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

Preamble

We thank the Authority for giving us the opportunity to respond to the Consultation Paper. The Consultation Paper discusses various 'technical outcome' parameters in detail and the consumer perception or experience while, using the telephony services. However, this Consultation Paper misses on the building blocks of wireless technology, related dynamic conditions it works, complexity of design, challenges in deploying and maintaining a wireless network as also various policy related issues which need to be resolved in India so that the best of network quality can be delivered to consumers.

The objective of the Consultation, as apparent, is to review the QoS Standards for the telecom services. Also, it appears that TRAI is considerably to monitor some of micro level planning and operational KPIs. The micro management of the same should be left to TSPs internally. TRAI may kindly like to focus on broader KPIs only

Wireless Networks

Such networks and the wave propagation are greatly impacted by the presence of various objects near us like natural objects like water bodies, mountains etc, or the man -made objects like tunnels, buildings or even the vehicles etc. In the presence of these static as well as dynamic factors, it is in fact impractical to consider that two calls made between the two users at the same place at different times to encounter exactly the same conditions, not to speak about the calls between different set of mobile users.

Further, the density of mobile users is not uniform across the various places and there can be a sudden movement of users from one place to another within the LSA. Therefore, the mobile wireless communication technology has been designed in such a way so as to counter various dynamic conditions to the extent possible. But even after countering these dynamic factors it is not fully possible to compensate for various dynamic factors.

To conclude, we would like to submit that the Wireless Networks work under challenging external conditions which are not uniform in time and place and are beyond control of mobile operators.

Important factors and Challenges that impact the Indian Telecom Sector

Any cellular technology, however advanced it may be, depends on underlying infrastructure like Mobile Towers, fiber optic cables or microwave links to connect the mobile towers to the core network.
The installation and maintenance of the underlying infrastructure depends on various policies like permission to install the towers, Right of way to lay fiber cables etc. Indian operators have time and again been voicing their concerns for the lack of enabling policies that are yet to be enacted in India to realize the full potential of the sector.

- Uniform policy around mobile towers
- Right of way
- Spectrum availability and Pricing for licensed operators
- Address misplaced concern of the public in respect of EMF radiation
- Challenges pertaining to maintenance of Telecom Infrastructure
- Power Supply
- Unplanned maintenance work by civic bodies
- Sealing of sites by civic bodies

Therefore, it is imperative that these impediments are resolved at a priority to improve the QoS of mobile telephone services in the country through enabling policies.

Technological Perspective: Wireless technology unlike Wireline technology functions under a challenging external environment like natural, man-made barriers, Interference from various objects etc due to the wave propagation 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 etc. is not uniform across a city, district or even a LSA. Due to the inherit challenges in the wireless technology itself, the level of challenges for maintaining QoS at different areas with different characteristics as mentioned are different. Therefore, 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 level or a 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 judgment about the network's performance.

Therefore, it would be arbitrary to make the QoS compliance at a level granular than a Network Level or the LSA Level.

QoS maintenance – Market and Consumer Empowerment perspective

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

- Hyper-Competitive market
- Mobile Number Portability

Therefore, the case for defining stringent QoS norms is not desirable 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.

Having made the above submissions, we also believe that the Regulated model for QoS does not necessarily bring out the best from the sector.

Steps being taken by Indian Operators

Various steps being taken by operators to improve QoS in the country. Some of the steps being taken by the operators are:

a. Deployment of additional BTSs
b. Optimization Efforts
c. Upgradation of existing sites and network elements

TTL Response on the Consultation Questionnaire

Our response to the questions given for consultation is as given below:

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.

TTL Response

TTL is committed to ensure the compliance and we always focus on providing good quality of service to the customers and strive for improvement of the QoS parameters as specified in Regulations.

TTL believes that the measurement of QoS **must be** applicable at overall Network/LSA level as specified in the current license and **it is not** desirable to measure at LDCA-wise or DHQ/ city/ town-wise or BTS-wise.

Reasons are as given below:

a. As CMTS License is at a Network/Circle level, the entire planning for monitoring and reporting is being done accordingly and workflows are aligned for the same at a considerable cost. It is accordingly apt and appropriate that QoS be measured at a Network/LSA level which fairly indicates the overall performance of the LSA.

b. The topography, population density, call volumes per site vary much from district to district across any LSA. Based on different population density & topography, different benchmarks would be required and one single benchmark cannot be possible to implement and achieve.

