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Subject: COAI Response to TRAI Consultation Paper on Review of Quality-of-Service Standards for Access Services (Wireless and Wireline) and Broadband (Wireless and Wireline) Services.

Dear Sir,

This is with reference to the TRAI's CP on "Review of Quality-of-Service Standards for Access Services (Wireless and Wireline) and Broadband (Wireless and Wireline) Services" issued on 18th August 2023.

In this regard, please find enclosed COAI's response to the Consultation Paper attached as follows:

1. Preamble and Response to the Questions in the TRAI Consultation Paper.
2. Chapter 3 Section I & II: Annexure – 1.
3. Chapter 3 Section III: Annexure – 2.
4. Chapter 3 Section IV & VII: Annexure – 3.
5. A table on international practices on QoS: Annexure – 4.

We trust our above request would merit your kind consideration and look forward to your valued support on the same.

With Regards,

Digitally signed
by Lt. Gen Dr. SP
Kochhar
Date: 2023.12.14
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Lt. Gen. Dr. SP Kochhar
Director General

Copy to:

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Response to TRAI Consultation Paper on “Review of Quality-of-Service Standards for Access Services (Wireless and Wireline) and Broadband Services (Wireless and Wireline).”

A. Introduction

- i. We thank the Authority for giving us the opportunity to respond to the consultation paper. At the outset, we submit that Indian customers are being provided best in class Quality of Service (QoS) and Quality of Experience (QoE) and there is a need to further simplify the existing QoS benchmarks to reflect the market realities.
- ii. Further, there are a multitude of policy, regulatory, legal, and other issues that require urgent attention from the Government and TRAI before any new thinking on making the QoS benchmarks more stringent is considered. These considerations are crucial to ensure the delivery of the best possible network quality to consumers, to the extent practically achievable.
- iii. There are several factors which influence QoS standards for telecom services such as telecom Infrastructure concerns and policies and various external and internal factors that impact telecom QoS. These have been highlighted in our response below and may kindly be taken into consideration by the Authority.
- iv. We humbly request TRAI to thoroughly assess the current state of networks, including their constraints, both within and beyond operators' control, before establishing any parameters or benchmarks. It is imperative to identify and address these obstacles proactively.
- v. TRAI should initiate recommendations and measures to removal of these impediments before establishing/ finalising new parameters or benchmarks for the industry. Ground realities must be taken into account, and any such decisions should be guided and supported by well-founded principles of Regulatory Impact Analysis(RIA) aligned with the inherent nature of the telecommunications landscape.

B. Moving towards deregulation cum light-touch regulatory approach for QoS

- i. The Telecom Regulatory Authority of India (TRAI) works with the primary objective of establishing a transparent policy framework that fosters both fair competition and a level playing field within the telecommunications industry. To achieve this objective, TRAI has consistently issued a multitude of regulations, orders, and directives spanning across various issues which include tariff, interconnection, and quality of service (QoS).
- ii. TRAI has demonstrated a correct understanding of market dynamics by rightfully adopting a forbearance approach for tariffs acknowledging the effective functioning and maturity of the telecom industry in India. This regulatory forbearance approach aligns with international best practices, reflecting a market-driven approach. However, in the case of QoS, the authority continues to move towards a harsher regulatory stance. Over the period of time, instead of deregulating QoS norms gradually, TRAI has been further tightening the QoS regulations. This contrasts with the trajectory observed in tariff regulations, where a move towards forbearance signified maturity of



the market. **Given the sector's maturity and the evolving dynamics, it becomes pertinent for TRAI to consider a similar approach for Quality-of-Service regulations.**

- iii. While TRAI's focus on ensuring high-quality service for consumers is commendable, there is an opportunity to re-evaluate the regulatory approach for QoS parameters. **There is a need to strike a balance between the industry and consumer protection for which a phased transition or a glide path towards deregulation of QoS should be considered.**
- iv. We strongly believe that deregulating quality of service parameters could empower market forces to drive efficiency, innovation, investment, and improved service standards. This shift aligns with the sector's evolution, emphasizing a balanced regulatory framework that fosters competition while ensuring customer satisfaction. Therefore, we submit that:
 - In the short term, the **Authority may consider moving towards a light touch regulatory framework for QoS** i.e., only limited parameters should be measured and reported on a quarterly basis.
 - **In the long-term, the Authority should deregulate the QoS parameters while maintaining the oversight** through drive tests and/or (a mix of) drive tests and 3rd party surveys.

C. TRAI Proposals on QoS lead to Significant increase in reporting requirements.

- i. The changes proposed by TRAI in this Consultation Paper on QoS entail a shift from quarterly reporting to monthly reporting thereby significantly increasing the reporting requirements.
- ii. For example - presently, there are approximately 880 compliance instances for reporting under current regulations for Network parameters in Wireless Services. However, the proposed regulations are expected to significantly increase this number to around 10,440, representing an increase of over 11 times the current requirement. The effectiveness of simply increasing reporting frequency and introducing additional benchmarks in enhancing the Quality of Service (QoS) and positively impacting customers' lives remains uncertain, as it does not directly address the challenges faced by the telecom industry.
- iii. This shift raises concerns about its alignment with the principles of Ease of Doing Business (EODB), a focal point of the Government. The substantial surge in compliance instances appears incongruent with the government's emphasis on streamlining processes and reducing bureaucratic hurdles.
- iv. It is also pertinent to note that, especially in the case of the Indian telecom industry, relying on monthly averages does not portray the accurate picture. Opting for quarterly averaging provides a more comprehensive overview, effectively mitigating the impact of fluctuations over a shorter time span thereby presenting a clearer picture.
- v. The table given below as an example furnishes the details and illustrates the magnitude of increase in compliance requirements of the newly proposed regulations.

Parameter Name	Present Regulation					Proposed Regulation				
	No of LSA	State + UT	Compliance Instances	Quarterly / Monthly	Annual Compliance Instances	No of LSA	No. of State / UT	Compliance Instances	Quarterly / Monthly	Annual Compliance Instances
(a) % of commissioned cells for which geospatial service coverage map is available on service provider's website - 100%	0	0	0	0	0	22	36	58	Monthly	696
(b) Accumulated down-time (Cells not available for service)	22	0	22	Quarterly	88	22	36	58	Monthly	696
(c)Worst affected cells due to down-time (cells not available for service for more than cumulative 24 hrs in a month)	22	0	22	Quarterly	88	22	36	58	Monthly	696
(d) Reporting of significant network outage to the Authority within 24 hrs of start of outage (services not available in a district or state for more than 4 hrs)	0	0	0	0	0	22	36	58	Monthly	696
(a) Call Set-up Success Rate for circuit switched voice or session Establishment Success Rate for VoLTE or DRB accessibility success rate for VoNR, as applicable(within licensee's own network)	22	0	22	Quarterly	88	22	36	58	Monthly	696
(b) SDCCH/Congestion/Paging channel congestion/RRC congestion.	22	0	22	Quarterly	88	22	36	58	Monthly	696
(C) Traffic Channel Congestion i.e.TCH, RAB,E-RAB, EN-DC (E-UTRAN New Radio dual connectivity for NSA to access 4G and 5G both networks at same time) or DRB (Data Radio Bearer for SA) Congestion.	22	0	22	Quarterly	88	22	36	58	Monthly	696
(a) Network QoS DCR Spatial Distribution Measure for (I) Circuit switched (2G/3G) network [CS_QSD (92,92)]	22	0	22	Quarterly	88	22	36	58	Monthly	696
(II) Packet switched (4G/5G and beyond) network [(PS_QSD(96,96)]	22	0	22	Quarterly	88	22	36	58	Monthly	696
(b) Network QoS DCR Temporal distribution measure for (I) Circuit switched (2G/3G) network [CS_QTD (97,90)]	0	0	0	0	0	22	36	58	Monthly	696
(II) Packet switched (4G/5G and beyond) network [(PS_QTD(97,96)]	0	0	0	0	0	22	36	58	Monthly	696
(c) Connections with good voice quality, Circuit Switched or Voice Quality and LTE (VoLTE) or VoNR as applicable.	22	0	22	Quarterly	88	22	36	58	Monthly	696
(d) DL Packet Drop Rate for packet switched network (4G/5G) and beyond) [DLPDR_QSD (96,96)]	22	0	22	Quarterly	88	22	36	58	Monthly	696
(e) UL Packet Drop Rate for packet switched network (4G/5G) and beyond) [ULPDR_QSD (96,96)]	22	0	22	Quarterly	88	22	36	58	Monthly	696
Successful SMS delivery within service provider's network in less than 20 seconds.	0	0	0	0	0	22	36	58	Monthly	696
	Total Compliance Instances in Existing Regulation				880	Total Compliance Instances in Proposed Regulation				10440
	Increase in Compliance Instances									11.86 times

In view of the above facts, it is submitted that assessment and reporting on monthly basis and at State/UT level should not be proposed.



D. Monthly averaging in place of Quarterly averaging of benchmarks

- i. The proposed monthly Quality of Service (QoS) assessment by TRAI raises concerns due to its short intervals. Telecom services are subject to various external factors and operational challenges that can lead to short-term fluctuations. **Monthly averaging will inadvertently magnify these transient fluctuations, offering a distorted view of QoS.** Adopting a quarterly averaging approach provides a far more comprehensive picture by smoothing out these temporary fluctuations and capturing the broader trends in service delivery.
- ii. Furthermore, TSPs in India are upgrading their network to 5G. Thus, **the telecom industry in India is always operating in cycles influenced by technological upgrades, network expansions, and seasonal variations in demand. Quarterly averaging aligns with these operational cycles, making it a more pertinent timeframe for assessing the impact of infrastructure changes and upgrades on service quality.**
- iii. Hence it is submitted that quarterly averaging for computing the average quality of service parameters in the telecommunications sector is a statistically sound approach. The stability in sample size ensures reliable assessments by minimizing the impact of short-term fluctuations, yielding more robust averages. This stability is particularly crucial for quality of service parameters, providing a more accurate representation of overall performance.
- iv. Considering seasonal patterns is vital in the dynamic telecom industry, and quarterly averaging naturally account for fluctuations in demand or network usage. The resource efficiency of quarterly averaging is crucial for effective planning and allocation, avoiding unnecessary costs associated with monthly averaging.
- v. The long-term trend analysis supported by quarterly averages facilitates strategic planning and decision-making in the telecom sector. Monitoring data latency on a quarterly basis empowers TSPs to address persistent issues, leading to strategic improvements in network infrastructure over time.
- vi. **In light of the above we submit that quarterly averaging of QoS parameters will help TRAI in correctly assessing the QoS trends and take more informed decisions. Therefore, it is submitted that TRAI should continue with the present practice of quarterly averaging.**

E. Policy Stance

- i. In the past, TSPs have consistently expressed concerns about the numerous obstacles in the industry that hinder the establishment and maintenance of telecom infrastructure. Even when two locations share similar characteristics in terms of natural barriers, man-made obstacles, and external factors, ensuring consistent Quality of Service (QoS) remains a challenge for TSPs if there are no consistent policies governing the deployment of telecom infrastructure. In India, various impediments, such as stringent Electromagnetic Field (EMF) parameters, Right of Way (RoW) issues, and tower installation regulations, further complicate matters.



