

## **Annexure A**

### **Idea Cellular Response to**

### **TRAI Consultation paper**

**on**

### **"Review of network related Quality of Service standards for Cellular Mobile Telephone Service"**

#### **Preamble:**

Indian telecom currently has over a Billion consumers connected on voice telephony, a revolution that has been made possible by a very competitive industry that has built large scale telecom networks through innovative business models, supported by clarity in regulatory framework, large investments by TSPs, ability to attract investment, amongst others. This has spurred innovation and customization of solutions in the market.

**In fact all the benefits that can come from effective regulation, such as economic and technological growth, increased investment in the sector, cost reduction with improved efficiency, better quality of service, improved customer satisfaction, affordable prices delivering better value for money and improved access and availability of services, have got delivered under the prevailing Light touch regulatory regime of TRAI.**

The Authority would further appreciate that the Indian wireless industry, especially the private sector, over the last two decades, has perhaps built the finest and widest services infrastructure in form of a mobile voice highway which today connects over 5 lac towns and villages across 550 districts including deep rural interiors and hinterlands across Bharat. This infrastructure, entailing investments of over Rs. 8.5 lac crores, is the backbone that delivers high quality voice services to over 1 billion Indians today, catapulting India to the 2nd largest mobility country in the world in terms of number of mobile users, and generating over 10 billion voice minutes on a daily basis. The sector is a vital driver of the country's GDP and has contributed nearly 3% directly to the economy over the last decade.

Thus, it is imperative that TRAI regulations focus on setting up QoS benchmarks that spur further mobile growth and investments in the sector, while balancing the need to provide world class services to

consumers. The TRAI has itself noted in the consultation 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.

Further, you would acknowledge that the TRAI Act, as **amended by the 2000 Act, clearly casts the responsibility on TRAI to protect the interests of service providers and consumers alike, so that the orderly growth of the telecom sector is ensured thereby. This was also reiterated by Hon'ble Supreme Court in its call drop Judgment.**

The TRAI has highlighted that the reason for issuing this CP is to deal with the moot question of ensuring the QoS so that the customers may not face the kind of inconvenience which prompted the Authority to take measures for compensating the consumers through its earlier “Telecom Consumers Protection (Ninth Amendment) Regulations, 2015 (9 of 2015)” issued on October 16th, 2015.

**We would like to submit that the TRAI Consultation Paper has somehow again failed to recognize the related issues and external factors beyond the control of Telecom operators such as non-availability of sites at various locations in a city environment, abrupt site sealing by Municipal Authorities and rabid action by Resident Welfare Associations on site shut-down. The existence of such factors has already been acknowledged by the TRAI in its “Technical Paper on Call Drop in Cellular Networks” of 2015, as mentioned below:**

*“In light of the reasons discussed in the Paper, about the increase in call drops, it must be realized that mobile towers do not have an unlimited capacity for handling the current network load. There is an urgent need to increase the number of the towers so as to cater to the demands of a growing subscriber base. At the same time, problems like removal of towers from certain areas by Authorities should be adequately addressed. This problem is particularly evident in urban areas.*

**Hence we would request the Authority to consider the above issues as an integral part of QoS discussion.**

Our summary comments on the consultation are as under:

## I. Investments made by Indian Operators

- a. It is submitted that the TRAI has in the current CP referred to its earlier observation from the Consultation on “Compensation to the Consumers in the Event of Dropped Calls’ issued on the 4th September, 2015 wherein it was highlighted *“that the service providers are not making adequate investments so that the QoS is maintained”*... The Authority has further highlighted the following as an option to deal with the above question, *“One of the options for ensuring QoS could be through increased investments for infrastructure development by redefining the parameters & benchmarks and measurement methodology...”*
- b. In this context, we would like to submit that telecom operators have so far invested in excess of Rs. 850,000 crores in their networks. Most of this investment in equipment is also recent with large investments made to expand coverage to deep corners of the country. Having committed Rs. 60,000 crores in the February 2014 auctions, the Indian wireless operators have invested an additional Rs. 1.1 lac crores during the March 2015 auctions for spectrum acquisition. In addition to the high investments for spectrum procurement, the mobile telcos continued to invest significantly in network optimization and installation of new sites to improve coverage and capacity. In the Financial Year 2015-16, the top 3 operators alone invested nearly Rs. 30,000 crores in capital expenditure for network expansion – a level nearly double of their past four year average. With such massive investments during the course of the year, the cumulative gross block in the sector crossed Rs. 8.5 lac crores mark. In fact, the scale of investments committed in FY16 has been unprecedented with the industry ploughing in one-sixth of the cumulative investments in the sector till date in a single year alone.
- c. It needs to be considered that without these huge investments towards acquiring spectrum and deploying network infrastructure with state of the art technology, it would not have been possible for the country to reach an overall tele-density of around 83 percent. These massive investments made in the sector have been financed through a combination of equity and debt. It also needs to be noted that while telecom sector remains among the highest Foreign Direct Investment sector for the Government of India, and private sector promoters have made heavy equity commitments, the sector is now facing a ballooning net debt of close to Rs. 4 lac crores.
- d. With increasing spends on spectrum acquisition and higher capital expenditure in the form of network roll outs, much of the costs have shifted to below EBITDA levels. In such a scenario,