    To have such type of techno-commercial feasibility is not realistic.

c. Lack of availability of Digital maps with clearly defined towns / DHQ's boundaries lead to different and perceptual interpretation of the boundaries by the operators and the regulator's representatives / Auditors leading to un-necessary mutual rounds of clarifications / re-clarifications and at times without any conclusion.

d. The quantum of effort to generate and publish voluminous data and reports in about 640 districts across the country for audits, would get significantly increased which rather would be non-gainful deployment of resources without serving much purpose.

e. The Authority is already monitoring the QoS of Towns/LDCAs/SSA towns periodically through IDT/Operator Assisted Drive tests as practiced regularly and in this process, QoS of DHQs/towns are already published in media & TRAI website for customer awareness

f. The current and already existing mechanism of reporting for the entire circle takes into consideration the performance of not only the top towns but also the smaller villages, highways, railway routes etc.

g. In any case, the consumers have choice to change network under MNP not only within the circle but also across country in case not satisfied with the QoS offered by their service provider. In such a fierce competition the TSPs themselves are conscious of the QoS and QoE parameters. Customer, as a king should be allowed

to have its own experience on normal parameters. Customer, has not only choice the migrating but also of reporting its experience, dis-satisfaction etc. to the regulator.

h. The current mechanism of measuring the performance captures every call that is originated in the network and is good indicator for the performance of the network.

Hence, current Assessment of QoS at LSA level should only continue.

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.

TTL Response

Dropped Call Rate (DCR) should be calculated at the Licensed Service Area Level during Time Consistent Busy Hour (TCBH) and not at BTS Level during the Cell Bouncing Busy Hour (CBBH).

Reasons are as given below:

a. It is already suggested in our response to Q1 that CMTS License is at a Network/LSA level and it is appropriate that QoS also be measured at a Network/LSA level during TCBH which fairly indicates the overall performance of the LSA.

b. The current Networks (LSA) are built in such way that the overall dimensioning of the Network, based on GOS-2% (as per the license condition) is done at Network Busy hour and not at individual BTS/Cell traffic load. The overall DCR at LSA level during TCBH gives a holistic view of the Network from maximum traffic standpoint.

c. Usually in a network KPIs there is an overall percentage of call drops is monitored. The current mechanism of reporting the call drop for the entire circle during TCBH takes into consideration the call drops against the total call volume generated in the network. In case the failure rate is 1%-2%, then usually the worst performing elements are monitored i.e. catching by the tail and the same is already done by monitoring -% worst effected cells in the network with DCR > 3 % and is adequate and challenging enough to monitor performance at Cell/BTS level with exclusive of low call volume, Highways, Railway and Fringe cells/BTSs.

d. The CBBH measurement is done on the basis call drops in individual BTS which varies based on the traffic and customer mobility of the cell. The BBH measurement of DCR does not take into consideration the volume of the calls generated in the cell / site which is inconsistent based on customer behavior during a specific time of day.

e. In case it is measured at the Cell/BTS level during BBH, it would require a lot of changes in design of the Network (Performance Monitoring) which is highly complex and quite non-feasible to be actually implemented by operators. This is over and above the inconsistencies in traffic and volume of calls as BBH of cell and BTS keep changing everyday due to customer behavior – quite unpredictable at times. Even to extract such information for external reporting using normal tools would add to techno-commercial non-feasible system.

f. Measuring at Cell/BTS level during BBH is highly inconsistent as a false positive call drop number cell may get reported in BBH calculation, as a result even low call drop cell is may report for non-compliance due to its call low call volume with only just a few call and well limited drops.

g. Globally in no other country is reporting the KPI at BTS level as it is a waste of resources if applied to all BTSs. TRAI may rather focus on Network level KPI as TSPs are already going into granularity of cell levels to address call drops and are continuously working to improve the overall quality of the network and service experience for its customers.

Hence the current calculation of Call Drop Rate at LSA level during TCBH should only continue with exclusive of low call volume, Highways, Railway and Fringe cells/BTSs.

Q3. 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.

TTL Response

The measurement of QoS and benchmarking must be done at overall Network/LSA level as specified in the current regulation and should not be measured at district-wise or BTS-wise.

Reasons are as mentioned below:

a. Already reasonable efforts are being done by operators to improve the QoS across geography which is currently measured at a Licensed Service area level. The mandated QoS benchmarks are achieved despite challenges in the field in terms of spectrum scarcity, sites not acquired, EMF fears and increased Infra issues.

b. The Authority in light of some ground realities beyond the control of TSPs should not expect the same levels of Quality district wise or BTS wise as the topography, population density , call volumes per site vary from district to district across any LSA. Based on different population density & topography, different benchmarks would be required and one single benchmark cannot be possible.

c. The granularity of network planning, operations and micro-management is the role and responsibility of the operators rather than of the monitoring agency. The operators are very aggressively performing such actions within their own means in the interest of their business in such a fierce competition to stratify their customers and offer them quality services.

d. The Authority is already benchmarking the QoS of Towns/LDCAs/SSA towns periodically through IDT/Operator Assisted Drive tests as practiced regularly and in this process QoS of DHQs/towns are already published in media for customer awareness.

