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This submission is offered in a constructive and consultative spirit. It broadly supports the Authority's stated objectives — strengthening 5G network-slicing oversight, improving the accuracy and reliability of published coverage maps, and tightening the reporting/disincentive framework. Several drafting choices in the Consultation Paper (notably the consolidation of natural-justice provisions in the proposed Regulation 17A, and the move to independent, formula-based validation of coverage maps) represent genuine improvements over the 2024 Regulations and are supported without reservation.

STAKEHOLDER COMMENTS / SUGGESTIONS

On the Draft Amendments to

“The Standards of Quality of Service of Access (Wireline and Wireless) and Broadband (Wireline and Wireless) Service Regulations, 2024”

Submitted to:

The Telecom Regulatory Authority of India (TRAI)

Subject: Comments and suggestions on the Draft Amendments to the Standards of Quality of Service of Access (Wireline and Wireless) and Broadband (Wireline and Wireless) Service Regulations, 2024

A. PRELIMINARY SUBMISSION

We appreciate the Authority's continued efforts to strengthen the Quality of Service framework, particularly in view of technological developments such as 5G network slicing, the increasing importance of consumer-facing coverage information, enhanced outage reporting, improved QoS measurement and stronger compliance mechanisms.

The proposed amendments represent an important step towards greater transparency, accountability and consumer protection. The following comments are therefore submitted constructively and with the objective of improving clarity, technical robustness, implementability and regulatory certainty, while preserving the intended consumer-centric outcomes.

The Consultation Paper itself identifies the principal objectives as addressing emerging 5G capabilities, reviewing the coverage-map framework, strengthening QoS monitoring and correcting inconsistencies noticed during implementation.

Our comments are set out below in the prescribed format.

B. CONSOLIDATED COMMENTS

S. No.	Para / Provision	Input / Comment / Suggested Modification	Justification
1	Para 2 – Regulation 2(1)(sa): Definition of PRB	Retain the proposed definition, but consider adding a reference to the applicable 3GPP/TEC technical standard and clarify that the definition is for QoS measurement purposes.	The proposed definition is technically sound in principle. However, PRB-related measurements are technology- and implementation-sensitive. The Consultation Paper itself recognises that PRB utilisation is standardised by 3GPP and adopted by TEC. A standards-linked definition would reduce interpretational divergence and future-proof the provision.
2	Para 3 – Regulation 4(1)(ii): Fault incidences	Support the clarification that the parameter should expressly read “No. of faults per 100 subscribers/month”.	The explanatory note records that omission of “per month” created ambiguity and potentially altered the effective stringency of the benchmark. Incorporating the intended position directly into the regulation is appropriate and improves certainty.
3	Para 4(b) – Regulation 6(1)(xv): PRB utilisation >80%	Clarify the denominator, treatment of unavailable cells, maintenance windows, newly commissioned/decommissioned cells and force-majeure events.	The proposed benchmark is $\leq 1\%$, calculated on cell-days. However, the regulatory consequence depends

			materially on which cells constitute the denominator. A precise exclusion/inclusion methodology is necessary for reproducible and auditable results.
4	Para 4(d) – Regulation 6(3): 21-day advance submission before creation of a network slice	Consider permitting an exception for emergency/temporary network optimisation and require only material changes to be notified in advance.	A universal 21-day advance requirement may create operational difficulty where network slicing is deployed dynamically to address traffic, enterprise requirements or urgent capacity management. A defined emergency/temporary-change mechanism would preserve regulatory visibility without unnecessarily constraining network operations. The proposed provision currently requires submission at least 21 days before creation of a new slice.
5	Para 6 – Regulation 9(1)(iv): 90th percentile speed	Specify minimum sample size, sampling methodology, test locations, subscriber selection methodology and treatment of insufficient samples before declaring a tariff offering compliant/non-compliant.	A percentile-based parameter is statistically meaningful only when supported by an adequate and representative sample. Without a minimum sample threshold and consistent sampling methodology, results may be materially