- ii. Therefore, **without a coherent and uniform policy framework, it is argued that setting QoS standards below the Local Service Area (LSA) level would be arbitrary** and against the provisions of the license agreement which are LSA based.
- iii. We **therefore humbly submit that any regulatory measures, prescriptions, or proposed benchmarks should be based on concrete real-world circumstances rather than mere hypotheses.**

F. TRAI's perception of degradation of service by the TSPs

- i. At the outset, we do not agree with the assumption that there is a degradation of service or that there is any variance in QoS reported and QoS experienced. Further, TRAI's unsubstantiated perception of telecom service degradation should not warrant making QoS benchmarks more stringent on TSPs. Below are the reasons for the same:
- ii. **Changing technology landscape:** The telecom industry is dynamic, with evolving technologies like 5G and ever-increasing customer expectations. What TRAI perceives as degradation might be a reflection of small number of customers not being able to experience new technology due to reasons other than failure on the part of TSPs. Stricter benchmarks may not account for these changes adequately.
- iii. **Economic implications:** Making benchmarks more stringent does not always improve the QoS and places unnecessary additional financial burden on TSPs and may impact roll-outs in areas where the benchmarks are difficult to meet. Investments required to meet tougher benchmarks could lead to increased costs, perhaps which may ultimately be passed on to consumers through higher tariffs.
- iv. **Innovation and Investment:** TSPs need room for innovation and investment in emerging technologies like 5G, and AI&ML. Overly stringent benchmarks could divert resources from these critical advancements to merely meeting regulatory requirements.
- v. **Localized Challenges:** Service quality can vary by region due to factors beyond TSPs' control, such as geography and population density, many of these reasons have been noted by the TRAI in its recent recommendations on providing connectivity in remote areas. Overly stringent benchmarks may not consider these localized challenges appropriately and may further impact roll-out in these areas.
- vi. In conclusion, the adjustment of QoS benchmarks to be more rigorous should be a carefully deliberated choice, considering the dynamic nature of the industry, its economic ramifications, the imperative for fostering innovation, and the delicate equilibrium between safeguarding consumers and fostering industry expansion. **Thus, any adjustment in QoS benchmarks, should be supported by a comprehensive Regulatory Impact Analysis to be carried out by the Authority.**

G. TSPs Network and Monitoring

- i. **Stability and Experience:** India's telecom industry has indeed come a long way and gained substantial experience over the years. The network infrastructure has been substantially upgraded, leading to improved stability and reliability. **Thus, the telecom networks in India are now mature. As a result, major outages and service**



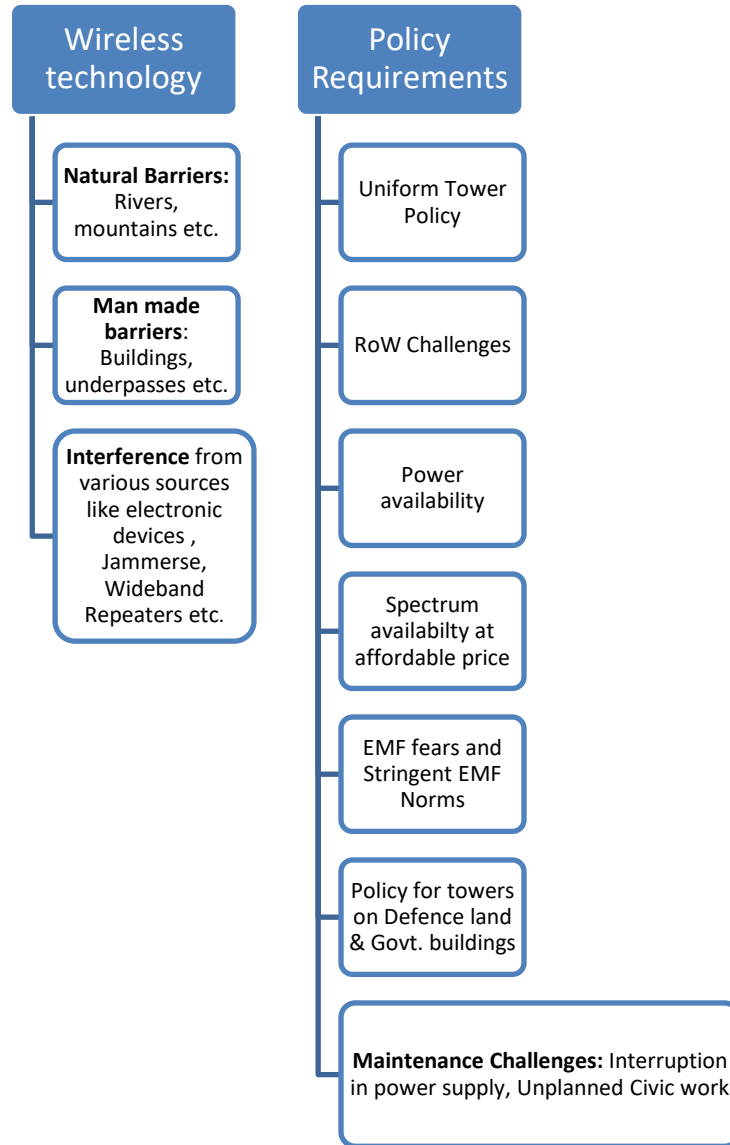
disruptions have become less frequent, reducing the need for constant monitoring in terms of basic network stability.

- ii. **Advanced Technology and Automation:** TSPs have adopted advanced technologies and automation tools to enhance network management. Predictive maintenance and AI-driven analytics are used to proactively identify and resolve network issues, reducing the need for continuous human intervention.
- iii. **5G Deployment:** It is important to note that the deployment of 5G infrastructure is under progress in India. The successful rollout of 5G services depends heavily on the support of both central and state governments in implementing various policies aimed at facilitating the deployment of 5G services across the nation.
- iv. **Fiberization:** Presently, major efforts are being made for the fiberization of towers in India, a critical factor for the efficient operation of 5G services. **Despite the government's efforts to amend the Right of Way (RoW) Rules to expedite the deployment of telecom infrastructure, implementation still faces challenges from local entities, municipal corporations, and wards.**
- v. **The existing gap between policy intentions and practical execution persists and must be significantly reduced to achieve the necessary objectives in a timely manner.** It is noteworthy that TRAI has not taken this factor into account in its proposal to revise the Quality of Service (QoS) Regulations.

H. Factors beyond the control of TSPs

- i. It is pertinent to note that our member operators have not received feedback on variance in the quality of service (QoS) and quality of experience (QoE). However, the QoE can be further improved by a focussed action on a multitude of factors, many of which are beyond the direct control of Telecom Service Providers (TSPs). Here, we will delve into some of these factors and their impact:
- ii. **Right of Way (RoW) Issues:** RoW issues refer to challenges related to acquiring permissions and access to public and private land for the installation of telecom infrastructure like cell towers and fiber-optic cables. TSPs often face bureaucratic hurdles, legal complexities, and local opposition when trying to expand their networks. These issues can lead to delays in network expansion and impact both QoS and QoE.
- iii. **Interference:** Interference from various sources, such as other wireless devices, weather conditions, and electromagnetic interference, can degrade signal quality and network performance. TSPs have limited control over external sources of interference, making it a significant challenge to maintain consistent QoS and QoE.

Figure 1: Technology and Policy Perspectives for deciding the granularity of QoS Parameters



- iv. **Infrastructure Vulnerabilities:** Fiber cuts, DG shutdowns etc., are common infrastructure vulnerabilities that can lead to network disruptions. These issues can result in accidental damage to fiber cables or hinder maintenance efforts, while DG shutdowns can affect network uptime during power outages. Addressing them collectively can enhance network resilience.
- v. **Handset Quality:** The quality of the end-user's handset or device plays a crucial role in the perception of QoE. TSPs cannot control the quality of devices used by their customers. Low-quality or outdated devices may experience more connectivity issues, dropped calls, and slower data speeds, negatively affecting the user's experience.
- vi. **Interference; illegal boosters:** The issue of interference and illegal boosters in the telecom industry remains a significant challenge that has not been fully resolved. This



issue impacts the network of TSPs in several ways, justifying the need for its resolution. Interference, often caused by unauthorized signal boosters and transmitters, can degrade network quality. It results in call drops, poor voice quality, slow data speeds, and reduced coverage. This directly affects the Quality of Service that TSPs can provide to their customers.

- vii. **Geographic and Environmental Factors:** Natural barriers such as mountains, forests, or urban density can impact signal propagation and network coverage. TSPs must adapt their network infrastructure to these geographic challenges, which can be costly and logistically challenging.
- viii. **Customer Density:** Areas with high population density can strain network resources, leading to congestion and reduced QoS during peak usage hours. TSPs must continually invest in network capacity to meet growing demands.
- ix. **Cost of the spectrum:** the cost of the spectrum (cost of acquisition) constitutes about 60% of the capital employed by the wireless segment.
- x. In summary, telecom **QoS and QoE are influenced by a complex interplay of factors, many of which TSPs cannot directly control. The above factors are critical and directly influence the QoS of the TSPs and should not be ignored while reviewing the parameters and its benchmarks by TRAI.**

I. EMF Related Challenges/ issues

- i. We want to highlight that the current EMF exposure limits in India are notably stricter (10 times) than the ICNIRP norms. This heightened stringency directly affects the Quality of Service in the telecom sector. There are various adverse consequences of these strict limits and the same are listed in the paras below.
- ii. **Lower Coverage:** To adhere to these stringent limits, telecom operators are required to deploy more towers/network elements with lower power output, leading to a denser network infrastructure. This not only leads to higher costs but also results in coverage gaps, particularly in rural areas. The installation of network infrastructure in uncovered areas becomes challenging due to approval delays and Right of Way (RoW) issues.
- iii. **Reduced Speed and Capacity:** Lower power output equates to lower signal strength, potentially leading to slower data speeds and reduced network capacity. The impact of EMF norms is particularly significant for 5G services, where seamless coverage with high-speed data services is crucial.
- iv. **Public Perception Challenges:** As a result of incorrect public perceptions, additional installations are often objected to by the public or Residents Welfare Associations (RWAs), negatively impacting the Quality of Service.
- v. **Challenges in 5G Rollout:** The implementation of 5G technology, which relies on higher frequency bands, may face additional difficulties due to the current EMF restrictions. This could adversely impact the QoS of 5G services.



J. Observations by Hon'ble SC in call drop matter:

- i. It is worth mentioning here that the Honorable Supreme Court has made the following observations on the Call Drop Regulation, which would be relevant for reviewing QoS parameters as well:
 - a) 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).
 - b) That while public interest is important, 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).
- ii. We hope that the Authority will take into account the above observations from the Hon'ble Supreme Court while reviewing the network-related QoS standards.

K. Network expansion vs. low ARPU – Rural and Difficult terrain areas

- i. **Low Revenue Potential:** The lower Average Revenue Per User (ARPU) in rural areas means that TSPs may struggle to generate sufficient revenue to justify the substantial investments required for network expansion and maintenance. Moreover, the return on investment in rural areas is not attractive because of higher capex, lower subscribers and low ARPU.
- ii. **Infrastructure Costs:** Building and maintaining network infrastructure in rural/hilly areas can be considerably more expensive than in urban areas. The cost of laying fiber optic cables, erecting cell towers, and providing electricity to remote sites can be prohibitively high, reducing the financial feasibility of stringent QoS investments.
- iii. **Operational Challenges:** Rural / Hilly areas may pose operational challenges such as logistical difficulties, higher maintenance costs, and greater vulnerability to natural disasters. These challenges can further deter TSPs from making substantial investments in network quality.
- iv. **Limited User Demand:** Rural areas may have a lower demand for advanced telecom services such as high-speed internet or 4G/5G connectivity compared to urban areas. TSPs may prioritize their investments based on where they see the greatest demand and potential for revenue growth.
- v. Stringent QoS norms and penalties will act as a disincentive to roll-out in rural areas and areas with tough terrain.

L. Resilience of telecom networks: Minimal impact on customer services despite a single cell outage.

- i. **Network Redundancy:** Modern telecom networks are engineered with redundancy and failover mechanisms. When one cell goes down, neighbouring cells and adjacent towers are designed to pick up the load seamlessly. This redundancy ensures that customers usually don't experience significant disruptions in their service.



- ii. **Coverage Overlap:** Telecom towers are strategically placed to overlap coverage areas. This overlap ensures that if one cell goes down, the adjacent cells can cover the affected area. Consequently, users might not even notice the outage, as their devices automatically connect to the next available cell with a strong signal.
- iii. **Service Resilience:** Voice and data services are designed to be robust. Even with one cell down, other infrastructure components, like core network elements, often remain operational. This redundancy ensures that essential services, such as emergency calls, can still be made.
- iv. Thus, we submit that TSPs understand that maintaining a consistent and high-quality service is vital to customer satisfaction. As a result, they invest heavily in network reliability and redundancy to ensure the best possible customer experience. It is pertinent to mention here that even though a cell may not be working, the services are still being provided to the customers and they are able to make calls and utilize mobile/data services which only reflects their perception of good service by the service provider. Hence, there is no justification for a high degree of Regulatory intervention by the Authority including micro/cell level monitoring of the Quality-of-Service parameters.
- v. **Force Majeure events:** We submit that the impact of Force Majeure events on compliance has been majorly ignored in the draft Regulations. We submit that exemption in compliance in this case should be applicable for all QoS parameters and associated benchmarks.
- vi. **Impact to older technologies:** TRAI has proposed DCR parameter technology wise. It is to bring to your attention that due to more and more roll-out of 4G networks, the 2G cells have a substantial ratio of cells with low traffic volumes. Due to such low volume of traffic handled by these older technologies, even a few call drops may reflect high call drop rate in those cells. Therefore, if 2G/3G performance is seen in isolation, it will show a comparatively higher call drop value as compared to technology agnostic or stand-alone 4G value. Also, consumers do not correlate call drops with any technology, be it 2G or 4G. Hence, the parameters should not be bifurcated on the basis of older and newer technologies otherwise, the older technologies will make TSP(s) as perpetual non-compliant on standalone basis.

M. Challenges faced in for North-East, Ladakh and difficult terrain areas.

- i. **Geographical Challenges:** These regions, including North-East and Ladakh, are characterized by rugged terrain, remote locations, and harsh weather conditions. Building and maintaining telecom network infrastructure in such areas is inherently more challenging and costly than in more accessible regions.
- ii. **Low Population Density:** Many difficult terrain areas have low population densities compared to urban centers. This means that the potential customer base is smaller, which can result in lower revenue generation for telecom operators.