e. The current benchmarks in themselves are already stringent considering the fact that several stakeholders are involved in the supply chain and the end to end eco-system full of uncontrollable operational challenges for an operator as given below, which cause an hindrance in looking at BTS wise/ city wise KPIs/ SLAs –

   - Un-authorized Repeaters being sold and used by public at large(flouting the country's regulation)
   - Jammers being used by Jail authorities, extending beyond the jail premises
   - Signal pollution from across the borders
   - Non-acquirable sites due to landlord challenges/ EMF challenges/ un-availability of authorized land, etc
   - Deep indoor problems due to architecture issues – e.g. Walled city e.g. Chandani Chowk, etc
   - Site sealing by District Administration/Municipal Bodies
   - Fiber cuts due to civil works/ road expansions – impacting into outages
   - Electricity availability coupled with Lawlessness.
   - Restrictions on time of Access to BTS by site owners

- Permissions not granted by civic authorities for work like road cutting for cable repair work
- Transportation delay in restoration at rural areas etc

f. In addition to the above there are other factors which are not under control of service providers which impact the QoS parameters as given below:

- type of service being accessed-Voice or Data-which is again spectrum limited
- consumer/user behavior such as number of subscribers using the services in the area,
- kind of device(sensitivity of device) being used with lots of low key profile handsets available in India markets
- Laws of physics as applicable to Mobile/Radio Electro Magnetic Wave Propagation, therefore current Benchmark is adequate enough to maintain the services.

g. TCH / BCCH frequency planning with limited no of frequencies available within the starting 4.4 MHz allocated spectrum makes it challenging to maintain the given QoS with large numbers of users continuously loading the network. The same spectrum is shared for Voice as well as Data, which has recorded tremendous growth.

h. Globally there are enough spectrum resources e.g. In China, it is only the cost of Equipment and Minimum Roll-out obligation and SPECTRUM is provided by the Govt free of cost. In India the operators have to provide for Spectrum Cost, Equipment Cost and Minimum roll-out obligation also.

Above three costs determine the extent and the time to roll-out based on Customer Segmentation being serviced. The segment being serviced may also differ from operator to operator and thus the Coverage Levels in different areas. (In case we could have KPIs for the areas where we have MRO and signal strength better than - 85 Dbm).

Thus, keeping these factors in mind, there should not be any change in the benchmarks and the current regulation at overall Network/LSA level should continue if, not further relaxed (given this period of extreme and multiple challenges)

Q4. 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.

TTL Response

The current QoS parameters like Network Availability, Blocking, Call drop parameters are technology agnostic and all these parameters can be measured and reported irrespective of GSM/CDMA/3G technology deployed. However, the benchmarks are not technology agnostic as these are design/technology / standards / Best practices / feasibility driven.

For example – A throughput parameter name can be a technology agnostic but benchmark related to throughput cannot be fixed as this is technology dependant on the basis of its design specification. Data speeds are technology dependant and hence benchmark cannot be technology agnostic.

Q6.   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.

TTL Response

RLT is a continually configurable parameter and is a part of the GSM Standards based on 3GPP /ETSI Recommendations which is used globally by all operators to ensure optimal customer experience.

RLT parameter should not be set as a fixed value and this should remain as a tunable parameter depending on the radio conditions. Reason why RLT is configured/fine tuned based on the requirement for optimization of Radio propagation conditions and criteria are given below:

- Variance in RF propagation due to terrain (i.e. hilly, costal, congested area, cell edges etc.)
- Highway sites handover optimization
- Railways sites handover optimization
- Shadow zone optimization in Urban areas
- Optimization need due power cuts, fiber cuts due to infrastructure development, Grid power failures
- Optimization need due to Interference generated by to illegal repeaters or Military/Army Radio equipments
- To improve customer experience / complaints

For example, a customer is travelling on a highway or in the city and in such a situation the signal quality might get impacted due to varying radio signal strength.

If the value of this RLT parameter is kept low, in such cases then the call would get disconnected frequently even though there may be only a momentary loss of voice quality, leaving the subscriber with no option other than to frequently redial the number to initiate a new call.

Keeping the parameter high will lead to utilization of radio resources for longer duration which is again not desirable by the operators. It is hence recommended to have this as parameter to tuned at the discretion of the operators.

Hence, RLT parameter should not be fixed and must remain as a tunable parameter.

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.

TTL Response

Call Drop Rate should not be measured / computed from the CDR Meta Data.