			influenced by sample size or selection. The proposal further treats a tariff offering as non-compliant where one technology fails the relevant percentile criterion.
6	Para 6 / Schedule-I – 90th percentile measurement	Clarify whether the 90th percentile is to be calculated separately for download and upload and separately for each technology, and prescribe the precise percentile calculation convention.	The draft states that measurements are to be arranged in descending order, but an explicit statistical convention would prevent different interpretations in automated systems and audits. This is particularly important where compliance has financial or regulatory consequences.
7	Para 6(b) – Significant Network Outage	Support the proposed expansion but request clear rules for identifying the affected subscriber population, data cut-off time, overlapping outages, planned maintenance, force majeure and temporary degradation.	The proposed definition appropriately captures situations where a large subscriber base is affected even if an entire district is not unavailable. However, the 10% LSA threshold requires a reproducible denominator and time reference. The Authority's objective is fully supported, but operational definitions should be explicit.
8	Regulation 9 – Rebate for outage exceeding 24 hours	Clarify the methodology for calculating “actual number of days”, particularly where an outage crosses calendar days or	The proposal provides proportional rent rebate/validity extension and separately states that

		affects subscribers for different durations.	more than 12 hours in a calendar day shall be treated as one full day. A uniform subscriber-level calculation methodology would improve fairness and avoid inconsistent implementation.
9	Para 7 – Regulation 10: Billing/charging complaints	Support the one-week resolution benchmark, subject to clear definition of the starting point, customer dependencies and cases requiring third-party/system reconciliation.	A shorter resolution period is consumer-positive. However, cases involving disputed third-party transactions, payment gateways, roaming partners or customer-supplied documents may require additional time. The regulation should distinguish controllable service-provider delay from genuine dependency-driven delay.
10	Para 8 – Regulation 15: Quality of Experience Score (QoES)	Support the introduction of QoES, but request publication of the methodology, weightages, data sources, normalisation methodology and treatment of statistical outliers before the score is used for public comparison or regulatory consequences.	QoES combines network performance, consumer service and consumer perception. The existing framework already permits publication of compliance reports, customer surveys and audit findings. A composite score should be transparent, reproducible and capable of independent validation before being relied upon for comparative assessment.

11	Para 9 – Regulation 16A: False compliance reporting	Clarify the expression “absolute value of difference exceeds 1% of the prescribed benchmark” and prescribe the calculation methodology, rounding rules and materiality threshold.	A 1% tolerance may have very different practical implications depending on whether the underlying parameter is a percentage, time, speed or count. The provision should specify whether the tolerance is absolute percentage points, relative percentage deviation or another defined measure. The draft currently treats such a mismatch as false reporting when the difference exceeds 1% of the prescribed benchmark.
12	Para 10 – Regulation 16B: Financial disincentive for other non-compliance	Reconsider the breadth of the proposed catch-all provision and introduce a materiality/proportionality framework, rectification opportunity and distinction between substantive and procedural non-compliance.	Regulation 16B proposes a financial disincentive of up to ₹5 lakh per instance, increasing to ₹8 lakh and ₹10 lakh for repeated contraventions. A broad “any other provision” formulation may unintentionally cover minor, technical or inadvertent procedural deviations in the same manner as substantive non-compliance.
13	Regulation 16B – Overlap	Expressly provide that the same underlying event cannot attract more than one financial disincentive under Regulations 16, 16A, 16B, 17 or 18, unless	Although the draft contains exclusions, the breadth of the provisions warrants an explicit “no double jeopardy/double financial disincentive