ROCE, ROE, Return on Assets and Return on Investment have become more relevant metrics to measure profitability for all telecom investors. **Analyzing the Indian telecom industry with this comprehensive lens reveals that the overall industry continues to realize negative returns (as measured on ROCE & ROE), with even the top 3 operators making only single digit returns.** Despite these negatives, the Industry is willing to put in investments with support from Indian & Foreign investors who have already committed to investing large funds (nearly Rs. 750,000 crores) with a commitment of stable policy and regulatory regime. **It is therefore particularly surprising that TRAI has still chosen to include this remark in its Consultation Paper which is clearly not based on facts.**

- e. We would like to further submit here that GSM coverage of over 1.3 billion population reaching out to 500,000 towns and villages is ‘National Network’ and misplaced impressions from the Regulator, such as this, have the potential to dent the morale of Indian & Foreign investors who have together committed large funds (nearly Rs. 750,000 crores) with commitment of stable policy and regulatory regime.

## **II. Steps taken by Idea Cellular to improve QoS over the last 24 months and Proposed Steps:**

TRAI seems to suggest increased Investments to ensure QoS. We would like to submit that Idea cellular has already made huge investments to ensure that QoS gets the top priority.

### **A. Capital Investments on Network by Idea Cellular**

Over the last 3 years, Idea Cellular has made the following capital investments in network:

Period	FY14	FY15	FY16	Q1FY16	Q2FY16	Q3FY16	Q4FY16	Q1FY17
Network (in Rs. Cr)	3,568	4,046	7,769	1,367	1,727	2,286	2,389	1,076

**B. Site Optimization Efforts:**

Idea cellular has been continuously investing in focused efforts to improve QoS of subscribers in all its Telecom service areas over the last 2 years. In addition to day-to-day KPI monitoring, below-mentioned are the details of support activities that have been carried out to improve Network QoS:

- a. Comprehensive Drive test (2G, 3G) carried out in all major towns of all 22 Service areas.
- b. 40,500 KMs Drive Test done in last 2 months to capture call drop locations including poor Signal & Quality patches that could lead to call drops.
- c. Location specific optimization activity carried out like Antenna optimization (Direction, Tilts), Neighbor relations optimization, Soft parameter optimization to eliminate call drops probability at respective spots.
- d. Resource planning (Additional sector in existing BTS, New Cell site) aligned to tackle coverage holes / poor quality patches on streets.
- e. Transmission Network Monitoring (Microwave hops interconnecting BTS sites) strengthened to ensure that Call Drops occurring due to Microwave Network performance are eliminated.
- f. Close monitoring of BTS site outages, even of small duration initiated to minimize BTS site outage instances and outage time.
- g. Tracking of Performance-affecting alarms in BTS started on a continuous basis to eliminate call drop probability on account of Hardware performance issues

➤ Below are details of new site rollout and optimization efforts since June 2016

KPIs	Description	Last 1 year - June 2015 to June 2016	Planned over next 100 days beginning June 10, 2016	Progress in 45 days (10th June to 20th July 16)	Progress in 68 days (from 10th June till August 17, 2016)
BTS Addition	BTS Added	48,507	15,500	3,885	9,310
Network Performance	BTS where performance optimized	128,798	48,375	35,260	50,751

C. **BTS sites growth vis-à-vis “Traffic per site” and “Traffic per sub parameter”:**

2G						
	Sites	A - int traffic (KErlang)	VLR (K Sub)	Call drop @ NBH (%)	Traffic per site	Traffic / sub (mE)
Mar'11	73668	2272	81248	1.16	30.8	27.96
Mar'12	83190	2686	103001	1.00	32.3	26.08
Mar'13	90094	3160	116066	0.90	35.1	27.23
Mar'14	104778	3375	131218	0.86	32.2	25.72
Mar'15	112367	3821	149072	0.81	34.0	25.63
Mar'16	126833	3883	163938	0.66	30.6	23.69
Jul'16	128664	3536	162903	0.75	27.5	21.71

The data above shows clearly that BTS sites growth is at the higher rate in last 3 years than “traffic per site” and “Traffic per sub” parameters. Further, as can be seen, the call drop parameter is also showing a clear improvement year-on -year.

Further, the below given table indicates that there is a decrease in “Traffic per site” in July 16 as compared to March 11. This clearly indicates that Network resource utilization has in fact reduced resulting into improved QoS.