- iii. **Limited Accessibility:** In many of these areas, road connectivity and access to basic utilities like electricity can be limited. This can impact the reliability of network infrastructure.
- iv. **Government Initiatives:** Governments often recognize the challenges of providing telecom services in remote and difficult terrain areas and may implement policies or incentives to encourage network expansion.
- v. **Customer Expectations:** Moreover, customers in these areas may have different expectations regarding network quality and service availability.
- vi. **Humanitarian and Strategic Considerations:** In some cases, telecom services in difficult terrain areas are critical for emergency response, national security, and disaster management. Ensuring reliable communication in these regions has broader humanitarian and strategic implications.
- vii. Hence progressively making QoS parameters more stringent over a period of time by the Authority may discourage and hamper investment and expansion of service in these areas.

N. Telecom Sector classification as an essential service

- i. The classification of the Telecom Sector as an essential service is imperative to ensure an uninterrupted power supply to this sector.
- ii. Additionally, prioritized Right of Way (RoW) approvals should be granted, facilitating swift deployment of telecom infrastructure. Further, States should actively engage in safeguarding telecom infrastructure to ensure its protection and continuity.

O. International Best Practices

- i. Our study on International Quality of Service (QoS) Practices demonstrates that developed nations opt for QoS monitoring over enforcing stringent compliances on Telecom Service Providers, thereby fostering a more adaptive and forward-looking regulatory environment. A table giving a comparison with other countries is enclosed as Annex.- 4.
- ii. Considering India's standing as one of the world's leading wireless telecom markets, it is important to draw comparisons with developed nations rather than developing countries for a better understanding of the approach to be adopted for India. **Thus, while formulating QoS Regulation in India, the Regulator should take into consideration best practices prevailing in developed countries.**
- iii. Considering the above we reiterate what we have stated earlier that:
 - In the short term, the **Authority may consider moving towards a light touch regulatory framework for QoS** i.e., only limited parameters should be measured and reported on a quarterly basis.



- **In the long-term, the Authority should deregulate the QoS parameters while maintaining the oversight** through drive tests and/or (a mix of) drive tests and 3rd party surveys.

Our question-wise response to the various questions raised by TRAI in the CP is given below:

Question-1: What are the possible reasons for increasing gaps between the QoS reported by the service providers and the QoS experienced by the consumers? How this gap can be bridged?

COAI response:

- a. We do not agree with the proposition that there is a gap in QoS reported and QoS experienced by the customers and that this gap is widening. We submit that there is no such gap and customer experience is as per the QoS reported to TRAI. Our member operators have wide and multi-level connect with the customers and have not received any such feedback at any level. Nevertheless, in case the Authority has collected any such data that shows that such gap exists and is widening, then the same is not evident from the details provided in the consultation paper. We would request the Authority to publish these details as an Addendum to the consultation paper and give us an opportunity to respond to the same.

Question-2: To support emerging applications and use cases please suggest a transparent framework for measurement and reporting of QoS and QoE especially in 4G and 5G networks considering relevant standards and global best practices.

COAI response:

- a. We submit that under the current prevailing QoS Regulations, the transparent framework for measurement and reporting of QoS and QoE is already established and there is no need for any more iterations in this aspect. Further, as the 5G use cases are still evolving and would be more evident in years to come once the coverage is more ubiquitous and stabilized, therefore, there is no need to make amendments at present. Globally, the best practice is to facilitate the organic growth of such services without encumbering these with QoS requirements.

Question-3: What should be the QoS parameters and corresponding benchmarks for ultra-reliable low latency communication (uRLLC), and massive machine type communications (mMTC)?

COAI response:

- a. The parameters for these technological advancements are still evolving and not settled. While the 3GPP Rel 15 has set the stage for reliability and latency and joint aspects under URLLC, the subsequent releases 16 and 17 have worked on various diverse aspects of the service, including the non-radio specific aspects like QoS Monitoring, Dynamic division of Packet Delay Budget, Packet Delay Budget (PDB) and enhancements of session continuity.



- b. The global best practices are to let the emerging applications and services evolve fully and let the processes and service offerings mature and be sufficiently prevalent in the markets before imposing any regulatory restrictions on these services. The Authority, itself has chosen not to regulate many nascent service offerings in the past. Further, being enterprise services, these will anyways be governed by service-level agreements. Therefore, we request the Authority to keep these services out of the QoS monitoring.

Question-4: Will there be any likely adverse impact on existing consumer voice(VoLTE/VoNR) and data services (eMBB) upon rollout of enterprise use cases of uRLLC or mMTC?

and

Question-5: If answer to Question-4 is 'No' then please explain how and if the answer is 'Yes' please suggest measures to ensure minimum guaranteed QoS for voice and data service for consumers.

COAI response:

- a. Under the modern 4G and 5G network architecture, the enterprise services are provided using technologies that ensure no impact on the generally available best effort internet. Therefore, , there will be no impact on consumer voice and data services, as these services will continue to be provided using the dedicated network resources for the same.

Question-6: To achieve QoS and QoE end-to-end, it is essential that all network segments deliver the minimum level of QoS required by respective service, application or use case. In this context, please suggest QoS parameters and corresponding benchmarks for National Long Distance (NLD) and International Long Distance (ILD) segments of the network with supporting global benchmarks.

COAI response:

- a. There is no global precedent of regulation or monitoring of QoS for carrier services. Therefore, we reiterate our submission that no change is required in this aspect. The carrier services i.e., NLD and ILD services work at agreed service level agreements (SLAs) and the competition in the carrier services market ensures that the SLAs are maintained, obviating the need for prescribing any additional regulation on NLD/ILD segments.

Question-7: What should be the approach for adoption of 'QoS by Design' framework by the service providers to ensure that new generation wireless networks are planned, implemented and maintained to deliver required level of measurable QoS and QoE?

COAI response:



- a. No network is designed to provide sub-optimum QoS. Further, the highest level of QoS and QoE is maintained to meet the expectations of the customers and to retain the customer in view of the competition in the market, where customer can switch network by simply generating a UPC. Therefore, 'Quality by Design,' is already the guiding design principles for telecommunication networks and there is no need for providing for the same through Regulations.

Question-8: What measures are required to accelerate the adoption of AI for management of QoE to reduce consumer complaints protectively and to enable near real time reporting of QoS performance to consumers?

COAI response:

- a. AI and ML are emerging technologies with evolving use cases that are being imbibed in operations, as and when found suitable. We can expect these technologies to become more sophisticated over the time, however, the same is expected to unfold organically, as inventions and innovations cannot be forced through regulations. Accordingly, we request for no intervention.

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Section-I PRELIMINARY					
1.					
2.	1. Short title, commencement, and application				
3.	1	1(2)	They shall come into force with effect from	<p>At the outset, we submit that the existing regulations should not be revised as the market has matured and TSPs have implemented the existing parameters in their systems for reporting to TRAI.</p> <p>The revised regulation should be implemented at least 5 years from the date of notification of the Regulations once the same is finalized.</p>	<p>We would like to submit that the draft regulation is infeasible to comply with, however, if TRAI does not consider suggested changes in the proposed regulation, we would like to submit as follows:</p> <p>a. The proposed revised Regulations would necessitate substantial alterations in the network and systems to enforce the revised QoS parameters. This process is highly time-consuming exercise as it involves obtaining desired output from the existing systems, upgrading them, ensuring data Integrity, its validation, etc. amongst many other audits and data curation exercises. All such activities would require a glide path of at least 5 years for integration of network and systems.</p> <p>b. Any immediate implementation in few quarters will cause disastrous impact to network, customer services and would even lead to withdrawal of older technologies like 2G causing service disruption to crores of subscribers.</p>

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					c. In view of the same, the revised regulation should be implemented phase-wise or provide glide path of at least 5 years from the date of notification of the Regulations once the same is finalized.
4.	1	1(3) (i)	These regulations shall apply to all service providers, having- (i) Unified Access Service License	It is suggested that non-level playing field be removed between different set of stakeholders providing communication services. .	a. The draft QoS regulation adds upon to the non-level playing field in the licensing and regulatory framework by making the QoS norms stringent for only cellular networks providing communication services.
5.	1	1(3) (ii)	(ii) Unified License with authorization for Access Service;		b. Internet Telephony services also compete with voice and messaging services provided under cellular networks by access licensees, however, QoS regulation is not being enforced on them.
6.	1	1(3)(iii)	(iii) Internet Service Authorisation under any License.		c. Further, OTT communication Services also provide similar services to that being provided by the TSPs but no such QoS regulation is applicable on them d. Hence, TRAI to ensure that non-level playing field be removed between different set of stakeholders providing communication services.

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7.	Section-II QUALITY OF SERVICE (QoS) PARAMETERS FOR ACCESS SERVICE(WIRELINE)				
8.	2. Quality of Service Parameters in respect of which compliance reports are to be submitted to the Authority				
9.	2	3(1)(i)	Provision of a service within 7 days of payment of demand note by the applicant Benchmark: 100% Average over a period: 1 Month	Should be removed from monitoring as redundant. If required can be kept part of perception of service parameters.	a. Currently, both wireline and wireless services are provisioned on demand basis, subject to technical feasibility and there is no need to monitor these legacy parameters. b. This parameter should be either completely removed or should be kept under perception of service parameters.
10.	2	3(1)(ii)	Fault incidences (No. of faults per 100 subscribers per month) Benchmark: ≤ 5 Average over a period: one month	We submit that Benchmark should be changed to ≤ 7. This parameter should be averaged on a quarterly basis and NOT monthly as proposed by TRAI. We do NOT agree with the monthly submission and suggest that the existing parameters and the benchmarks should continue as is on quarterly basis.	This benchmark for wireline services should be aligned with the current broadband service benchmarks, which are set at <7. This is required due to various challenges beyond TSPs control like: a. Difficult geographical characteristics of some regions preventing infrastructure deployment / rectification. b. Local community issues, including permissions and approvals, can impact the timely restoration of services.

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					<p>c. Re-establishing connectivity to the last mile, especially in remote or underserved areas, can be technically challenging.</p> <p>d. Interruptions in electrical supply can disrupt wireline services and affect fault resolution.</p> <p>e. Physical damage to fiber-optic cables, such as cuts, can lead to service interruptions and require time-consuming repairs.</p>
11.	2	3(1)(iii)	<p>Fault repair by next working day in Urban areas</p> <p>Benchmark: ≥ 85%</p> <p>Average Over a period: One month</p>	<p>This parameter should be averaged on a quarterly basis and NOT monthly as proposed by TRAI.</p> <p>We do NOT agree with the monthly submission and suggest that the existing parameters and the benchmarks should continue as is on quarterly basis.</p>	
12.	2	3(1)(iv)	<p>Fault repair within five days in Urban areas</p> <p>Benchmark: 100%</p> <p>Average Over a period: One month</p>	<p>Fault repair within seven working days in Urban areas.</p> <p>Benchmark should be 95%.</p> <p>This parameter should be averaged on a quarterly basis and NOT monthly as proposed by TRAI.</p>	<p>The 100% benchmark in 5 working days is over stringent. There are many issues that prevent 100% compliance, as mentioned above.</p> <p>Every timeline should be defined in working days.</p>

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				<p>We do NOT agree with the monthly submission and suggest that the existing parameters and the benchmarks should continue as is on quarterly basis.</p> <p>Every timeline should be defined in working days.</p>	
13.	2	3(1)(v)	<p>Fault repair by next working day in rural and hilly areas</p> <p>Benchmark: ≥ 75%</p> <p>Average over a period: One month</p>	<p>This parameter should be averaged on a quarterly basis and NOT monthly as proposed by TRAI.</p> <p>We do NOT agree with the monthly submission and suggest that the existing parameters and the benchmarks should continue as is on quarterly basis.</p>	
14.	2	3(1)(vi)	<p>Fault repair within seven days in rural and hilly areas</p> <p>Benchmark: 100%</p> <p>Average over a period: One month</p>	<p>Fault repair within seven working days in rural and hilly areas.</p> <p>Benchmark should be 95%.</p> <p>This parameter should be averaged on a quarterly basis and NOT monthly as proposed by TRAI.</p> <p>We do NOT agree with the monthly submission and suggest that the existing parameters and the</p>	<p>a. We recommend maintaining benchmarks at a 95% service restoration rate within 7 working days. This adjustment takes into account the practical constraints beyond the control of TSPs that may prevent achieving 100% compliance within specified time limits.</p> <p>b. It is also submitted that in a competitive market, the TSPs cannot and will not delay Fault repair</p>