		expressly intended and separately justified.	for the same contravention” safeguard. This would improve certainty and proportionality.
14	Para 11 – Regulation 17	Support restoration of a specific consequence for delayed/non-submission of compliance reports, but retain an explicit opportunity for representation before imposition of the financial disincentive.	The draft proposes up to ₹5,000 per report per day and up to ₹10 lakh where the report remains pending beyond three months. The provision should operate with adequate procedural safeguards, particularly where delay arises from system failure, force majeure or circumstances beyond reasonable control.
15	Regulation 17A	Support the common procedural safeguard and consider extending it expressly to include notice of the basis of proposed computation, reasonable time to respond and consideration of the response through a reasoned order.	Consolidating the opportunity of representation into Regulation 17A improves drafting efficiency. It would be further strengthened by making the procedural sequence explicit. The draft already recognises the right to a reasonable opportunity of representation.
16	Schedule-I, Para 3.2.2 – Complaint registration during outages	Support the proposal, with clarification that system-generated fault tickets should contain adequate traceability and should not automatically be treated as individual subscriber complaints unless the subscriber’s service impact is established.	The proposed requirement appropriately prevents loss of complaint visibility during network disruptions. However, a network-generated fault event and a subscriber-

			specific complaint are not necessarily identical data points and should remain analytically distinguishable.
17	Schedule-I, Para 4.1.1 – Coverage map validation	Support physical/virtual drive testing, but prescribe minimum calibration, independent validation and audit requirements for virtual drive-test tools.	The paper appropriately recognises virtual drive testing but requires independent certification, calibration and correlation with physical drive testing before use. This principle should be retained and made operationally explicit.
18	Schedule-III, Para 1.2 – 98% coverage-map accuracy	Support the 98% benchmark, but clarify the confidence level, minimum sample size, sampling distribution, treatment of clustered samples and statistical confidence interval.	A 98% accuracy requirement is meaningful only when the validation sample is statistically representative. Without minimum sampling criteria, a very large or very small sample can materially affect the result. The draft presently provides the 98% benchmark and validation framework.
19	Schedule-III, Para 1.5 – Grid resolution	Clarify the apparent terminology mismatch between “hexagon-shaped” grid coverage and the stated 50m × 50m / 100m × 100m resolution.	The draft describes a hexagonal grid while expressing resolution in square dimensions. A technically precise definition of the hexagon geometry, equivalent spatial resolution and cell area would prevent

			GIS implementation ambiguity.
20	Schedule-III, Para 1.7 – Signal-strength thresholds	Clarify whether thresholds are mandatory minimum classification criteria or may be supplemented by technology/service-specific performance indicators.	The draft correctly recognises that signal strength is necessary but not sufficient to guarantee service quality because backhaul, loading and other factors influence actual user experience. This distinction should be made operationally explicit in the classification methodology.
21	Schedule-III, Para 5.5.1 – +3 dBm margin	Request publication of the technical basis, uncertainty analysis and validation supporting the +3 dBm adjustment, and periodic review based on field evidence.	The proposed +3 dBm adjustment applies to TRAI App samples, while zero margin is proposed for TRAI independent drive tests. Since the adjustment directly affects whether a sample is classified as accurate/inaccurate, its technical basis should be transparent and periodically validated.
22	Schedule-III, Para 5.5.3 – Accuracy determination	Clarify whether an accuracy assessment should recognise uncertainty bands where the measured value falls close to a classification threshold.	A binary classification immediately above/below a threshold may overstate precision where measurement uncertainty exists. A defined tolerance/uncertainty treatment would improve technical

			fairness and audit defensibility.
23	Schedule-III, Para 6 – User feedback	Support the feedback mechanism, but require clear privacy safeguards, purpose limitation, consent/notice and retention rules for phone numbers, location data and screenshots.	The proposal may capture location, phone number and screenshots and share responses with TRAI through APIs. Such data handling should be governed by explicit privacy, security, access-control and retention provisions.
24	Schedule-III, Para 6.4 – Amber marking	Support the corrective transparency mechanism, but define the validation threshold, review period and removal process for amber-marked areas.	Highlighting areas where published coverage exceeds actual performance is consumer-friendly. However, objective criteria are required for initiation, periodic review and removal so that temporary discrepancies do not result in indefinite adverse classification.
25	Schedule-III, Para 7 – API submission	Support API-based submission, subject to publication of API specifications, version control, authentication, encryption, error handling, acknowledgement, data integrity and business-continuity mechanisms.	API-based reporting can materially improve regulatory monitoring. However, mandatory data exchange should have a stable technical specification and controlled change-management mechanism. The draft proposes REST API/JSON/GeoJSON submission and mandatory metadata.
26	Schedule-III, Para 7.6 –	Support a standardised national grid, but provide an official version-controlled grid, change-management protocol	A fixed reference grid can significantly improve comparability across operators.