2G				Reduction in traffic per site in June 16 w.r.t Mar 11
Month	Sites	Busy Hour Traffic	Traffic per site	
Mar'11	73668	2272	30.8	-
Jul'16	128664	3536	27.5	10.9%

D. **Sites added in last 3 years**

	FY 13	FY 14	FY 15	FY 16
2G	6,904	14,684	7,589	14,466
3G	4,315	4,241	8,910	18,677
4G				14,643
<b>Total</b>	<b>11,219</b>	<b>18,925</b>	<b>16,499</b>	<b>47,786</b>

As can be seen, 47,86 sites have been added in FY 16 alone.

**E. New Projects being Rolled Out:**

Idea has committed itself to rolling out new projects to further improve QoS. Details of the same are as follows:

**a. Self-Optimizing Network (SON) :**

In this, the network auto-reacts to the varying network conditions and load to optimize the traffic across nearby cells of network. This minimizes manual interventions for network corrections. The complete launch for the same is planned by Mar '17

**b. Customer Experience Management (CEM) :**

Here the objective is to manage the customer experience in network for all data services and provide more focused service and response to customer issues proactively. The complete launch for the same is planned by Dec '17.

**c. Performance Management System (PMS) :**

Such a system provides the capability to have advanced analytics on Cell level performance KPIs to be able to capture degradations in near real time & support faster resolution of network degradations. The complete launch for the same is planned by May '17

**d. Geo Location Analyzer:**

The concept of such a system is to be able to identify network health in traffic hotspots and carry out advanced level troubleshooting to enhance the customer experience. The complete launch for the same is planned by Mar '17.

**Basis the above, it can be clearly seen that as a TSP we have been continuously making new investments in our network for superior network performance and faster resolution of network issues.**

**Thus the primary TRAI basis for consultation viz. lack of infrastructure growth, is clearly not corroborated by the actual data submitted above and we request the TRAI to kindly take note of the above, while proposing any changes in the Regulation.**

**III. TRAI regulation on QoS is already very stringent and operators remain fully compliant to the Regulations.**

- a. It is submitted that the TRAI has vide its QoS Regulation, 2009 laid out the parameters relating to network and Service quality. These parameters were laid out after considerable deliberations by the Authority and have been amended from time to time. The Regulation thus covers in detail the parameters related to network call quality.
- b. Further, we would like to submit that Idea Networks are fully compliant with TRAI Regulations and IDEA Cellular is meeting the necessary norms laid down by the Regulator across the country, on network service quality parameters. It is pertinent to mention here that the norms specified by the TRAI are comparable to world standards.
- c. **It is further submitted that Idea Cellular is fully compliant on all QoS network parameters for last 4 quarters.** The Authority has also prescribed disincentive in case the parameters are not being met by the service providers. In this regard, it is submitted that **Idea Cellular has not been levied any disincentive (during last 4 quarters) with regard to deviation of Network QoS parameters.**

**IV. Maintenance and Measurement of QoS at sub-service area level**

It is pertinent to mention that the granularity for maintenance of the QoS levels depends inter-alia on 2 broad factors:

- Technological limitations
- Enabling regulatory and legal Policies

Our submissions with respect to the same are as follows:

- I. **Technological Perspective:** It is submitted that the TRAI's contention that operators are meeting the QoS parameters because of averaging of the performance across service area does not appear to be a just basis for the need to measure QoS parameters at lower granularity level like SDCA, LDCA, District, BTS etc.

We feel that "individual ways" of reporting QoS at lower granularity often result in varying and non-conclusive results. **In fact, under the circumstances wherein a number of dynamic factors of varying intensity are applicable to the Mobile Services spread across large geography , averaging of KPIs over larger time (Month) and Geography (Service area) is likely to provide more robust statistical analysis.** It is further submitted that within a single service area, there is always a varying mix of urban, sub urban & rural areas with varying geographies (hills, water bodies, forests, habitation area, building sizes /densities, population density, etc). **Hence Network KPIs if monitored at any other granularity than Service area level are bound to vary with respect to varying geographies.** TRAI is well aware that the characteristics of different geographies within same service area are varying in nature in terms of Infrastructure (Electricity, Local issues) and operating conditions.

**Further, it is seen that various types of inhibiting factors of different magnitude operate across different geographies within the same service area.** Some areas (few districts) that have poor electricity supply (capacity & availability) have negatively impacted network operations. Many areas (particularly rooftop sites) have limitations such as non-permissibility to run diesel generator in case of electricity power failure. Accessibility of some BTS sites is a major challenge during odd hours of the day. Law & order issues such as "Naxalite" activity, disturbances on account of "Bandh / Hadtal", temporary events like huge public gatherings also affect network KPIs. Such challenges related to infrastructure ecosystem are therefore bound to result in varying QoS at different times in case the QoS parameters are calculated at lower granularity like SDCA, District, etc.

