



## Vodafone's Response to TRAI Consultation Paper dated February 26, 2018 on 'Voice Services to LTE users (including VoLTE and CS Fallback)'

### PRELIMINARY SUBMISSIONS:

1. Given the intense competitive nature of the Indian mobile services market, mobile operators are under severe competitive pressure to maintain the QoS not only to retain the existing subscribers, but also to attract new subscribers. **We therefore believe that QoS ought to continue to be driven by market forces rather than by regulatory intervention.**
2. With respect to voice services to LTE users, many mobile operators are in the process of launching these services very recently and these are at a nascent stage in terms of penetration and traffic. We believe that the **Authority should adopt a light touch approach to QoS regulation** w.r.t these services for the near future and let the same be driven by market and consumer choice, which are the most powerful drivers of QoS. **As mobile operators are increasingly in the process of deploying VoLTE, there is undoubtedly a transition period for consumer adoption and for the technology to proliferate and function optimally**, which needs to be allowed/factored in the regulatory framework.
3. **Current QoS regulations** prescribed by the Authority are **devised on the principle of technology agnosticism** w.r.t the benchmarks, which are helpful for consumers as these are understandable to them. We believe that any QoS regulation **should continue to be devised on this principle at all times**. The underlying formulae and calculation methodology can be different, but the benchmarks should be the same. Further, we believe that the Authority should focus on simplifying the framework and identifying those QoS benchmarks/KPIs that are truly relevant and understandable from an end-user perspective for various aspects of the service.
4. Further, any review of the existing **QoS parameters/benchmarks should be undertaken from an end user perspective**, focusing on various aspects of service usage (such as network availability, accessibility and retainability) and no granular/detailed network QoS parameters/benchmarks should be set as long as the overall compliance to respective aspects of service usage is being met. This approach is consistent with ITU definition of QoS (as laid down in ITU recommendation ITU-T E.800), international practices and will ensure that the QoS framework offers the best results for consumers.
5. From an end-user perspective, VoLTE is essentially providing voice call service, thus same QoS benchmarks/KPIs apply when depicting VoLTE Availability, Accessibility and Retainability. Therefore, current QoS regulations (capturing enode B downtime, call setup success rate, dropped calls) are sufficient to monitor these parameters for VoLTE/CSFB



calls in the near term. For operators who are having multi-technology networks, voice is being carried across all radio access technology types in order to give a seamless and optimal experience to end users.

6. It is thus reiterated that **in the short term/near future, the Authority should adopt a light touch approach** to QoS regulation w.r.t these services. **In the medium term, the Authority may initiate a consultation to arrive at the mean opinion score (MoS) based measurements** (based on drive tests) for monitoring QoS of VoLTE calls. **Globally, MoS as a parameter is measured to assess the voice call quality in an IP network.**

### **Issue-wise Response:**

**Q1. Whether prescribed QoS parameters, as per existing QoS Regulations, are sufficient to effectively monitor QoS of VoLTE/CSFB calls? Please provide suggestions with justifications.**

A1. We believe that the prevailing QoS regulations are sufficient to monitor network availability, accessibility and retainability for VoLTE/CSFB calls, which are the key network service quality parameters from an end-user perspective. It is also important to note that majority of mobile operators in India are in the process of launching VoLTE services recently with a limited set of mobile devices configured with mobile operators' VoLTE networks and there is limited VoLTE penetration and traffic. Therefore, it may be desirable to provide some time for the technology to proliferate and function optimally before prescribing any additional/new QoS parameters. In the medium term, the Authority may initiate a consultation to arrive at the mean opinion score (MoS) based measurements (based on drive tests) for monitoring QoS of VoLTE calls. It is reiterated that globally, MoS as a parameter is measured to assess the voice call quality in an IP network.

The device performance has a large bearing on the VoLTE performance as well. Currently there is no regulatory mandated device certification programme in India. It is recommended that the Authority/Licensor may set up a regulatory mandated device certification process so that all devices are certified and meet minimum quality criteria to ensure that end-users do not face any device related issues on VoLTE.