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				<p>benchmarks should continue as is on quarterly basis.</p> <p>Every timeline should be defined in working days.</p>	intentionally, but unnecessarily harsh benchmarks that are technically unattainable at all times, can have the negative impact on roll-out in sparsely populated areas will limit revenue potential.
15.	2	3(1)(vii)	<p>Mean Time To Repair (MTTR)</p> <p>Benchmark: ≤ 10 hours</p> <p>Average over a period: One month</p>	<p>This parameter should be averaged on a quarterly basis and NOT monthly as proposed by TRAI.</p> <p>We do NOT agree with the monthly submission and suggest that the existing parameters and the benchmarks should continue as is on quarterly basis.</p>	
16.	2	3(1)(viii)	<p>Metering and billing accuracy – post paid</p> <p>Benchmark: ≤ 0.1%</p> <p>Average over a period: All Bills issued in the month</p>	<p>This parameter should be removed from monitoring and reporting under QoS Regulations.</p>	<p>a. Since, TRAI has already issued a separate regulation on Audit on Metering & Billing accuracy, covering audit of metering & billing accuracy, resolution of billing complaints, application of credit/waiver etc. related scenarios including complaints for both prepaid/postpaid. Therefore, it is suggested that this parameter should be removed from monitoring & reporting under the QoS Regulations.</p> <p>b. Further, in case TRAI continues with this parameter, it is suggested that</p>

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					the reporting should be based only on Quarterly average and not on monthly as propose by TRAI.
17.	2	3(1)(ix)	Metering and billing accuracy -- pre-paid Benchmark: ≤ 0.1% Average over a period: One month	This parameter should be removed from monitoring and reporting under QoS Regulations.	a. Since, TRAI has already issued a separate regulation on Audit on Metering & Billing accuracy, covering audit of metering & billing accuracy, resolution of billing complaints, application of credit/waiver etc. related scenarios including complaints for both prepaid/postpaid. Therefore, it is suggested that this parameter should be removed from monitoring & reporting under the QoS Regulations. b. Further, in case TRAI continues with this parameter, it is suggested that the reporting should be based only on Quarterly average and not on monthly as propose by TRAI.
18.	2	3(1)(x)	Resolution of billing/ charging complaints within six weeks Benchmark: 100% Average over a period: One month	This parameter should be removed from monitoring and reporting under QoS Regulations.	a. Since, TRAI has already issued a separate regulation on Audit on Metering & Billing accuracy, covering audit of metering & billing accuracy & credibility, resolution of billing complaints, application of credit/waiver etc. related scenarios including complaints for both prepaid/postpaid. Therefore, it is

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					<p>suggested that this parameter should be removed from monitoring & reporting under the QoS Regulations.</p> <p>b. Further, in case TRAI continues with this parameter, it is suggested that the reporting should be based only on Quarterly average and not on monthly as propose by TRAI.</p>
19.	2	3(1)(xi)	<p>Application of credit/ waiver/ adjustment to customer's account within one week from the date of resolution of complaints</p> <p>Benchmark: 100%</p> <p>Average over a period: One month</p>	<p>This parameter should be removed from monitoring and reporting under QoS Regulations.</p>	<p>a. Since, TRAI has already issued a separate regulation on Audit on Metering & Billing accuracy, covering audit of metering & billing accuracy, resolution of billing complaints, application of credit/waiver etc. related scenarios including complaints for both prepaid/postpaid. Therefore, it is suggested that this parameter should be removed from monitoring & reporting under the QoS Regulations.</p> <p>b. Further, in case TRAI continues with this parameter, it is suggested that the reporting should be based only on Quarterly average and not on monthly as propose by TRAI.</p>

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20.	2	3(1)(xii) (a)	Accessibility of call centre/ customer care Benchmark: ≥ 95% Average over a period: One month	This parameter should not be considered as part of QoS parameters for monitoring and reporting under QoS Regulations.	This parameter should be removed from monitoring due to the following reasons: a. No Impact on Service Quality: Human interface does not directly impact the quality of service provided by telecom service providers. b. Lack of International Standards: There are no standard international practices or established industry or country norms for monitoring such parameters. c. Technological Advancement: The rapid advancement of technology, including AI-driven automation, have reduced the need for traditional voice-based interactions. d. Automated Systems Enhancement: Automated systems have played a pivotal role in enhancing efficiency, providing 24/7 availability, scalability, and ensuring customer reliability, which complement human operator services. e. No comparable precedence in India: This parameter is neither monitored

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					nor enforced by any other regulator across various industries within the India or globally.
21.	2	3(1)(xii)(b)	<p>Percentage of calls answered by the operators (voice to voice) within ninety seconds.</p> <p>Benchmark: ≥ 95%</p> <p>Average over a period: One month</p>	Should not be considered as part of QoS KPIs to be monitored.	<p>This parameter should be removed from monitoring due to the following reasons:</p> <p>a. No Impact on Service Quality: Human interface does not directly impact the quality of service provided by telecom service providers.</p> <p>b. Lack of International Standards: There are no standard international practices or established industry or country norms for monitoring such parameters.</p> <p>c. Technological Advancement: The rapid advancement of technology, including AI-driven automation, have reduced the need for traditional voice-based interactions.</p> <p>d. Automated Systems Enhancement: Automated systems have played a pivotal role in enhancing efficiency, providing 24/7 availability, scalability, and ensuring customer reliability, which</p>

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					<p>complement human operator services.</p> <p>e. No comparable precedence in India: This parameter is neither monitored nor enforced by any other regulator across various industries within the India or globally.</p>
22.	2	3(1)(xiii)	<p>Termination/ closure of service within seven days</p> <p>Benchmark: 100%</p> <p>Average over a period: One month</p>	<p>Every timeline should be defined in working days.</p> <p>This parameter should be averaged on a quarterly basis and NOT monthly as proposed by TRAI.</p> <p>We do NOT agree with the monthly submission and suggest that the existing parameters and the benchmarks should continue as is on quarterly basis.</p>	
23.	2	3(1)(xiv)	<p>Refund of deposits within 45 days of closures</p> <p>Benchmark: 100%</p> <p>Average over a period: One month</p>	<p>Refund of deposits should be allowed within 60 working days of closures.</p> <p>This parameter should be averaged on a quarterly basis and NOT monthly as proposed by TRAI.</p> <p>We do NOT agree with the monthly submission and suggest that the</p>	<p>a. We recommend retaining the resolution period at 60 days. Our intention is to maximize our efforts to reach out to the customer and successfully refund their account.</p> <p>b. Reducing the number of days could negatively impact customer satisfaction, as we've observed</p>

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				existing parameters and the benchmarks should continue as is on quarterly basis.	that customers often take some time to respond. c. Therefore, maintaining a 60-day resolution period allows us to ensure the best possible customer experience.
24.	2	3(2)	The compliance of the parameters specified in sub-regulation (1) shall be reported to the Authority by the service provider.	The reporting period for these QoS parameters should be retained to Quarterly instead of Monthly. These parameters should not apply to connectivity solutions given to enterprise customers under wireline. An explicit clarification to this extent, should be provided by TRAI.	
25.	4. Quality of Service parameters in respect of which compliance is to be monitored by the service provider and reported to the Authority.				
26.	2	4(1)(i)	Registration of demand for new wireline connection irrespective of technical feasibility Benchmark: 100% Average over a period: One Quarter	Should not be considered as part of QoS KPIs to be monitored & reported.	This requirement will only increase compliance burden without significantly benefiting the consumers due to following reasons: a. Considering the high competition within the telecommunications sector TSPs are already actively expanding their wireline networks, contingent upon technical feasibility and commercial viability.

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					<p>b. Accumulating such details will pose significant challenges for service providers, particularly in areas where network expansion is not planned in the immediate future.</p> <p>c. The license does not mandate 100% roll-out, thus the requirements of mandating TSPs to register demand even in absence of technical feasibility is unnecessary and will not serve any purpose.</p> <p>d. Registering demand without any possibility of providing service can lead to unrealistic expectations and frustration among consumers.</p> <p>e. Further, the Department of Telecommunications (DoT), through the Sanchar Sarthi portal as part of Citizen Centric Services, is already working to provide consumers with information about the Internet Service Providers (ISPs) available in their respective areas, therefore to facilitate the collection of desired information in areas where no ISP is currently available, we propose that the Authority, either centrally or through a</p>

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					public entity like BSNL, establishes a short code accessible across all networks. This code would allow consumers to register their demands for services that fall outside the coverage of any service provider. Based on the volume of such requests, these can be considered for service provisioning under the Universal Service Obligation Fund (USOF). This approach would enable more efficient data collection and address the needs of underserved areas while minimizing the burden on individual service providers.
27.	2	4(1)(ii)	Requests for Shift of Telephone Connection to be attended within three days Benchmark: 95% Average over a period: One quarter	Should not be considered as part of QoS KPIs to be monitored & reported. In case TRAI retains this parameter, the same should be included as part of the perception of service parameters.	a. Shifting wireline connections within an extremely short timeframe, such as the stipulated 3 days, poses several challenges and complexities, as mentioned before. b. The Authority should strike a balance between ensuring prompt service and recognizing the limitations and challenges in providing wireline services.
28.	2	4(1)(iii)(a)	Junctions between local exchanges Benchmark: 0.002	Should not be considered as part of QoS KPIs to be monitored and reported.	a. We emphasize that the telecommunications industry has witnessed remarkable

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			Average over a period: One Quarter		<p>advancements, characterized by the widespread adoption of all IP-based networks and the deployment of highly advanced infrastructure. These technological strides have substantially enhanced the flexibility and capabilities of telecom networks.</p> <p>b. The relevance of these parameters may now vary significantly based on the network architecture in use. In contemporary IP-based networks, the traditional notion of "local exchanges" may no longer hold the same weight. The advent of IP-based networks and digital technology has supplanted many of the older analog and circuit-switched systems, resulting in a more adaptable and efficient infrastructure.</p> <p>c. Moreover, it's worth noting that TSPs are already actively monitoring and reporting Points of Interconnection (PoI) congestion. Consequently, the necessity of adhering to the conventional parameters has become increasingly obsolete.</p>
29.	2	4(1)(iii)(b)	Outgoing junctions from Trunk Automatic Exchange (TAX) to local exchange Benchmark: 0.005 Average over a period: One Quarter		
30.	2	4(1)(iii)(c)	Incoming junctions from local exchange to TAX Benchmark: 0.005 Average over a period: One quarter		
31.	2	4(1)(iii)(d)	Incoming or outgoing junctions between TAX Benchmark: 0.005 Average over a period: One Quarter		
32.	2	4(2)	The service provider shall monitor the compliance of the parameters and its benchmarks specified under sub-	1. This parameter should not apply to connectivity solutions given to enterprise customers under	

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			regulation (1) and furnish online quarterly report to the Authority within thirty days of the end of each quarter.	wireline. An explicit clarification to this extent, should be provided by TRAI. 2. Additional burden of reporting and any consequent financial disincentive should be removed.	

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1.	Section III QUALITY OF SERVICE (QoS) PARAMETERS FOR ACCESS SERVICE (WIRELESS)				
2.	1. Quality of Service Parameters in respect of which compliance reports are to be submitted to the Authority				
	A. Network Service Quality Parameters:				
	(i) Network Availability				
3.	3	6(1)(i) (a)	% of commissioned cells for which geospatial service coverage map is available on service provider's website. Benchmark:100% Method and Assessment Period: On average basis over a period of month.	This parameter should be removed. In case it is retained, there should be no benchmark and assessment period should be left to the discretion of TSPs.	<p>a. This parameter is already part of NIA, 2022 issued by DoT. This parameter is already part of NIA, 2022 issued by DoT. Hence, this parameter should be removed.</p> <p>b. Ensuring the 100% accuracy of the coverage map to consistently reflect real-time network coverage can be a complex task. Discrepancies may result in customer frustration, dissatisfaction, and an increase in complaints.</p> <p>c. Mandating updates to the map within a strict 2-week timeframe for any addition or removal of cells/sites presents operational challenges. Given the continuous expansion of the network, especially with the rollout of 5G, daily updates to the coverage map on the website may not be operationally feasible.</p>

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					<p>d. The potential for incorrect interpretation of coverage information, such as distinguishing between indoor and outdoor coverage or assessing signal strength, poses a challenge. Coverage maps often provide a high-level overview, which may not capture variations in signal strength, network congestion, or indoor coverage accurately.</p> <p>e. Large coverage maps with extensive data can lead to slow loading times, particularly on mobile devices, affecting the user experience.</p> <p>f. Instances may arise where a site or cell is technically live in the system but has been forcibly shut down due to local issues or disputes, leading to discrepancies between the map and the actual network status observed by the customer.</p> <p>g. Hence this parameter should be removed.</p> <p>h. Moreover, the Tarang Sanchar portal has details of all the sites of the service providers which can be</p>