**Considering all these factors, if we reduce the granularity of QoS monitoring from Service area level to any other lower granularity, some entities (geographies) may have better QoS compared to other, solely because of "operating conditions" and not because of factors controllable by service providers. This would thus imply that laying down different QoS parameters for various types of sub service areas, depending upon the characteristics of the particular sub service area would be difficult to achieve based on a few common sets with same operating conditions.**

Further, In addition to monitoring QoS parameters at Service Area level, TRAI has been conducting monthly drive tests across all SSAs of Telecom service areas through its auditors. Over and above TRAI is also doing independent drive test in Major cities of the country. This ensures verification of QoS at reasonably lower granularity

**Further, it needs to be noted that National Regulatory Authorities across most countries monitor QoS at a Service area level only. At the same time, it is pertinent to mention here that the number of Voice QoS parameters being monitored by TRAI is far in excess as compared to those monitored by any regulator in the world with the thresholds for respective parameters being most stringent compared to similar markets from the world.**

- II. **Policy Perspective:** Telecommunications is a basic need just like water, electricity or road and Infrastructure development plays a crucial role in building a robust telecom network. It may be noted that despite DoT August 2013 guidelines, unabated disconnection of electricity supplies, sealing of premises, dismantling of towers by local authorities, artificial restrictions on installing towers on educational institutions, hospitals, defence & forest lands, historical, and even residential areas, and non-adherence to State policies by local authorities on tower application, documentation, fees charges and NOC issuance continues unabated. Further, in respect of Right of Way (RoW) for Fibre, often there are delays in approvals, and frequent fibre cuts because of other infrastructure projects over-riding the RoW rights of mobile operators. In the past, TSPs have highlighted difficulties about restrictions imposed by State Governments and Municipalities on erection of cell-sites in non-commercial areas, existence of difficult and complicated approval procedures requiring complicated clearances to be taken from multiple agencies such as advance clearance from resident welfare associations (RWAs) in case of residential areas, safety certificate, clearance from pollution control authorities and fire authorities, thereby leading to huge delays in implementation of solutions and existence of baseless fears amongst the masses about radiations hazards from towers and mobility solutions that have acted as deterrents for deployment of telecom infrastructure in the buildings, particularly, residential societies. As a result, no two territories are comparable to one another on QoS parameters even if they were similar on characteristics such as geography, size, population, etc.

**The Industry has already highlighted that there is an urgent need to streamline the options and procedures within the legal framework, address all possible impediments to infrastructure rollouts, and come up with a national policy on RoW to facilitate faster growth of telecommunication services in the country.** Such a policy should have a single legal framework for the entire country, and needs to be applicable to deployments across all categories of land to bring about improvements in Network coverage and QoS. **Until such time that a uniform policy is in place, fixing QoS benchmarks at a sub-service area level is not at all feasible.**

### **III. QoS – Licensing / Market and Consumer Empowerment**

It is an acknowledged reality that the Indian consumer is heavily empowered as far as telecom services are concerned. A few of the enabling factors are as follows:

- I. Hyper-Competitive market:** It is already well acknowledged that the Indian Telecom sector is amongst the most competitive in the World, and already has one of the lowest tariffs globally. Further, the entry of MVNOs in the market is also set to intensify the hyper-competitiveness in the market. Thus, consumers have ample choice as regards the selection of their Telecom service provider. In such a scenario, no telecom operator would risk losing its market share to its competition because of inferior network QoS and market forces will invariably lead to self-regulation on the aspect of QoS..
- J. Mobile Number Portability:** It is pertinent to mention here that mobile telephone is today accessible by more than 915 million (active VLR) subscribers across 22 telecoms service areas and covers more than 5 lac villages. **Currently there are multiple telecom service providers and if a customer is not satisfied, he / she has the option to port to an alternate service provider by using MNP. In fact that is the purpose of Regulatory interventions like MNP in which more than 220 million customers have put in their MNP requests until June 2016.** With MNP and Full or National MNP, consumers are no more restricted to remain in any network or service area, if they face poor quality of Network. Hence there is no need for any change in network QoS benchmarks.
- I. Regulatory Intervention desirable only when market forces are not working efficiently:** Idea Cellular submits that Regulatory intervention is desirable only when market forces do not

themselves lead to redressal of issues for consumers. However, intense competition in the Indian mobile telephony segment already ensures that the service providers offer only the best and most competitive services to the consumers, and make all possible efforts to address issues on a prompt basis to prevent customers from porting out to other service providers. In that context, we are intrigued that this Consultation has come in at a time when competition has evolved to a point where customers already have an easy option of porting out to any service provider of their choice. **Therefore, we reiterate that the case for defining stringent QoS norms is irrelevant in the Indian scenario.**