	Standard reference grid	and backward compatibility mechanism.	However, any change to the grid can affect historical comparability; therefore, versioning and archival arrangements are essential.
27	Schedule-III – Coverage-map update within three months	Consider a shorter update requirement for material network changes while retaining three months as the maximum outer limit.	The draft already requires updating at the earliest after significant network changes and, in any event, not later than three months. A risk-based trigger for material changes would better align consumer information with actual network conditions.
28	Para 14 / Schedule amendment provision	Any future modification of technical schedules through directions/orders should preferably follow prior stakeholder notice where the modification materially affects compliance, cost, reporting methodology or consumer-facing obligations.	The proposed provision allows Schedule details to be modified through direction/order in view of technological advancement. While flexibility is necessary, material regulatory changes should have adequate transparency, notice and implementation time.
29	Implementation date – 1 October 2026	Consider a phased implementation/transition period for provisions requiring substantial system, API, network analytics, billing or customer communication changes.	The draft proposes commencement from 1 October 2026. Several provisions require system development, data integration, testing, validation and operational changes. A defined transition

			mechanism would reduce implementation risk without diluting the regulatory objective.
30	General – Measurement and auditability	Request publication of detailed measurement methodology before the effective date of any new parameter carrying compliance or financial consequences.	The Regulations already require service providers to maintain raw/primary and processed QoS data and permit the Authority to prescribe record-keeping and measurement procedures. Consistent publication of methodologies will improve reproducibility and audit readiness.

C. IMPORTANT TECHNICAL OBSERVATION — SILENCE CALL RATE

Schedule-I, Para 5.7

The proposed definition provides that a call having any continuous RTP gap of ≥ 4 seconds is a “Silence Call”. However, the proposed numerator counts each silence-call instance, and expressly states that multiple instances within the same call are each added to the numerator.

Suggested modification.

The Authority may consider measuring:

Silence Call Rate = Number of calls having at least one qualifying RTP silence instance / Total number of calls established $\times 100$

Alternatively, if the Authority intends to measure silence incidents rather than affected calls, the parameter may be renamed accordingly.

Justification

This distinction is important because a call can contain multiple qualifying RTP gaps. Counting multiple incidents in the numerator while dividing by calls established produces a metric that is not intuitively a “call rate” and may potentially exceed 100% in extreme circumstances. A clear distinction between affected calls and silence incidents would improve statistical integrity and comparability.

D. IMPORTANT REGULATORY OBSERVATION — REGULATION 16B

The proposed Regulation 16B is perhaps the provision requiring the greatest drafting precision.

The stated objective—ensuring that all regulatory provisions are enforceable—is understandable and supported. However, a provision imposing up to ₹5 lakh per instance, escalating to ₹8 lakh and ₹10 lakh for repeated contraventions, across “any other provisions” should ideally incorporate a materiality and proportionality framework.

Suggested safeguards

The final provision may expressly recognise:

1. materiality of the contravention;
2. nature and duration of non-compliance;
3. consumer impact;
4. whether the deviation was intentional, negligent or inadvertent;
5. whether there was prompt voluntary rectification;
6. whether the service provider had reasonable technical/operational cause;
7. whether the same event is already covered by another financial-disincentive provision; and
8. the service provider’s opportunity to make a representation.

This would strengthen rather than dilute enforcement, because clear and proportionate enforcement provisions are more readily implementable and defensible.