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					accessed by the individuals for locating sites in any area.
4.	3	6(1)(i)(b)	Accumulated downtime (Cells not available for service) Benchmark: ≤ 1% Method and Assessment Period: On average basis over a period of month.	This parameter should <u>not be captured at the cell level</u>, rather the existing BTS level parameter should continue. This parameter should be averaged on a quarterly basis and NOT monthly as proposed by TRAI.	a. At the outset it's important to highlight that Cell outage does not translate to a network coverage outage. Further, it's significant to emphasize that even if a cell experiences an outage, it doesn't result in a denial of service.
5.	3	6(1)(i)(c)	Worst affected Cells due to downtime (Cells not available for service for more than cumulative 24 hrs. in a month) Benchmark: ≤ 1% Method and Assessment Period: On average basis over a period of month.	We do NOT agree with the monthly submission and suggest that the existing parameters and the benchmark of ≤ 2% should continue as is on quarterly basis.	b. Therefore, we do not agree with the Authority's rationale for revising the parameters from Base Station (BS) level to Cell level, citing that these parameters were prescribed in 2009 and that this level of granularity will address concerns related to the non-availability of cells degrading Quality of Service (QoS). c. We submit that measuring cell-level downtime may not accurately represent network availability and service providers service quality, as cell outages may not have a direct impact on services. d. In scenarios where one cell within a Base Transceiver Station (BTS) experiences downtime, the

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					<p>remaining cells within the same BTS can continue to serve the affected area. Therefore, it is incorrect to presume a lack of service availability if specific cells within a base station experience downtime especially in rural areas;</p> <p>e. We further submit that while proposing to make the benchmarks more stringent, the Authority has assumed that advancements in technology, the expansion of LTE and 5G networks, the introduction of advanced Operations and Maintenance (O&M) tools, improved power availability, and streamlined Right of Way (RoW) processes have substantially reduced the challenges associated with monitoring and maintaining networks. However, we believe that ground realities in many aspects continue to exhibit significant variation.</p> <p>f. There exist issues like frequent fiber cuts, non-availability of power and thefts, etc. that are beyond the control of the TSPs which makes it more cumbersome for the TSPs to achieve the already existing benchmarks.</p>

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					<p>g. It is also crucial to take into account the challenges and issues that service providers confront in ensuring network uptime, especially in remote service areas such as North East, Assam, Himachal Pradesh, Ladakh, etc.. The Authority is itself aware of these issues and has referred to the same in its recommendations on Improving Telecom Infrastructure in Northeastern States of India dated 22nd September 2023.</p> <p>h. Moreover, in many of the areas operation of DG sets is not allowed. This also hampers network performance.</p> <p>i. Thus, such severe changes will show the entire industry as non-compliant whereas presently the networks are compliant. .</p> <p>j. This parameter should not be captured at cell level rather the existing BTS level parameter should continue.</p>

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					k. Further, this parameter should be averaged on a quarterly basis and NOT monthly as proposed by TRAI.
6.	3	6(1)(i)(d)	<p>Reporting of significant network outage to the Authority within 24 hrs of start of the outage (Services not available in a district or State for more than 4 hours)</p> <p>Note: For significant network outages of > 24 hrs: Proportional rent rebate as per plan charges for affected number of days shall be credited in the next bill for post-paid consumers registered in the district. For the pre-paid consumers registered in the district, the validity of their pre-paid account as on outages start date shall be increased by equal number of days.</p> <p>Benchmark: 100%</p> <p>Method and Assessment Period: All incidence of significant network outage over a period of month.</p>	<ol style="list-style-type: none"> 1. Introducing this additional parameter as part of QoS reporting is unnecessary. 2. This should be part of reporting requirement and not a QoS parameter. 3. Sufficient and reasonable time of 1 week should be provided for such reporting. 4. The rent rebate provision should be dropped. 	<ol style="list-style-type: none"> a. TRAI has initially sought this information on need basis which is now being proposed to be part of the QoS Regulation and monitored by TRAI on monthly basis. b. We further submit that regarding the reporting of significant network outages lasting more than 24 hours, the Authority has already proposed QoS reports covering parameters such as Network availability, Connection Establishment, and Connection Maintenance, to be reported at the State, Union Territory along with LSA levels on monthly basis. c. We believe that such granular level reporting already encompasses the monitoring of significant network outages. TSPs are already obligated to comply with the Authority's directive dated 28th March 2023.

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					<p>d. Moreover, there are certain factors beyond the control of TSPs such as frequent power cuts, thefts of generators and petrol, Indian geography issues, fiber cuts etc. , which needs to be accounted for by TRAI before laying down this parameter.</p> <p>e. TSPs would be forced to withdraw their services from such areas of high network outage in case of Regulation and compensation being sought by TRAI in the proposed Regulations.</p> <p>f. Moreover, such rent rebate is technically possible in wireline where services are being provided at a fixed location, whereas, in case of cellular services, it will not be possible.</p> <p>g. Considering the above, introducing this additional parameter as part of QoS reporting is unnecessary, especially if it does not have a substantial impact on the quality of service provided to customers in general.</p>

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7.	3	6(1)(ii)(a)	<p>Call Set-up Success Rate for Circuit Switched Voice or Session Establishment Success Rate for VoLTE or DRB Accessibility success rate for VoNR, as applicable (within licensee's own network).</p> <p>Benchmark: ≥ 98%</p> <p>Method and Assessment Period: On average basis over a period of one month</p>	<p>The existing benchmark should prevail and no changes should be made to the benchmarks.</p> <p>This parameter should be averaged on a quarterly basis and NOT monthly as proposed by TRAI.</p> <p>We do NOT agree with the monthly submission and suggest that the existing parameters and the benchmarks should continue as is on quarterly basis.</p>	<p>a. The proposed benchmark has increased by more than 200%. All TSPs are meeting the existing benchmarks of the parameter.</p> <p>b. TRAI, in its consultation paper, has acknowledged upon analysis of past few PMRs that all the service providers are having much better performance than the current benchmark and in most cases, the benchmark of 98% CSSR has been achieved by the TSPs. It would be unfair to reward the Improved performance with a stringent benchmark.</p> <p>c. Hence, the existing benchmark should prevail and no changes should be made to the benchmarks.</p> <p>d. This parameter should be averaged on a quarterly basis and NOT monthly as proposed by TRAI.</p> <p>e. We do NOT agree with the monthly submission and suggest that the existing parameters and the benchmarks should continue as is on quarterly basis.</p>

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8.	3	6(1)(ii)(b)	SDCCH Congestion / Paging Channel Congestion/RRC Congestion Benchmark: ≤ 1% Method and Assessment Period: On average basis over a period of one month.	This parameter should be averaged on a quarterly basis and NOT monthly as proposed by TRAI. We do NOT agree with the monthly submission and suggest that the existing parameters and the benchmarks should continue as is on quarterly basis.	a. This parameter should be averaged on a quarterly basis and not on a monthly basis as proposed by TRAI. b. Averaging on monthly basis will unnecessarily increase non-compliance which will not give a true picture.
9.	3	6(1)(ii)(c)	Traffic Channel congestion i.e. TCH, RAB, E-EAB, EN-DC (E-UTRAN New Radio Dual Connectivity for NSA to access 4G and 5G both networks at same time) or DRB (Data Radio Bearer for SA) Congestion Benchmark: ≤ 2% Method and Assessment Period: On percentile basis over a period of one month		
10.	3	6(1)(iii)(a)(I)	Network QoS DCR Spatial Distribution Measure for Circuit Switched (2G/3G) network [CS_QSD(92, 92)] Benchmark: ≤ 2%	The existing parameter and its existing benchmarks should continue and should not be revised making it more stringent. Technology-wise Bifurcation of Parameter should be dropped.	a. We submit that the Authority has already established one of the most rigorous benchmarks along with a percentile-based calculation methodology for Network QoS Drop Call Rate (Spatial & Temporal Distribution Measures) parameters.

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			<p>Method and Assessment Period: On percentile basis over a period of one month</p>	<p>This parameter should be averaged on a quarterly basis and NOT monthly as proposed by TRAI.</p>	<p>b. Any further reduction in the percentage of days and cells in the calculation methodology, will make it exceptionally challenging and unachievable for TSPs to meet such stringent benchmarks, considering the operational challenges they face in running and maintaining vast networks.</p> <p>c. There is no precedence in any country where this parameter is captured to derive at QoS standards.</p> <p>d. These parameters and benchmarks are more theoretical and not practical in a real-time technology-agnostic network.</p> <p>e. The TSPs are already overburdened in extracting the data for the existing parameter and to meet it benchmark which are already very harsh.</p> <p>f. TRAI has carried out a quality assessment in five cities including Delhi. However, except for few non-critical observations in Delhi, all RF parameters assessed met the benchmarks.</p>
11.	3	6(1)(iii)(a)(II)	<p>Packet Switched (4G/5G and beyond) network [PS_QSD(96, 96)]</p> <p>Benchmark: ≤ 2%</p> <p>Method and Assessment Period: On percentile basis over a period of one month</p>	<p>We do NOT agree with the monthly submission and suggest that the existing parameters and the benchmarks should continue as is on quarterly basis.</p>	
12.	3	6(1)(iii)(b)(I)	<p>Network QoS DCR Temporal Distribution Measure for Circuit Switched (2G/ 3G) network [CS_QTD(97, 90)]</p> <p>Benchmark: ≤ 3%</p> <p>Method and Assessment Period: On percentile basis over a period of one month.</p>		
13.	3	6(1)(iii)(b)(II)	<p>Network QoS DCR Temporal Distribution Measure for Packet Switched (4G/5G and beyond) network [PS_QTD(97,96)]</p> <p>Benchmark: ≤ 3%</p> <p>Method and Assessment Period: On</p>		

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			percentile basis over a period of one month		<p>g. Further, this parameter cannot be used for actionable or network optimization.</p> <p>h. The mandate for QoS reporting and applicability of benchmarks at the State/UT level on a monthly basis makes it exceedingly difficult for TSPs to achieve the 96th percentile criteria, as they have a concession of only 1 day out of 30 days for network maintenance and restoration of such humongous networks.</p> <p>i. We submit that instead of solely focussing on problems related to call muting and muffling being caused by network reliability and maintainability, the Authority should also consider that these also depend on factors such as customers' location, distance from the network site, the number of connected users, the type of handset used, and usage patterns, whether it's steady or on-the-go.</p> <p>j. Further, various types of interference faced by TSPs such as from illegal repeaters, atmospheric ducting, etc.</p>

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					<p>that make it impossible for TSPs to achieve such benchmarks based on the revised calculation methodology. Hence, it is important to continue with the existing calculation methodology.</p> <p>k. Any further granularity and stringent calculation methodology associated with Financial disincentives can prevent network expansion in rural and remote areas.</p> <p>l. Impact of this revision would lead to entire industry becoming non-compliant to this parameter.</p> <p>m. Further, we would like to bring to your kind attention that while setting QSD, QTD thresholds in earlier regulation (2017), computation/assessment/validation was done for sample service areas, however, same has not been shared this time.</p> <p>n. Hence, it is suggested that the existing parameter and its existing benchmarks should continue and should not be revised making it more stringent.</p>

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					<p>o. We do NOT agree with the monthly submission and suggest that the existing parameters and the benchmarks should continue as is on a quarterly basis.</p> <p>Technology-wise Bifurcation of Parameter should be dropped:</p> <p>1. Due to many intrinsic factors, if performance of older technologies is seen in isolation, it will show a comparatively higher call drop value as compared to value derived from technology agnostic or stand-alone newer technology computation. Also, consumers do not correlate call drops with any technology, be it 2G or 4G.</p> <p>Similarly, even today when 5G has been implemented today the voice is going over 4G, and it doesn't invite any additional consumer concern.</p> <p>2. Therefore, the Dropped Call Rate (DCR) parameter should be technology agnostic i.e. performance for all technologies (2G, 3G, 4G, 5G) aggregated together.</p>

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14.	3	6(1)(iii) (c)	<p>Connections with good voice quality [Circuit Switched or Voice over LTE (VoLTE) or VoNR as applicable]</p> <p>Benchmark: ≥ 95%</p> <p>Method and Assessment Period: On average basis over a period of one month</p>	<p>This parameter should be averaged on a quarterly basis and NOT monthly as proposed by TRAI.</p> <p>We do NOT agree with the monthly submission and suggest that the existing parameters and the benchmarks should continue as is on quarterly basis.</p>	<p>a. The existing process has been well established and all TSPs have been scrupulously following the same. The systems have been designed to capture the data based on the parameters established by TRAI.</p> <p>b. Any revising in the same would require modifications in the existing systems, its testing and auditing to ensure compliance to the TRAI Regulations.</p> <p>c. Further, TSPs have been striving hard to adhere to the stringent norms as laid down by TRAI.</p> <p>d. Improved performance of the TSPs should not be leveraged to make the benchmarks more stringent.</p> <p>e. This parameter should be averaged on a quarterly basis and NOT monthly as proposed by TRAI.</p> <p>f. We do NOT agree with the monthly submission and suggest that the existing parameters and the benchmarks should continue as is on a quarterly basis.</p>