**Briefly stated, the TRAI needs to take note of the following :**

- A. No wireless network technology allows for 100% availability of network at all times, without any call drops.**
- B. The license issued by the licensor viz. DoT, in India and even by other Licensors/ Regulators worldwide take cognizance of the above fact and hence do not mandate 100% coverage at all times or zero percent call drops in wireless networks.**
- C. TRAI regulation on QoS is already very stringent and Idea Cellular remains fully compliant to the Network QoS Regulations.**
- D. We fail to understand the intent for bringing in more stringent benchmarks when the existing regulation is already very stringent, in fact stringent than QoS standards laid down by most Regulators across the world.**
- E. Network Problems such as call drops are localized at few locations in Metro towns and are not a Pan-India phenomenon to warrant new QoS norms.**
- E. Existing TRAI Regulations have mechanism of disincentives in case of not meeting QoS parameters and hence any indirect enhancement in disincentives because of more stringent benchmarks would serve to put extra burden on the already financially burdened operators.**
- F. The factors leading to deviations against QoS benchmarks are not always within the control of the operator and hence consideration needs to be given to such factors.**
- G. Authority has failed to appreciate the actual genesis behind variations in the QoE by customers – Municipality sealing, Right of Way issues, interference issues, etc.**

**H. Adequate capacities and massive investments have been made by operators, more so over the last 12 months, and TRAI concerns on this account are misplaced and invalid.**

**I. TRAI concerns on many areas / localities within the service area where the QoS could be poor, etc. are misplaced and not based on facts. While there could be a few areas where QoS Benchmarks may not be getting met, areas with poor QoS would be only by exception.**

**J. Currently there are a multiplicity of service providers / wireless services, and if a customer is not satisfied, they can port to an alternate service provider through MNP. In fact that is the purpose of Regulatory interventions like MNP in which more than 220 million customers have put in their requests until June 2016.**

**L. Finally, we believe that there is no case for defining more stringent QoS benchmarks. In line with the international best practices, TRAI too should have a light-touch approach for QoS. There is no need to drive it further through more regulatory mandates.**

**In view of the above, we believe and submit that there is no need for TRAI to either redefine the parameters & benchmarks and measurement methodology or tighten the financial disincentive framework, providing for more stringent penal provisions for very poor performance and continuous non-performance (along with incentives for improvement).**

Instead, the TRAI should look at ushering in a proper policy framework that facilitates the deployment of telecom infrastructure and aims at removing all possible impediments at the very earliest. Uniform guidelines for RoW applicable on a Pan-India basis, shall be an excellent initiative to improve Network coverage and QoS.

We now proceed to respond to the queries raised in the consultation paper. However, we would like to first submit that all the relevant issues have been highlighted by us in the introduction / preamble and the same is relevant for responses to each of the questions given below. Thus our comments in introduction need to be seen, discussed and considered by the Regulator, before taking any decision on the subject of this consultation paper.

**Q1: 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**

**Idea Response:**

We recommend that the QoS should continue to be mandated at Service Area level only since licensing is based on Service Area level. Within a single service area, there is varying mix of urban, sub urban & rural areas with varying geographies (hills, water bodies, forests, habitation area, building sizes /densities, population density etc).

We feel that “individual ways” of reporting QoS at lower granularity often result in varying and non-conclusive results. **In fact, under the circumstances wherein a number of dynamic factors of varying intensity are applicable to the Mobile Services spread across large geography , averaging of KPIs over larger time (Month) and Geography (Service area) is likely to provide more robust statistical analysis.** It is further submitted that within a single service area, there is always a varying mix of urban, sub urban & rural areas with varying geographies (hills, water bodies, forests, habitation area, building sizes /densities, population density, etc). **Hence Network KPIs if monitored at any other granularity than Service area level are bound to vary with respect to varying geographies.** TRAI is well aware that the characteristics of different geographies within same service area are varying in nature in terms of Infrastructure (Electricity, Local issues) and operating conditions.

**Further, it is seen that various types of inhibiting factors of different magnitude operate across different geographies within the same service area.** Some areas (few districts) that have poor electricity supply (capacity & availability) have negatively impacted network operations. Many areas (particularly rooftop sites) have limitations such as non-permissibility to run diesel generator in case of electricity power failure. Accessibility of some BTS sites is a major challenge during odd hours of the day. Law & order issues such as “Naxalite” activity, disturbances on account of “Bandh / Hadtal”, temporary events like huge public gatherings also affect network KPIs. Such challenges related to infrastructure ecosystem are therefore bound to result in varying QoS at different times in case the QoS parameters are calculated at lower granularity like SDCA, District, etc.

Considering all these factors, if we reduce the granularity of QoS monitoring from Service area level to any other lower granularity, some entities (geographies) may have better QoS compared to other, solely because of “operating conditions” and not because of factors controllable by service providers. This would thus imply that laying down different QoS parameters for various types of sub service areas, depending upon the characteristics of the particular sub service area would be difficult to achieve based on a few common sets with same operating conditions.

Moreover, licenses being at LSA level, are issued by the DoT & QoS norms are regulated by the TRAI. Further, If we get into the practice of district wise reporting, then the local Government will have a frequent tendency to intervene on local QoS issues, without understanding the issues involved – which only an expert body like TRAI can appreciate. Already, we have seen local Government in several states issuing Directions which are contrary to what the TRAI or DoT orders specify. This situation needs to be avoided.