**Q2. If existing QoS parameters are not sufficient to monitor QoS of VoLTE/CSFB calls, then what new parameters can be introduced? Please provide details with justifications.**

A2. As mentioned in our response to Q1 above, existing QoS parameters are sufficient as of now, given the nascent status of VoLTE deployments/ deployment plans by the majority of mobile operators in the country. However, in the medium term (say 6 to 9 months from now), VoLTE MoS (from drive test) can be included as a voice quality parameter to capture Voice Quality and Mute call issues. For defining the VoLTE MoS values and the drive test methodology, it is requested that



the Authority may kindly consult with all mobile operators so that all relevant aspects across mobile operators' networks can be factored into, prior to issuance of any QoS parameters on the same. The VoLTE MoS drive tests can be performed on quarterly basis as part of the existing drive tests being carried out by the agencies appointed by the Authority for conducting IDT (independent drive tests) to assess the network quality provided by mobile operators.

The main benefit of drive testing is that it measures the actual network performance that a user on the actual drive route would experience. Also, the MoS measurements through drive tests under specified framework/conditions can help exclude any bias of device/end users as much as possible while allowing for objective measuring and accurate definition of analyzed geographic areas. It also allows services to be analyzed independently of the operation of mobile networks themselves. We believe this would be the best method to conduct operator performance benchmarking, as it guarantees that tests are made under equal and simultaneous conditions for all.

**Q3. How to define instance of silence/voice mute? How many such instances may be accepted during voice call? Whether existing parameters like packet loss, jitter, latency, end-to-end delay are sufficient to identify or measure silence/voice mute or some other parameters are also need to be factored to measure it? Please provide details with justifications.**

A3. In the medium term, voice call sustainability derived from MoS measurements can be considered as a measure to capture silence/mute calls. Consecutive MoS measurements (based on drive tests) less than a certain value can be a clear indicator of silence/voice mute issues which the mobile operators can address as part of QoS voice quality performance. The definition of such consecutive MoS measurements for the purpose of categorizing silent/mute call instances can be undertaken basis a consultation with all mobile operators. Packet loss, jitter, latency, end-to-end delay are all co-related parameters which ultimately will affect the voice quality and hence, MoS. Thus, MoS is a subscriber view of voice performance.

**Q4. How to measure, report and evaluate network or service from perspective of silence/voice mute problem? Which ITU measurement tools can be used to prepare framework for measurement of silence/ voice mute problem? Please provide details with justifications.**

A4. As mentioned in our responses to Q2 and Q3 above, voice call sustainability derived from MoS measurements through drive test can be considered as a measure to capture silence/mute calls for evaluation of network or service. The measurement approach can be arrived basis a consultation with all mobile operators. There are several standards used within an MOS framework to assess quality (PESQ/POLQA, P.563, E-Model, and P.564). While each method has its own strengths and weaknesses, PESQ/POLQA provide the most accurate testing result and can be used for MoS measurement.



**Q5. Whether certain range of timers and constants are required to be prescribed which may affect VoLTE call quality assessment? If yes, which may be those timers and constants and what may be the suggested ranges of timers and constants? Please provide details with justifications.**

A5. No. The prescribed QoS parameters and MoS measurement (that we believe would be defined in the medium term) will be sufficient to take care of such constants/timers. While the ranges of timers/constants are as per the 3GPP standards, the actual values set are dependent on vendor implementations which may be different across all mobile operators (depending on which operator has deployed which vendor's equipments in its network). Further, the range of timers and constants, apart from being vendor specific, is also vendor recommended and cannot be tweaked for achieving a simplistic uniformity across all vendor equipment types.

**Q6. What parameters like Post Dialing Delay (PDD) may be introduced to measure performance of users being served voice via CSFB? What may be the threshold? How to measure report and evaluate? Please provide details with justifications.**

A6. It may please be noted that call set up time (or service access delay or post dialing delay) as a parameter was dropped after due consultation by the Authority while framing the 2009 QoS Regulation (which is still in existence). Hence, we believe that there is no need to re-introduce this parameter and that too specifically only for CSFB on LTE since CSFB is applicable for devices which are not VoLTE capable. CSFB call is same as 2G/3G call only hence all parameters are already captured and no separate KPIs for CSFB is needed.

**Q7. Any other issue which is relevant to this subject?**

A7. N.A.

New Delhi  
28 March 2018