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15.	3	6(1)(iii)(d)	<p>DL Packet Drop Rate for Packet Switched Network (4G/5G and beyond) [DLPDR_QSD(96, 96)]</p> <p>Benchmark: ≤ 2%</p> <p>Method and Assessment Period: On percentile basis over a period of one month</p>	<p>1. These parameters should not be part of the regulation as the main parameter “DCR” is already included in the regulation.</p> <p>2. These parameters should be averaged on a quarterly basis and NOT monthly as proposed by TRAI.</p>	<p>a. Periodic data is already being submitted with TRAI.</p> <p>b. This parameter was introduced as part of QoS regulation parameter with the assumption that it has impact on voice service.</p> <p>c. Further, there are many technical parameters which are related to voice services and are only for engineering analysis and cannot be directly related to Drop Call Rate.</p>
16.	3	6(1)(iii)(e)	<p>UL Packet Drop Rate for Packet Switched Network (4G/5G and beyond) [ULPDR_QSD(96, 96)]</p> <p>Benchmark: ≤ 2%</p> <p>Method and Assessment Period: On percentile basis over a period of one month.</p>	<p>3. We do NOT agree with the monthly submission and suggest that the existing parameters and the benchmarks should continue as is on quarterly basis.</p>	<p>d. Further, TSPs have been striving hard to adhere to the stringent norms as laid down by TRAI.</p> <p>e. Improved performance of the TSPs should not be leveraged to make the benchmarks more stringent.</p> <p>f. Even the OEMs have shown their reluctance to capture these parameters as it would require various upgradation of the existing systems and counters for extracting the relevant data.</p> <p>g. There should not be any revision in the existing parameter which would</p>

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					<p>impact the industry by making it non-compliant to this parameter.</p> <p>h. Impact of this revision would lead to the entire industry becoming non-compliant to this parameter.</p> <p>i. Further, such parameters are not being monitored nor are these being reported in developed countries.</p>
17.	3	6(1)(iv)	<p>Successful SMS delivery within service provider's network in less than 20 seconds.</p> <p>Benchmark: ≥ 95%</p> <p>Method and Assessment Period: On percentile basis over a period of one month</p>	<p>This parameter should be removed from the draft Regulations</p>	<p>a. We submit that such a parameter is not required in the growing technical agnostic industry.</p> <p>b. There are various factors that impact the delivery of SMS such as no coverage area, customer handset issue, technical glitches, power outage, etc., beyond TSPs control.</p> <p>c. Further, there is no such parameter for OTTs providing similar service and hence this parameter should not be part of the Regulations.</p> <p>d. Reasons for delivery failure of SMS may include factors beyond the control of TSPs such as:</p>

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Sl. No.	Ch./Sec. No.	Regln. No. / Cl. No.	Proposed provision in Consultation Paper	Suggested modification	Justification / Global references with supporting data points if any.
					<p>i. Customer Unreachable: SMS delivery may fail when the customer's mobile phone is in a no-network zone (e.g., in-flight) or switched off or no-network coverage area etc..</p> <p>ii. Dual SIM Handsets: SMS delivery may be delayed until the customer is using the relevant SIM card (voice calls), especially in dual SIM handsets.</p> <p>iii. Non-Operational Numbers: Although an SMS is initiated by the user or the system, it may not be delivered if the recipient's number is not in use, disconnected, suspended, or in similar states.</p> <p>e. Moreover, there are different types of SMSs (P2P, A2P, P2A, I2P) also involving third parties using independent platforms. It is practically infeasible to measure and assure delivery of reports in 20 seconds because of dynamics involved in various types of SMS.</p>

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					f. In view of the same, it is suggested that this parameter should be removed from the draft Regulations.
18.	3	6(1)(v)	Metering and billing accuracy-post paid Benchmark: ≤ 0.1% Method and Assessment Period: All Bills issued in the month.	These parameters should be removed from monitoring and reporting under the proposed QoS Regulations,	a. Since, TRAI has already issued a separate regulation on Audit on Metering & Billing accuracy, covering audit of metering & billing accuracy, resolution of billing complaints, application of credit/waiver etc. related scenarios including complaints for both prepaid/postpaid. Therefore, it is suggested that this parameter should be removed from monitoring & reporting under the QoS Regulations.
19.	3	6(1)(vi)	Metering and billing accuracy-pre-paid. Benchmark: ≤ 0.1% Method and Assessment Period: One month		b. Further, in case TRAI continues with this parameter, it is suggested that the reporting should be based only on Quarterly average and not on monthly as proposed by TRAI.
20.	3	6(1)(vi)	Resolution of billing/ charging complaints within four weeks Benchmark: 100% Method and Assessment Period: One month	This parameter should be removed from monitoring and reporting under the proposed QoS regulations.	a. Since, TRAI has already issued a separate regulation on Audit on Metering & Billing accuracy, covering audit of metering & billing accuracy, resolution of billing complaints, application of credit/waiver etc. related scenarios including

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					<p>complaints for both prepaid/postpaid. Therefore, it is suggested that this parameter should be removed from monitoring & reporting under the QoS Regulations.</p> <p>b. Further, in case TRAI continues with this parameter, it is suggested that the reporting should be based only on Quarterly average and not on monthly as propose by TRAI.</p>
21.	3	6(1)(vi ii)	<p>Application of credit/ waiver/ adjustment to customer's account within one week from the date of resolution of complaints.</p> <p>Benchmark: 100%</p> <p>Method and Assessment Period: One month</p>	<p>This parameter should be removed from monitoring and reporting under the proposed QoS regulations.</p>	<p>a. Since, TRAI has already issued a separate regulation on Audit on Metering & Billing accuracy, covering audit of metering & billing accuracy, resolution of billing complaints, application of credit/waiver etc. related scenarios including complaints for both prepaid/postpaid. Therefore, it is suggested that this parameter should be removed from monitoring & reporting under the QoS Regulations.</p> <p>b. Further, in case TRAI continues with this parameter, it is suggested that the reporting should be based only on Quarterly average and not on monthly as propose by TRAI.</p>

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22.	3	6(1)(ix)(a)	<p>Response Time to the customer for assistance Accessibility of call center/ customer care.</p> <p>Benchmark: ≥ 95%</p> <p>Method and Assessment Period: One month</p>	<p>It is suggested that this parameter should be completely removed from the Draft Regulations.</p>	<p>This parameter should be removed from monitoring due to the following reasons:</p> <p>a. No Impact on Service Quality: Human interface does not directly impact the quality of service provided by telecom service providers.</p> <p>b. Lack of International Standards: There are no standard international practices or established industry or country norms for monitoring such parameters.</p> <p>c. Technological Advancement: The rapid advancement of technology, including AI-driven automation, have reduced the need for traditional voice-based interactions.</p> <p>d. Automated Systems Enhancement: Automated systems have played a pivotal role in enhancing efficiency, providing 24/7 availability, scalability, and ensuring customer reliability, which complement human operator services.</p>
23.	3	6(1)(ix)(b)	<p>Response Time to the customer for assistance percentage of calls answered by the operators (voice to voice) within ninety seconds.</p> <p>Benchmark: ≥ 95%</p> <p>Method and Assessment Period: One month</p>		

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					e. No comparable precedence in India: This parameter is neither monitored nor enforced by any other regulator across various industries within the India or globally.
24.	3	6(1)(xi)	<p>Refund of deposits within 45 days after closures.</p> <p>Benchmark: 100%</p> <p>Method and Assessment Period: One month</p>	<p>There should not be any changes in the existing parameter i.e. refund of deposits within 60 days after closures.</p> <p>This parameter should be averaged on a quarterly basis and NOT monthly as proposed by TRAI.</p> <p>We do NOT agree with the monthly submission and suggest that the existing parameters and the benchmarks should continue as is on quarterly basis.</p>	<p>a. Refunds are initiated after the billing cycle of the customer which is generally at the month end. Adjustment of the invoiced amount is carried out wherever applicable for initiating the refunds of the balance amounts to the customers.</p> <p>b. TSPs make several attempts to refund the deposits of the customer in case of failure in the initial attempts.</p> <p>c. There could be various customer related issues for such failures like customer not available, change of address which has not been updated with the TSP, etc.</p> <p>d. Hence, there would always be few cases which would not get closed within the 45 days timeframe. It is therefore suggested that the timeframe for refund be kept to 60 days and not revised to 45 days.</p>

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					<p>e. All such attempts are time-consuming and reducing the time period for such refunds would be considered by the customer as misappropriation of their deposits with the TSPs, who would be bound to deposit such funds with CUTCEF.</p> <p>f. This would cause inconvenience to the customers as they would have to approach TRAI for seeking their refund of deposits .</p> <p>g. It is suggested that there should not be any changes made to this parameter.</p>
25.	7. Quality of Service parameter in respect of which compliance is to be monitored by the service provider and reported to the Authority				
26.	3	7(1)(1)	<p>Registration of demand for wireless services in case services cannot be provided due to non-availability of wireless service.</p> <p>Benchmark: 100%</p> <p>Method and Assessment Period: One quarter</p>	This parameter should be removed from the draft Regulations	<p>a. There is no provision to capture such registration in any area which is not serviced by a TSP. Hence, in such areas, no QoS parameters can be captured.</p> <p>b. The network expansion is carried out by the TSPs based on the techno-commercial feasibility and priority.</p> <p>c. Further this parameter should not be part of the QoS and should therefore</p>

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Sl. No.	Ch./Sec. No.	Regln. No. / Cl. No.	Proposed provision in Consultation Paper	Suggested modification	Justification / Global references with supporting data points if any.
					be removed from the proposed Draft QoS Regulations.
27.	3	7(1)(2)(i)	<p>Service Coverage</p> <p>Benchmark: Signal strength at street level shall be as specified in TSTP for rollout obligation issued by the Central Government for respective technology.</p> <p>Method and Assessment Period: One quarter</p>	This parameter should be dropped from the draft regulation.	<p>a. This parameter is part of the licensing norm.</p> <p>b. It will not be appropriate if the same topic is regulated by both Licensor and TRAI. Hence, this provision should not be part of QoS regulation.</p> <p>c. We suggest this parameter should not be considered as part of QoS monitored and reported rather this can continue to be part of perception of service parameters in view of the following;</p> <p style="padding-left: 20px;">i. TSPs are already complying to the TEC standards related to service coverage and signal strength at different levels (outdoor/indoor/in-vehicle) and same are duly verified by the LSA Units of DoT at the time of verifying and certifying compliance of roll-out obligations by TSPs in adherence to license conditions and NIA for spectrum auction.</p>

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Sl. No.	Ch./Sec. No.	Regln. No. / Cl. No.	Proposed provision in Consultation Paper	Suggested modification	Justification / Global references with supporting data points if any.
					<ul style="list-style-type: none"> ii. Further, measuring in-vehicle and indoor signal strength accurately can be technically complex. Indoor signal strength can vary widely depending on the building's size, construction, and location or below ground level. It may not be practical to set uniform benchmarks for all indoor environments. iii. Customers have the option to choose from available solutions such as In-Building Solutions (IBS), Wi-Fi calling, Offloading data through Cellular Enhancement Products (ODCEP), Fixed Wireless Access (FWA), and more to improve their indoor coverage. iv. In a competitive telecom market, service providers have an incentive to improve indoor coverage to attract and retain customers. Market forces might be sufficient to drive investments in this area without the need for regulatory mandates. Rather, regulatory authorities may encourage the adoption of such

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					<p>technologies to enhance overall network quality and customer satisfaction.</p> <p>v. Further, for operator-assisted drive tests, a Signal-to-Noise plus Interference Ratio (SNIR) value greater than -6 should be considered, compared to the current practice, where many good samples with SINR values greater than 0 are left out and cannot be measured for LTE and advanced networks. We recommend that our earlier submissions be taken into account when finalizing the new QoS regulations in this regard.</p>
28.	3	7(1)(3)	<p>Point of Interconnection (POI) Congestion for interconnection with circuit switched network(2G/3G) (on individual POI) at LSA level.</p> <p>Benchmark: ≤0.5%</p> <p>Method and Assessment Period: On average basis over one quarter.</p>	<p>This parameter should be removed from proposed regulation.</p> <p>Any bifurcation of parameter based on technologies should be removed from the draft regulation.</p>	<p>a. We reiterate that, as of the current state, these parameters can only be measured within the individual service provider networks and not between different service providers. Thus, end to end measurement of these parameters across operators, irrespective of the type of POI (IP or TDM), is not technically feasible.</p>
29.	3	7(1)(4)	<p>Point of Interconnection (POI) performance for interconnection</p>		<p>b. Also, the POIs for voice calls are technology neutral and do not</p>

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			<p>between packet switched networks(4G/5G) at LSA level.</p> <p>(i) Benchmark: Latency<30ms (ii) Jitter<20ms (iii) Packet loss<1%</p> <p>Method and Assessment Period: On average basis over one quarter.</p>		<p>cater specifically to 2G/3G traffic or 4G/5G traffic. Any bifurcation of parameter based on technologies should be removed from the draft regulation.</p> <p>c. Hence this parameter should be removed from QoS reporting and Benchmark.</p>