It may also be noted that the networks are architected for a Service Area and not designed and built on LDCA or District basis. While the Service Area is well defined, any further demarcation is not available in the Network design. The OSS in a Network from which the various KPIs are measured can do so at the Service Area level only as the deployment of the MSC / BSC / RNC do not follow any geographical pattern aligned to the District or LDCA. Further, the architecture / design of the network is different for all operators and based on their traffic requirements.

In the consultation paper (page 9), it is mentioned that “*Further Customer could be aware of the QoS of his service provider in his locality*”. In that context, it is submitted that the definition of locality for an individual subscriber can vary in terms of the unit of measurement. To an individual, it could mean various places such as his residence, neighborhood, village, town, frequently commuted places, etc. However, designing QoS granularity at these levels is practically impossible & undesirable. In any case mobility services are meant to be used by a subscriber at all locations where the subscriber travels and hence one should not make an attempt to ascribe any location to a mobility subscriber.

**In view of the above, we feel there is no need to mandate Sub-service area wise QoS parameters (KPIs) in QoS regulation.**

**Q2: 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**

**Idea Response:**

**It is recommended that call drop rate be calculated at Time Consistent Busy Hour (TCBH) when all types of resources in the network (BTS, BSC, MSC, and Transmission) are loaded to the maximum level during the day.**

Measuring call drop rate at Cell (BTS) level at its individual peak hour (Cell Bouncing Busy Hour - CBBH) for the day will not give a correct representation. For Example, a cell “A” on a given day may have a higher drop value (say 2.5%) at its individual peak hour because of local / temporary issue, which being a dynamic thing cannot be factored at the stage of design / optimization.

Intermittent and unpredictable instances such as a public gathering at events, prayer ceremonies, traffic jams, traffic diversions, mobility dynamics, etc. can impact KPI of a cell / BTS for some duration. Also in case of CBBH logic, there will be many instances where on any given day, a cell shows call drop value of 2.5 % at its individual peak hour, & over the next two consecutive days shows call drop of 1.2 % & 0.8 % respectively. In such circumstances, this cell is not expected to be worked upon for improvement since the incident of crossing drop threshold is mostly due to intermittent & temporary nature of issue/incident.

**Q 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.**

**Idea Response:**

In line with our response to Q 1 above, we recommend QoS monitoring to be maintained at service area level.

TRAI in its consultation paper has captured many cases of **non-compliance by operators** (Page 10 to page 19) on various QoS parameters for Quarter ending 31st March 2016. This naturally goes on to show that the current benchmarks are stringent enough and cannot be met in many cases.

Further, we would like to submit that the benchmarks laid down for various KPIs in the current QoS Regulation are either equivalent or more stringent than the international QoS standards commonly laid down by Regulators across the world. In this regard, please refer to Annexure B.

In view of the same, we submit that there is no need to make the QoS parameters more stringent. In fact some of the KPIs need not be measured. As per our understanding, Individual cell drop KPI is not part of QoS regulation in any country. Instead 24 hour call drop, which is relevant to subscriber experience is a more meaningful KPI that can be monitored.

Desirable modifications in current parameters & benchmarks are captured in table below:

**Suggestions w.r.t. revising benchmark value is provided in table below.**

			Current Benchmark	Idea Cellular comments
1		Name of Service Area / City	-	-
2		Time Consistent Busy Hour (TCBH)	-	-
3		Total no. of BTSS in the licensed service area	-	-
4	Network Availability	Sum of downtime of BTSS in a month in hours i.e. total outage time of all BTSS in hours during a month	-	-
5		BTSS Accumulated downtime (not available for service) (%age)	≤ 2%	<b>No change recommended</b>

6		No. of BTSs having accumulated downtime of >24 hours in a month		
7		Worst affected BTSs due to downtime (%age)	≤ 2%	<b>No change recommended</b>
8	Connection Establishment (Accessibility)	Call Set-up Success Rate (within licensee's own network)	≥ 95%	<b>No change recommended</b>
9		SDCCH/ Paging Chl. Congestion (%age)	≤ 1%	<b>No change recommended</b>
10		TCH Congestion (%age)	≤ 2%	<b>No change recommended</b>
11		Call Drop Rate (%age)	≤ 2%	<b>No change recommended</b>
12	Connection Maintenance (Retainability)	Total No. of cells exceeding 3% TCH drop (call drop)		
13		Total no. of cells in the network		
14		Worst affected cells having more than 3% TCH drop (call drop) rate (%age)	≤ 3%	<p>We suggest need to revisit this parameter. In fact we could not get any reference of BBH drop KPI monitoring under QoS regulation in any other country.</p> <p><u>Option 1:</u> We recommend removal of this KPI and instead a shift to “24 hour” call drop parameter</p> <p><u>Option 2:</u> New logic of arriving at “Worst Cell”</p> <p>**** <i>Details as below</i></p>
15		%age of connection with good voice quality	≥ 95%	<b>No change recommended</b>