Reasons are as given below:

a. We are already monitoring the network ideally through different OSS tools, as a global practice. We ourselves are more concerned about our customer experiencing call drops and working on continuous improvement in order to maintain/hold the customer & business in the current competitive environment.

b. CDRs are rather captured for calls which are answered by the B-party and not for Calls which are established as required in the regulation.

c. Identification of the Cause codes which leads to an Abnormal Release and tagging it as a call drop is a challenge across all OEMs. Currently, there is no conclusions on uniform approach arrived on the cause codes to be considered for call drops.

d. Identification or segregation of the Cause Codes whether they are due to Network behaviour or Consumer behaviour or device behaviour is not possible with present information in the CDR.

e. Analytics of voluminous CDR data requires a sizeable, wastage of IT resources and man hours which doesn't benefit the operator or the Authority to conclude on the exact cause of the drops and implement actions for improvement.

Hence, it is not right to calculate the Call drop rate and analyze the reason for call drops from CDRs since the actual reasons for call drops are multiple – network failures, customer handset compatibility issues, handover issues, credit limit, outstanding balance, etc.

The current measurement of QoS from the OSS tools is a good enough indicator as practiced globally.

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**.

TTL Response

QoE of the consumer cannot be quantitatively measured by estimating the Customer Satisfaction Index and may not be helpful because of the below reasons:

a. QoE is affected by technical and non technical aspect of service; it is a very **subjective** term where overall acceptability may be influenced by **user structured and unstructured expectations and context**.

b. The CSAT data cannot be usually quantified as it is only the views, perception, and opinion of the consumer. Customer satisfaction surveys through third party agencies are already conducted by Authority on regular basis and already published in media & TRAI website for customer awareness.

c. QoS provided by Network, which is measured objectively must be monitored by TRAI rather than voice of the customer as the conclusions based on subjective information are usually unreliable.

d. We ourselves are more concerned about our customer experiencing and working on continuous improvement in order to maintain/hold the customer & business in the current competitive environment.

   Hence CSAT index will not help in estimating the QoE of the consumer.

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.

TTL Response

Graded Financial Disincentives based on the performance and quantum of non compliance of benchmark **should not be** done by TRAI for the reasons as mentioned below

a. Already reasonable efforts are done by operators to improve the QoS and benchmarks are achieved despite challenges in the field in terms of spectrum scarcity, sites not acquired, EMF fears and increased Infra issues.

b. The current disincentive mechanism of TRAI already imposes a penalty of Rs. 100,000/- for first default and up to Rs. 200,000/- for subsequent default for Non compliance to QoS benchmark. This existing penalty itself is an indicator that the parameters are not complied and needs improvement which itself is a driving factor for the improvement of the KPI values.

c. The Show cause notices and Pay orders should be a symbolic representation and trigger operator to improve the QOS. The Authority is already monitoring the QoS of Towns/LDCAs/SSA towns periodically through Monthly QOS reports, IDT/Operator Assisted Drive tests as practiced regularly and results are already published in media & TRAI website for customer awareness. Loss of customer/revenue due to poor services itself a bigger loss compare to the penalty imposed to operators hence TSPs themselves are conscious of the QoS and losing business opportunity as Customer is well aware of QoS and has choice of migrating to other networks.

d. Apart from the License Rollout Obligations, Operators have rolled out Network in smaller villages, highways, railway routes etc in order to facilitate contiguous coverage to the customers. Monitoring and further applying graded is incorrect and will force the operators to shut down the BTSs whose QoS is affected due to mobility of customers which could otherwise provide at least coverage to the customers.

e. The other location are as below:

S. No	Type of Cause	Details
1	New Site Restrictions	Non Feasibility of deployment of new sites in some specific areas like Cantonment, Hospitals, Schools etc. These coverage gaps/weak coverage areas impacts the KPIs
2	EMF Issues	Fear of Mobile radiation resulting in owner issues and sites are being removed causing coverage gaps.

3	Fiber Cut	Outages due to fiber cut because of Road Construction/Widening Activity and other Municipal Maintenance work. No electricity supply in most of the Rural towns for 2-18 hrs in most circles due to poor infrastructure. This has an adverse effect on the quality of the network & degrades the QoS.
4	Theft Cases	Outages on account of theft from sites.
5	Power Grid failures	Outages due to long power grid failures.
6	Boundary and Fringe Cells	Inter-site distance for Single site town is more in rural areas, resulting in high TA (Timing Advances) which results in call drops.
7	Low Call Volume Cells	Low Call Volume Cells with <100 calls in BBH to be excluded for Cell level calculations, as a single instance of degradation contributes or magnifies to a high %age of KPI value. e.g TCH Drop Call Rate, even a single call drop contributes to a high DCR because of overall low number of calls at the site.
8	GSM Spectrum non-availability	Due to spectrum limitations, KPI is affected for sites with high utilization.
9	Force Majeure Cases	Outages on account of natural calamity, terrorists attack/bomb blasts or any other force majeure.
10	Political Unrest	Outages due to political restrictions, Mob vandalism, Worker/Security Union issues, law and order problems preventing access to sites in any area.
11	External interference	Sites where KPI degradation caused due to cases of external interference due to other cellular operators, neighbour country operators, cable TV operators etc.