be any financial disincentive for the TSPs in case the QoS benchmarks are breached.
2. We believe that financial disincentive has not contributed in either increasing investments or improve quality of service because it cannot. Operators have been making extensive investments continuously in their Networks and therefore it is submitted that Financial Disincentive has no nexus with the objective of increasing investments or quality of service. Further, we believe that it is a misguided approach.