16	POI	Point of Interconnection (POI) Congestion (No. of POIs not meeting the benchmark Note :2)	$\leq 0.5\%$	No change recommended
18	Network Traffic Capacity and Utilization	Equipped Capacity of Network in respect of Traffic in erlang		These parameters should be removed from QoS since these parameters do not indicate QoS related information
19		Total traffic handled in TCBH in erlang		
20		Total no. of customers served (as per VLR) on last working day of the month		

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#### Option 1:

We feel that monitoring call drop at a 24 hour (Day) level is a more meaningful & more robust way from the subscriber perspective. 24 hour call drop is most relevant measurement which can capture the subscriber experience in the network for his entire usage time. Also, the peak hour concept is basically related to the Network planning and dimensioning and really has no significance as far as consumer experience is concerned.

#### Option 2:

Proposed logic to define “Worst affected Cell” is as follows:

	Current Method	Proposed logic
1	Calculates cells with > 3 % drop on daily basis & average of daily count for the month is reported.	Cell having BBH call drop > 3 % for 15 or more days of the month will qualify as “Worst Cell”. With this method we will be able to identify consistently poor performing cells (> 3 % drop) and avoid non actionable cells which are appearing on few odd days of the month.
2	Not possible to list down the “worst cells”. Every day cells keep changing because of dynamics involved like offered traffic	We will have clear cut list of workable cells out of this logic. With this logic, focused efforts on definite list of cells will be possible.

	pattern (indoor/outdoor traffic contribution) Traffic load variation (Public gatherings, Events like festivals, Traffic Jams, Sport events, varying radio propagating conditions etc. Hence no workable list can be derived out of this report	
3	This measurement includes cells with very minuscule traffic/ calls compared to typical average traffic and are statistically prone to higher variation of KPI value.	Excluding of such cells (calls less than 100 in peak hour) is proposed in this method since such cells dilute the kitty of actionable cells.

**Q 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.**

**Idea Response:**

The QoS parameters measurement is possible for respective technology (2G, 3G, 4G) individually using OSS counters generated for respective technology. Every Access technology (2G , 3G , 4G) is having different technical standards. 2G is more voice centric with 3G being more data centric and 4G being a pure Data network as launched by most operators in India and globally based on Circuit Switched Fall Back (CSFB). The network elements involved in voice call flow are different in the case of each technology.

Every Technology generates its own counters & KPIs individually like call drop, congestion etc. Logically it is incorrect to combine any KPI (say Congestion), since KPI improvement / optimization activities can only happen for each technology separately and also requirement of actions to be taken for optimization are very different for each technology.

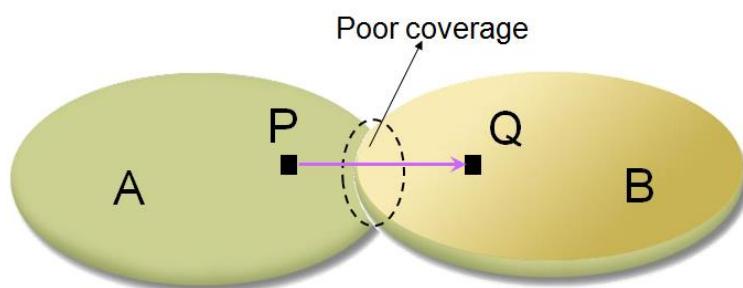
Hence deriving technology agnostic KPIs would not be relevant. It's a standard practice across all OEMs to generate KPIs per technology.

**Q 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**

**Idea Response:**

Radio link timer (RLT) is used by the Network to determine when to disconnect the call upon intermittent failures in decoding the control frames.

RLT is one of the several optimization parameters which can be configured between 4 and 64 based on the RF conditions and clutter type. Broadly, this timer is used to optimize the network. In case it is kept too low, then in case of even a small gap in coverage due to any reason from multiple reflected transmissions or while in the lift, the call would drop immediately and subscriber would have to re-establish the call. The optimization is done so that the timer value is kept such that the call would continue for some time to allow the connection to continue without dropping the call. If all calls are allowed to drop by keeping the timer low, then the customer will not be satisfied and will have to dial again. While if the call is allowed to continue and the other party comes back within a few seconds, then the subscriber would not mind and continue with the call. Since AMR calls are more robust than non AMR calls and provide acceptable speech quality at much lower C/I values, the settings of RLT for AMR and non AMR calls are generally different in networks. Hence RLT values for AMR are set at much higher values than non AMR.



**Impact of radio link timeout**

If cell A and B are adjacent to each other, assume that one customer moves from point P to point Q during a conversation, usually an outgoing cell handover will occur. If the value of parameter "radio link timeout" is too small and the quality of signal at the edge of cells A and B is poor, it is likely that the radio

link will be timeout before the handover starts, thus resulting in call drops. By optimizing the RLT value, call continuity is ensured from point P to point Q without inconvenience to the customer.