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Sl. No.	Ch./Sec. No.	Regln. No. / Cl. No.	Proposed provision in Consultation Paper	Suggested modification	Justification / Global references with supporting data points if any.
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1.	Section IV QUALITY OF SERVICE (QoS) PARAMETERS FOR BROADBAND SERVICE (WIRELINE AND WIRELESS)				
2.	1. Quality of Service Parameters for which compliance reports are to be submitted to the Authority				
3.	4	9(1) (1)	<p>Latency</p> <p>Benchmark (Wireless): <100 ms (in 4G and 5G network)</p> <p>Benchmark (Wireline): < 50ms</p> <p>Method and Assessment</p> <p>Period: On average basis over a period of one month</p>	<p>We submit that the benchmark of latency for Wireless services should be reduced in a phase-wise manner over a period of the next few years i.e. reduce the threshold from current value of 250 ms to 200 ms and then to 150 ms gradually and for Wireline Services should be <120 ms.</p> <p>This parameter should be averaged on a quarterly basis and NOT monthly as proposed by TRAI.</p> <p>We do NOT agree with the monthly submission and suggest that the existing parameters and the benchmarks should continue as is on quarterly basis.</p>	<p>a. While revising the benchmarks, the Authority has referred to international examples where individual telecom service providers have achieved ultra-low latency. However, it's essential to note that such stringent benchmarks have not been widely prescribed by regulators worldwide.</p> <p>b. Moreover, we believe that the achievement of such benchmarks should primarily be driven by market forces to attract and retain customers.</p> <p>c. When recommending these stringent benchmarks, the Authority should also consider various operational challenges and factors:</p> <p>i. Backhaul Network Challenges: Achieving higher benchmarks, regardless of deploying advanced packet core networks with LTE, LTE-Advanced, or 5G technology,</p>

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					<p>depends on the quality and capacity of the backhaul network. Challenges such as challenging terrain, Right of Way (RoW) issues, the cost of fiberizing base transceiver stations (BTS), local issues, and more can impact network performance.</p> <p>ii. Routing Variations: Depending on route occupancy and network conditions, traffic may take different paths, such as the shortest or longest route. This variation in routing can lead to latency differences.</p> <p>iii. Submarine Cable Damage: In the event of damage to submarine cables or major fiber cuts, traffic may be rerouted through alternative paths, resulting in higher observed latency.</p> <p>iv. Network Congestion: High numbers of connected users and a vast subscriber base, especially when compared to other nations, can lead to</p>

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Sl. No.	Ch./Sec. No.	Regln. No. / Cl. No.	Proposed provision in Consultation Paper	Suggested modification	Justification / Global references with supporting data points if any.
					<p>network congestion, resulting in higher observed latency.</p> <p>v. Interference: Wireless networks, in particular, can suffer from interference, leading to latency variations. Interference may arise from physical obstacles, competing wireless signals, or environmental factors.</p> <p>vi. Cloud-Based Services: The use of cloud-based services can introduce additional latency, as data needs to travel to and from remote cloud servers. The geographical location of these servers can impact latency.</p> <p>vii. Decisions outside purview of TSP- It is pertinent to mention here that in many cases the decisions taken by non-licensees like CDN providers also affect the latency. For instance, a content provider's decision to have or not have CDN in a TSPs network will impact the latency.</p>

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Sl. No.	Ch./Sec. No.	Regln. No. / Cl. No.	Proposed provision in Consultation Paper	Suggested modification	Justification / Global references with supporting data points if any.
					<p>viii. Security Measures: Security measures like firewalls, intrusion detection systems, and encryption can introduce processing delays, affecting overall latency.</p> <p>d. Given that latency is measured from the user reference point at the Point of Presence (POP) or Internet Service Provider (ISP) gateway node to the international gateway (IGSP/NIXI), we recommend maintaining the same benchmarks as <250ms for wireless networks and <120ms for wireline networks.</p>
4.	4	9(1)(2)	<p>Jitter</p> <p>Benchmark (Wireless): ≤ 50ms (in 4G and 5G network)</p> <p>Benchmark (Wireline): ≤ 40</p> <p>Method and Assessment Period: On average basis over a period of one month</p>	<p>This parameter should be removed from the proposed Draft Regulations.</p>	<p>a. Jitter is a measure for variance in latency and this micro-level parameter is used for fault analysis only, whereas latency is a self-sufficient parameter which gives insight of QoE of the user.</p> <p>b. Generally such micro-level data is used for dip-stick testing and not on a regular basis.</p> <p>c. Therefore, this parameter does not serve any purpose and should be removed from the Regulations.</p>

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Sl. No.	Ch./Sec. No.	Regln. No. / Cl. No.	Proposed provision in Consultation Paper	Suggested modification	Justification / Global references with supporting data points if any.
5.	4	9(1)(3)	<p>PDP context activation success rate for wireless data service.</p> <p>Benchmark (Wireless): ≥ 95%</p> <p>Benchmark (Wireline): -</p> <p>Method and Assessment Period: On average basis over a period of one month</p>	<p>We submit that as a broader principle/ approach, in the short term, the Authority may consider moving towards a light touch regulatory framework for QoS. In the long-term, the Authority should deregulate the QoS parameters while maintaining the oversight.</p> <p>Thus, this parameter should not be mandated and should be removed from the proposed Draft Regulations.</p> <p>In case TRAI retains this parameter, it should be assessed on a quarterly basis instead of a monthly basis.</p>	<p>a. For capturing the data and measurement of the same, the ISP location is required and accessed. The same is not in the control of TSPs.</p> <p>b. Further, the measurement methodology prescribed in the Consultation Paper is not relevant to the TSPs rather the same falls under ISPs domain.</p> <p>c. In view of the above, it is suggested that these parameters should be removed from the Regulations.</p>
6.	4	9(1)(4)	<p>Packet drop rate</p> <p>Benchmark (Wireless): ≤ 2%</p> <p>Benchmark (Wireline): ≤ 1%</p> <p>Method and Assessment Period: On average basis over a period of one month</p>	<p>This parameter should be averaged on a quarterly basis and NOT monthly as proposed by TRAI.</p> <p>We do NOT agree with the monthly submission and suggest that the existing parameters and the benchmarks should continue as is on a quarterly basis.</p>	<p>a. The proposed benchmark has changed from 5% to 2% making it stringent by 60% without considering ongoing issues of Interference, Atmospheric ducting, low coverage in rural pockets where inter-site distance is high nor geographical challenge is not considered for JK, NE, MP/CG, HP, UK.</p> <p>b. Hence, it is advised that existing benchmarks should continue and not revised.</p>

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Sl. No.	Ch./Sec. No.	Regln. No. / Cl. No.	Proposed provision in Consultation Paper	Suggested modification	Justification / Global references with supporting data points if any.
7.	4	9(1)(5)	<p>Minimum download and upload speed against the minimum subscribed speed in offered data plans.</p> <p>Benchmark (Wireless): >80% of the minimum speed</p> <p>Benchmark (Wireline): 100% of the minimum speed.</p> <p>Method and Assessment Period: On average basis over a period of one month</p>	<p>We submit that as a broader principle/ approach, in the short term, the Authority may consider moving towards a light touch regulatory framework for QoS. In the long-term, the Authority should deregulate the QoS parameters while maintaining the oversight.</p> <p>Thus, this parameter should not be mandated and should be removed from the proposed Draft Regulations.</p>	<p>a. Regarding the minimum download speed for wireless networks, we would like to emphasize that neither TSPs prescribe any minimum download speed nor is it possible to guarantee any minimum speed in the case of wireless networks.</p> <p>b. TRAI has their own TRAI MySpeed app which the customers can utilize to measure the data download / upload speed.</p> <p>c. The speed experienced by a customer on a wireless network depends on various factors, including the customer's handset, location (indoor or outdoor), distance from the cell site, the number of connected users, the type of website or app being accessed, whether the website is on IPv6 or IPv4, topography, backhaul connectivity, various topographical issues and much more. These factors are not under the control of telecom service providers.</p> <p>d. Moreover, it is pertinent to note such a parameter is not consumer oriented</p>
8.	4	9(5)	<p>Every service provider shall, in all its Internet service plans, indicate the minimum download and upload speed available to the consumers.</p>		

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					<p>nor is consumer friendly as it does not serve any purpose.</p> <p>e. In view of the same, this parameter is not required in the Regulations and should be removed.</p> <p>f. Further, for the benchmarks of 100% for the minimum download speed in the case of wireline networks, the calculation methodology appears to be erroneous. The authority is proposing 100% benchmarks based on the average of the lower 10% of all respective test calls. This approach seems incorrect if the benchmark is set at 100%.</p> <p>g. Nevertheless, considering the challenges highlighted for network latency and its applicability to wireline networks where the speed observed may exhibit some variation, we recommend that the authority retains the existing benchmarks of >80% in the case of wireline networks. The reporting of the same should continue to be on Quarterly basis instead of Monthly as proposed by TRAI.</p>

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Sl. No.	Ch./Sec. No.	Regln. No. / Cl. No.	Proposed provision in Consultation Paper	Suggested modification	Justification / Global references with supporting data points if any.
9.	2. Quality of Service Parameters in respect of which compliance is to be monitored by the service provider and reported to the Authority:				
10.	4	10(1)(i)	<p>Registration of demand for new wireline broadband connection irrespective of technical feasibility.</p> <p>Benchmark (Wireless): -</p> <p>Benchmark(Wireline): 100%</p> <p>Averaged/ measured over a period: One month</p>	This parameter should not be mandated and should be removed from the proposed Draft Regulations.	<p>a. TSPs pitch their services only in areas where they have network coverage.</p> <p>b. Currently none of the TSPs have provision to register any demand for new wireline broadband connectivity in their non-coverage areas.</p> <p>c. Further, based on techno-commercial feasibility, the TSPs expand and provide their network services.</p> <p>d. Hence, maintaining a demand register in non-coverage areas is not required and should be removed from the Regulations.</p>
11.	4	10(1)(i)	<p>Successful packet data transmission download attempts</p> <p>Benchmark (Wireless): > 80%</p> <p>Benchmark(Wireline): > 95%</p> <p>Averaged/ measured over a period: One month</p>	This parameter should be removed from the proposed Draft Regulations.	<p>a. For a meaningful data to be collated, the same would require home-to-home checking of the data transmission.</p> <p>b. This is practically not possible.</p> <p>c. For any such data transmission speed, there already exists TRAI MySpeed app which the customers</p>

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Sl. No.	Ch./Sec. No.	Regln. No. / Cl. No.	Proposed provision in Consultation Paper	Suggested modification	Justification / Global references with supporting data points if any.
12.	4	10(1)(i) ii)	Successful packet data transmission upload attempts Benchmark (Wireless): > 75% Benchmark(Wireline): > 90% Averaged/ measured over a period: One month		can use to analyse the download and upload speed of their data. d. Hence, these parameters should be removed from the Regulations.
13.	4	10(1)(i) v)	Maximum Bandwidth utilization of any Customer serving node to ISP Gateway Node [Intra-network] or Internet Exchange Point Link(s) Benchmark (Wireline and Wireless): < 80% link(s)/route bandwidth utilization during peak hours (TCBH) Averaged/ measured over a period: One month	This parameter should be removed from the proposed Draft Regulations.	a. The CP does not provide enough clarification on this parameter. b. There are many links involved in service delivery and measurement of traffic on each of the links is not possible. c. Further, this is in the purview of network design and should not be part of the purview of QoS. d. Hence, it is suggested that this parameter should be removed from the Regulations.