E. IMPORTANT DATA GOVERNANCE OBSERVATION — COVERAGE MAPS

The proposed Schedule III is a substantial enhancement to consumer transparency. It requires technology-wise coverage maps, standard GIS parameters, self-validation, Authority validation, consumer feedback, amber marking and API submission.

However, the final framework should ideally establish a single technical chain of custody:

Measurement → Processing → Classification → Map Generation → Publication → Consumer Feedback → Validation → Correction → Audit Trail

For this purpose, the final guidelines may prescribe:

- timestamp;
- measurement source;
- device/test configuration;
- technology;

- location accuracy;
- signal measurement;
- model/version;
- map version;
- date/time of publication;
- subsequent correction history; and
- audit-log retention.

This will materially strengthen the evidentiary value of the coverage map during regulatory verification or consumer disputes.

F. IMPORTANT CONSUMER-PROTECTION OBSERVATION

The proposal to allow consumers to challenge coverage information is strongly supported. However, where the mechanism captures location, phone number and screenshots, the final framework should adopt privacy-by-design principles and collect only information necessary for validation.

A clear distinction may also be maintained between:

“consumer feedback” → “regulatory evidence” → “validated QoS non-compliance”.

Consumer feedback should be an important input to investigation, but should not automatically be treated as conclusive evidence of regulatory non-compliance without the prescribed validation process.

G. GENERAL RECOMMENDATIONS FOR IMPLEMENTATION

Without prejudice to the specific comments above, the following cross-cutting safeguards are recommended:

1. Measurement certainty

Every new QoS parameter should have a clearly prescribed methodology, sampling methodology, minimum sample size and treatment of exceptional observations.

2. Technical reproducibility

The same input data should, as far as practicable, produce the same compliance result when independently recalculated.

3. Proportional enforcement

Financial disincentives should correspond to the nature, materiality, duration and consumer impact of non-compliance.

4. No duplication of consequences

The same underlying event should not inadvertently attract multiple financial disincentives under different provisions.

5. Procedural fairness

Before a financial disincentive is imposed, the service provider should receive the relevant evidence/basis of computation and a meaningful opportunity to respond. The draft already consolidates this principle in proposed Regulation 17A.

6. Technology neutrality

Where technically feasible, regulatory obligations should specify the intended QoS outcome rather than unnecessarily prescribing a particular implementation architecture.

7. Controlled regulatory change

Technical specifications that may evolve should have version control, adequate notice and reasonable implementation timelines.

8. Historical comparability

Any change in measurement methodology, grid, sampling or formula should preserve the ability to distinguish genuine performance change from methodology change.

H. CONCLUDING SUBMISSION

The proposed amendments are broadly aligned with the objective of strengthening consumer transparency, network accountability, technology-readiness and Quality of Service monitoring. The introduction of enhanced coverage-map standards, network-slicing oversight, outage reporting, QoES and strengthened compliance provisions is a significant regulatory development.

The suggestions above are therefore intended not to dilute the proposed regulatory framework, but to make it clearer, technically reproducible, proportionate, operationally implementable and legally robust.

It is respectfully recommend that TRAI may consider incorporating appropriate clarifications regarding:

- (i) statistical sampling and percentile methodology;
- (ii) PRB measurement and denominator treatment;
- (iii) the definition and calculation of Silence Call Rate;
- (iv) outage measurement and subscriber-level rebate methodology;
- (v) the materiality and proportionality framework under Regulation 16B;
- (vi) the precise tolerance methodology under Regulation 16A;
- (vii) privacy and data governance for consumer coverage feedback;
- (viii) technical governance of API and GIS submissions; and
- (ix) adequate transition arrangements for provisions requiring substantial system or operational changes.

We respectfully submit that these refinements would enhance regulatory certainty without compromising the Authority's consumer-centric objectives and would facilitate consistent implementation across service providers while strengthening the credibility and auditability of the QoS framework.

Submitted for kind consideration.

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