Considering all above dynamics involved in radio environment including clutter variations, Inter-site distance variations, it is essential that setting of RLT parameter value be left to the Operator to decide. Every Operator is required to set RLT values differently in different geographies based on its prevalent network situation (spread / site density, etc.). For example an Operator having less sites in a geography (possibly because of lesser traffic demand) may need to set RLT parameter differently than another operator having 30 to 40% more sites (because of traffic demand) in the same geography.

**Hence we recommend that RLT setting should be left to individual operators and there is no need for TRAI to mandate the setting values.**

**Q6: 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**

**Idea Response:**

At the outset, it is submitted that the MSC CDR Data is used universally for billing purpose only.

Call Data Records (CDRs) is generated by MSC while Call drop data is generated by BSC and fed to OSS for generating reports. CDR data cannot provide information on call drop conclusively since call drop event is only captured in radio network. Further, **there are no technical standards from OEMs to capture call drop using CDR meta data. Globally drop call data is derived from Radio network only. All traditional & advanced optimization tools use input from Radio network counters & measurements, not from CDRs.**

In the consultation paper, TRAI mentions that in sample analysis it was observed that more than 30% of calls were of less than 30 seconds duration. This data point itself emphasizes that there is huge tendency among mobile subscribers to make voice calls of small duration (less than 30 sec). Hence relating 30 seconds call duration to possible drop call would be a very vague logic and should not be used.

In real life there are many scenarios which result in intentionally terminated calls of duration less than 30 sec such as calling a cab / taxi / driver, revert to the caller with a short sentence like “ I am busy / call me later / cannot talk now” etc.. Redialing for a short duration call after a short / long call termination also is possible in case user wants to reinitiate discussion for a point missed in the last conversation.

Hence, the TRAI’s assumption that redialing to the same number within 30 seconds of previous call termination can be attributed to a dropped call is erroneous. Also it is mentioned in the consultation paper that parameters like Signal level & voice quality are captured in MSC CDRs. We would like to stress upon the fact that such details are not available in MSC CDRs nor any such standards exist.

**Thus call drop cannot be calculated from CDR meta-data as the same is not designed for that purpose.**

**Q7: 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**

**Idea Response:**

It is submitted that customer satisfaction index will be a very subjective parameter to use and is likely to vary among customers with different usage profiles. It is pertinent to mention here that customer expectations vary from one geography to another and also from time to time, depending on various factors like maturity of the subscriber in the network, age group, usage pattern, awareness levels, literacy levels, tariff plans etc.

Customer satisfaction index conceptually is very dynamic and non-standard when compared with a standard measurement QoS parameters. Combining objective parameters of Network QoS derived from system statistics & subjective parameters like customer survey inputs is not likely to yield any concrete usable Index.

**Thus monitoring QoS from radio network KPIs like accessibility, retainability, integrity, etc. is the best available objective way and should be continued.**

**Q8: 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**

**Idea Response:**

It is submitted that the prevailing financial disincentive structure is already very recent, having been notified in 2015. Further, offering of poor QoS by any TSP in any case leads to business loss by virtue of its losing subscribers to competition through Mobile number Portability. Hence, the penalty for offering inferior network QoS already exists in the form of market dynamics leading to customer port-out.

Further, we feel that changing of Regulations should not be a frequent phenomenon and there should be stability and predictability in the regulatory regime.

We would like to suggest that there should be no financial disincentive on marginal violations of KPIs (say less than 10 to 15%). The financial disincentive for violation above marginal value can have a graded structure. However the maximum cap of the financial disincentive shall be limited to the present value of Rs two lakhs.

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**Annexure B**

Mobile Telephony QoS Indicators					
Sr No	Country	Country Code	Voice Quality	Dropped Calls	Unconnected calls
1	Argentina	AR	Yes	Max 3%	Min 95%
2	Brazil	BR	No	Below 2% per month per service area	Successful call completion for originated calls: at least 67% of attempts per service area in the month
3	Chile	CL	No	Max. 3% for urban base stations and 10% for "rural base stations".	Max. 3% for urban base stations and 10% for "rural base stations".
4	Ecuador	EC	Yes MOS (conversaton quality) >3.3	Max 2% (2G and 3G network measured in peak hour)	Similar indicator used: Completed calls. Max 4% (2G and 3G network)
5	Mexico	MX	No	Dropped calls below 3%	Unsuccessful call completion: below 3%
6	Paraguay	PY	No	98% completed calls (meaning 2% of dropped calls)	2% unconnected calls over all call attempts
7	Peru	PE	The parameter used is MOS ('mean opinion score'). It is measured with values from 1 to 5 (target 2.80 or above depending on semester)	Dropped calls not above 2%	Unconnected calls not above 3%