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Sl. No.	Ch./Sec. No.	Regln. No. / Cl. No.	Proposed provision in Consultation Paper	Suggested modification	Justification / Global references with supporting data points if any.
14.	SECTION V CUSTOMER PERCEPTION OF QUALITY OF SERVICE				
15.	11. Quality of Service Parameters for customer perception of service:				
16.	5	11	The performance of the service providers in respect of benchmarks of each of the following QoS parameters for the access service (wireline), access service (wireless), Broadband service (Wireline) or Broadband Service (Wireless), as the case may be, shall be subject to periodic assessment by the Authority through customer satisfaction surveys, which may be conducted by the Authority either through its own officers or employees or through any agency appointed by it.	This parameter should not be mandated and should be removed from the proposed Draft Regulations	<ul style="list-style-type: none"> a. Establishing a benchmark is not feasible, as relying on survey-based perceptions may not yield clear data. This holds true for both scenarios, whether the customer is selected randomly or from the same geographical area, such as in the case of an area affected by ducting issues. b. Since QoS KPI reporting is being carried out, there should be no reliance on survey benchmarks. c. Feedback should be derived from survey reports. d. Section 11(1)(v)(b) of the TRAI Act, 1997 gives the power to the Authority to carry out surveys from time to time. e. Hence, we submit that the proposed parameter be removed from the draft regulation.
17.	5	11(a)	customers satisfied with the provision of service		<ul style="list-style-type: none"> a. The parameter and its benchmark can be studied through surveys

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			Benchmark: ≥ 90 %	These parameters should not be mandated and should be removed from the proposed Draft Regulations	only and do not provide a true and clear measurable value. b. Since this is subjective, hence setting benchmarks is not required. c. Further, these parameters should NOT be prescribed as QoS Benchmarks. d. These can be analysed as a part of the survey conducted by TRAI.
18.	5	11(b)	customers satisfied with the billing performance. Benchmark: ≥ 95 %		
19.	5	11(c)	customers satisfied with network performance, reliability and availability. Benchmark: ≥ 95 %		
20.	5	11(d)	customers satisfied with maintainability. Benchmark: ≥ 95 %		
21.	5	11(e)	customers satisfied with supplementary and value added services. Benchmark: ≥ 90 %		
22.	5	11(f)	customers satisfied with help services including customer grievance redressal. Benchmark: ≥ 90 %		

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Sl. No.	Ch./Sec. No.	Regln. No. / Cl. No.	Proposed provision in Consultation Paper	Suggested modification	Justification / Global references with supporting data points if any.
23.	5	11(g)	customers satisfied with overall service quality Benchmark: ≥ 90 %		
24.	SECTION VI RECORD KEEPING, REPORTING AND PUBLICATION OF QUALITY OF SERVICE PERFORMANCE				
25.	13. Reporting				
26.	6	13(1)	Every service provider shall create secure online system within six months of notification of these regulations for collection of primary data, its processing, generation and submission of online compliance reports to the Authority with online access of required supporting primary data in respect of each QoS parameters specified under regulation 3 , regulation 4, regulation 6, regulation 7, regulation 9 and regulation 10 in such manner and format, at such periodic intervals and within such time limit as may be specified by the Authority, from time to time, by an order or direction.	These parameters should not be mandated and should be removed from the proposed Draft Regulations The regulation should only mandate providing the report (processed data) through online access. The requirement to provide primary/raw data should be dropped.	<ul style="list-style-type: none"> a. QoS PMR reports primary data are automated but complete PMR automation is not possible due to technical issues. b. It must be noted that KPIs are made after the extraction of lot of data and evaluating the same. c. We submit that the process of generation of reports requires manual, semi-manual and automation work as well as requires data curation which is a cumbersome task. d. Raw reports and coding needs to be verified and issues if any, needs to be rectified. e. One touch reporting output is not possible due to the above factors.

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					<p>f. The format in which the authority demands is not feasible for TSPs to submit in.</p> <p>g. Hence this requirement should be removed from the Regulations.</p>
27.	6	13(2)	<p>The benchmark of each QoS parameters specified in sub-regulation (1) shall be measured, reported, and complied at State or Union Territory (UT) and License Service Area level, as may be specified by order or direction issued by the Authority time to time: Provided that the Authority may notify list of districts and QoS parameters for measurement, reporting and compliance of QoS benchmarks based on identification of areas experiencing degraded QoS.</p>	<p>The provision for state/UT level should be dropped. The parameter of reporting should continue at LSA level.</p>	<p>a. The systems and processes of the TSPs have been aligned based on LSA-wise reporting and as per the license issued by DoT.</p> <p>b. Any modifications in the reporting and extraction of data apart from the existing criteria would require alterations in the systems and process which is a humongous task which would involve manpower and financial requirements.</p> <p>c. The proposed parameter is noteworthy for its divergence from the licensing framework, and it contradicts the network design established at LSA by the TSPs.</p> <p>d. There are certain cities/states which are covered under different LSA and States. For example, Noida & Gurgaon fall in Delhi LSA</p>

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					<p>but in the States of U.P and Haryana respectively.</p> <p>e. In this case, levy of penalty say for a instance of non-compliance in Noida, the penalty might get levied for the LSA of Delhi and State of U.P. as well, thereby leading to dual levy of penalty.</p> <p>f. It is therefore suggested that the prevailing reporting at LSA level be continued.</p>

S No.	QoS Parameter	Position in India	Position in USA	Position in UK	Position in Canada	Position in Australia	Position in EU
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Quality of Service Parameters for Access Service (Wireless)							
1.	% of commissioned cells for which geospatial service coverage map is available on service provider's website. Benchmark:100%	To be provided	We did not find any provision which mandates publishing of coverage maps as a part of QoS Regulations.	We did not find any provision which mandates publishing of coverage maps as a part of QoS Regulations.	We did not find any provision which mandates publishing of coverage maps as a part of QoS Regulations.	We did not find any provision which mandates publishing of coverage maps as a part of QoS Regulations.	Service coverage map has been provided in certain countries. However, the direction of mandating the publication of such map by Telecom Service Provider has not been mentioned in any regulation.
2.	Accumulated downtime (Cells not available for service) Benchmark: ≤ 1% Method and Assessment Period: On average basis over a period of month.	Stringency has been increased from ≤2 % to ≤1%.	We did not find any Regulation which mandates reporting of Cell wise downtime data.	We did not find any Regulation which mandates reporting of Cell wise downtime data.	We did not find any Regulation which mandates reporting of Cell wise downtime data.	We did not find any Regulation which mandates reporting of Cell wise downtime data.	We did not find any Regulation which mandates reporting of Cell wise downtime data.

Draft Table on International Practices with regard to QoS benchmarks

Annexure – 4.

S No.	QoS Parameter	Position in India	Position in USA	Position in UK	Position in Canada	Position in Australia	Position in EU
3.	Reporting of significant network outage to the Authority within 24 hrs of start of the outage (Services not available in a district or State for more than 4 hours)	Report to be submitted within 24 hrs of the outage.	TSPs must submit outage report within 3 days to FCC.	Need to report within 24 hours to OFCOM.	Service providers to inform CRTC within two hours of major outages. Filing of comprehensive reports within two weeks of the outage.	Under laws introduced in the fallout of the 2022 Optus cyber-attack, Australian companies must report to the government within 72 hours if they believe they have experienced a cyber-attack.	Network Outage reporting not available.
4.	Call Set-up Success Rate	≥98%	-	-	-	-	EECC lays down the methodology for measuring the call set-up time. However, there is no benchmark laid down for call-set up success rate.
5.	Successful SMS Delivery	≥ 95% on the service provider's network within 20 seconds.	We did not find any provision which mandates successful delivery of	We did not find any provision which mandates successful delivery of SMS	We did not find any provision which mandates successful delivery of SMS	We did not find any provision which mandates successful delivery of SMS as a part of QoS Regulations.	We did not find any provision which mandates successful delivery of SMS

Draft Table on International Practices with regard to QoS benchmarks

Annexure – 4.

S No.	QoS Parameter	Position in India	Position in USA	Position in UK	Position in Canada	Position in Australia	Position in EU
			SMS as a part of QoS Regulations.	as a part of QoS Regulations.	as a part of QoS Regulations. No parameter to benchmarking the successful <u>of</u> SMS Delivery.		as a part of QoS Regulations.
6.	Resolution of billing/charging complaints.	For wireless, 100% of the complaints within 4 weeks.	-	-	-	Telcos are required to report the average time taken to resolve 80% of their complaints to ACMA.	EU under EECC, the formula for bill correctness complaint calculation method has been mentioned. However, EECC does not have a benchmark for the resolution of billing/charging complaints.
7.	Latency network	For network latency, the Point of Interconnection between packet switched networks	Not a part of QoS regulation. The measurement of the	Not a part of QoS regulation. OFCOM carries out study on the response time through an app	Not a part of QoS regulation. Canada does not have a benchmark for 4G/5G packet	Not a part of QoS regulation. The industry body of Telecommunication in Australia	EU has laid down the methodology with which network latency is to be calculated.

Draft Table on International Practices with regard to QoS benchmarks

Annexure – 4.

S No.	QoS Parameter	Position in India	Position in USA	Position in UK	Position in Canada	Position in Australia	Position in EU
		(4G/5G) should be <30 ms at LSA level.	parameter is carried out by the mobile app FCC Speed Test.	downloaded onto their smartphones.	switched network for Latency.	publishes standards.	EU does not lay down any specific benchmark for network parameters. Rather it compares the actual network latency occurring vs. what has been perceived by end-users.
8.	Jitter	<20ms	Not a part of QoS regulation. The performance of the parameter is carried out by the mobile app FCC Speed Test.	Not a part of QoS regulation. OFCOM carries out study on the response time through an app downloaded onto a set of selected consumers and the application is downloaded on their smartphones.	-	Not a part of QoS regulation. ACMA conducts studies to test the performance of modems and routers that are used to supply phone and internet services over the National Broadband Network. ACMA carries out these studies with third parties.	EU under EECC has laid down the formula with which Jitter can be calculated. EU does not lay down any specific benchmark for jitter in network parameters. Rather it compares the actual network jitter occurring

Draft Table on International Practices with regard to QoS benchmarks

Annexure – 4.

S No.	QoS Parameter	Position in India	Position in USA	Position in UK	Position in Canada	Position in Australia	Position in EU
							vs what has been perceived by end-users.
9.	QoS benchmark for Point of Interconnection Congestion performance between packet switched networks at LSA Level (Packet Loss)	For this parameter, benchmark of packet loss <1%.	-	-	We did not find any such criteria for 4G/5G packet switched network in Canada.	Not a part of QoS regulation. Communication Alliance has defined Packet Loss Ratio.	EU under EECC has laid down the formula for the calculation with which packet loss can be calculated. EU does not lay down the benchmark for jitter in network parameter. Rather it compares the actual packet loss occurring vs what has been perceived by the end-users.
10.	Response time to customer for assistance Accessibility of Call Centre.	≥95% within ninety seconds.	-	-	85% of the calls being responded by live MRS (Message Relay Service) operator	The Service provider should ensure that local customer service hotline should	EECC has not laid down a benchmark for the response time however

Draft Table on International Practices with regard to QoS benchmarks

Annexure – 4.

S No.	QoS Parameter	Position in India	Position in USA	Position in UK	Position in Canada	Position in Australia	Position in EU
					within 10 seconds.	operate during normal business hours.	the providers of internet access services should inform the customers about the customer assistance and other after sales services.
Quality of Service (QoS) Parameters for Access Service (Wireline)							
11.	Fault Repair Time	In urban areas: 85 % by next working day and 100% within 5 days. Fault repair of ≥75% by next working day in rural and hilly areas and 100% of faults to be resolved within seven days in rural and hilly areas.	-	85% of faults are expected to be repaired within 2 days and 97% of the reparations are to be completed within 7 days.	-.	i. Urban :(10,000+ people)-> Within 5 working days. ii. Major rural (2501 to 9999 people) -> Within 10 working days. iii. Minor rural (201 to 2500 people) -> Within 15 working days. iv. Remote (up to 200 people)-> Within 15 working days	EU under EECC has laid down the methodology for the calculation of Fault Repair Time. However, there were no benchmarking of the same.

Draft Table on International Practices with regard to QoS benchmarks

Annexure – 4.

S No.	QoS Parameter	Position in India	Position in USA	Position in UK	Position in Canada	Position in Australia	Position in EU
12.	Meant Time to Repair	≤ 10 hours	We did not find any provision which mandates MTTR as a part of QoS Regulations.	-	We did not find any provision which mandates MTTR as a part of QoS Regulations.	We did not find any provision which mandates MTTR as a part of QoS Regulations.	-
13.	Resolution of billing/charging complaints.	For wireline services, metering and billing which requires 100% resolution within 6 weeks in accordance to the new regulation on monthly basis	-	OFCOM uses independent Approval Bodies who are accredited to approve these Communication Providers and demonstrate compliance in this direction.	CRTC expects the service provider to resolve the issue within 20 calendar days.	Resolving of billing errors to be resolved within 40 days.	-
Quality of Service Parameters for Broadband Service (Wireline and Wireless)							
14.	Latency for broadband	Wireless <100 ms (in 4G and 5G) Wireline: <50 ms	FCC Mandates <100 ms.	Not a part of QoS Regulation. An application is used to run test continuously to avail data on Latency.	Not a part of QoS regulation. CRTC commissions third parties to carry out study on performance of broadband services.	-	-

Draft Table on International Practices with regard to QoS benchmarks

Annexure – 4.

S No.	QoS Parameter	Position in India	Position in USA	Position in UK	Position in Canada	Position in Australia	Position in EU
15.	Jitter For Broadband	Wireless: ≤50 ms Wireline: ≤40	FCC has no threshold on Jitter. It collects data via third party.	OFCOM does not have a QoS benchmark for Jitter. It provides for an application which tests the parameters.	Not a part of QoS Regulation. CRTC commissions third parties to carry out study on performance of broadband services.	-	Data Not Available.