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भारत संचार निगम लिमिटेड
(भारत संरकार का उपक्रम)
Bharat Sanchar Nigam Limited
(A Govt. of India Enterprises)

No.: BSNLCO-RGLN/30/1/2025-REGLN dated 15-12-2025

To,

Advisor (NSL-I),
Telecom Regulatory Authority of India,
WTC, Nauroji Nagar, New Delhi 110029.

(Thru Email: adv-nsl1@trai.gov.in, ja2-nsl2@trai.gov.in)

Sub: Comments on the Consultation Paper titled 'Review of existing TRAI Regulations on Interconnection matters'-reg

In reference to the Consultation Paper titled 'Review of existing TRAI Regulations on Interconnection matters' dated 10-11-2025, please find the comments of BSNL as below,

Comments on TRAI's Consultation Paper

In reference to the TRAI's Consultation Paper on "Review of existing TRAI Regulations on Interconnection matters", following is submitted to the Authority before commenting on point wise issues raised in the said consultation paper.

As per BSNL, various charges of Interconnection i.e. Port Charges, Termination charges, carriage charges, transit charges, and level of Interconnection are interrelated. Selectively amending one of these without holistically considering the other aspects is likely to affect the level playing between TSPs and impact the revenue. In this regard, Consultation Paper issued by the Authority covering the various aspects of Interconnection is a welcome step.

Important considerations in this Consultation Paper which may need to be commented upon are:

1. Type of Access Service
2. Types of Service Provider

Typically there may be three distinct types of Access Service:

I. Country based (National Level) – which can be further categorized ~~into~~ as Satellite based service and Internet based service;
II. LSA based (LSA Level) – Mobile Services
III. SDCA based (SDCA level) – Pure wireline Services.

Each of these three types have their own importance, significance and customer preference. Bringing all these services at same level will affect BSNL adversely.

BSNL understands that un-equals cannot be treated as equals. And accordingly, BSNL has been writing to TRAI, through comments to consultation papers/ pre-consultation papers.
The Telecom sector in India is broadly covered by two types of organizations:

1. The Public Sector organizations i.e. BSNL and MTNL, and
2. The Private organizations i.e. Airtel, RJIL, VI, QTL, Zoom etc.

TSPs can further be categorized into three distinct types –

1. Those providing full/ all types of access service (Mobile/ FTTH/ Wireline) i.e. Airtel, RJIL, etc;
2. Those into providing mainly SMS service (with no access network) i.e. QTL, Satzilio, etc, and
3. Those providing internet telephony (with no access network) i.e. RingCentral, Zoom etc.

To ensure level playing between these different types of service providers, and foster competition amongst them, the role of TRAI is indispensable. However, from the perspective of TRAI - looking at all TSPs at the same level, is not at all justified.

BSNL maintains that there can be no level playing field amongst these different categories of TSPs – especially in terms of Organization Structure, CAPEX and OPEX invested by these different categories of TSPs for providing different types of telecom services. Further, unlike private TSPs, a PSU like BSNL has all the social/ political/ economic considerations. BSNL is a strategic unit of Government of India and this aspect also needs to be considered and weighted upon by TRAI. BSNL is not expected to survive on Government Support perennially.

BSNL is a state-owned enterprise that fulfills a public sector role in telecommunications, including providing services in underserved & far-flung areas and supporting national digital initiatives. The government views BSNL as strategically important for bridging the digital divide and ensuring affordable telecom access across the country. It aids the connectivity requirements for the armed forces in remote areas under various projects as well. BSNL has proved its importance in maintaining services during National calamities and serving in extremist areas. Also, BSNL has to follow various govt. regulations for procurement, including a transparent tendering system following CPP guidelines, especially pertaining to Make in India initiative & similar such requirements. The role of BSNL is a facilitator in Nation building rather than a competitor to other TSPs.

Comments on Issues of Consultation:

Q1. For PSTN to PSTN, PLMN to PSTN and PSTN to PLMN, should the interconnection level be specified at LSA level? If yes, should the existing POIs at the LDCA/SDCA level also be migrated to the LSA level? Kindly justify your response.

***Reply*:** BSNL understands that the Level of Interconnection may not have relation to type of technology being used for interconnection. Instead, it may only be defined by presence of subscriber exchange module/ last mile connectivity, traffic,

IUC, QoS, Carriage involved. Today most TSPs under wireline connectivity are providing FTTH connections – whose network architecture and provisioning is totally different from the copper based wireline still being provided by BSNL. All such Copper wireline still operates from SDC3A and below SDCA exchanges.

Interconnection should be at the level/ location from where the traffic is required to travel the least and also provide sufficient QoS, **resiliency and redundancy**. Ideally, it should be nearest to the point of subscriber exchange.

In view of the existing interconnection levels and extant licensing/ regulatory provisions, the default Interconnection for PLMN-PSTN and PLMN-PLMN, which has PLMN on one side, may be at the **LSA level**. However, consequent upon TRAI TIR 2020, the default Interconnection for **PSTN-PSTN** should remain at LDCC level. However, the TSPs should also be allowed to interconnect at higher/ lower levels – in consideration of traffic and QoS, if mutually agreed.

In this regard following is submitted please:

Though, in case, the Interconnection at LSA level is made default by the Authority then it can be done in a phased manner with LDCA level connectivity (already shifted from SDCA connectivity recently) **after 5 years**. Also, if LSA level connectivity is proposed then BSNL should get compensation in lieu of cost incurred on maintaining the infra at LDCA level in terms of fixed cost of number of LDCAs, a LSA would cater to. This can be ensured by making a provision for revenue protection for 5 years for BSNL in terms of total charges levied for interconnection at LDCAs in case a TSP proposes to shift their POI for those LDCAs to LSA level.

A phased migration plan with clear timelines after cost-benefit evaluation is recommended. It ensures uniformity in service quality, redundancy planning, and network monitoring.

BSNL installed huge infrastructure in all LDCAs (330 approx.) across India to provide Interconnection to private TSPs in accordance with extant Regulations, spending crores of rupees and now the same TSPs are demanding disconnection at level 2 Tax locations and connectivity at level-1 TAX. BSNL requests TRAI to protect these investments and recurring costs of BSNL which was incurred by BSNL to meet the extant Regulations/ License conditions.

Q2. For PSTN to PSTN, PLMN to PSTN, PSTN to PLMN and PLMN to PLMN, should interconnection be allowed at a level other than the LSA level, based on mutual agreement? Kindly justify your response.

Reply: At present, India's numbering plan, routing architecture, QoS standards, and signaling principles are aligned with LSA-based interconnection. A single uniform LSA-based interconnection architecture keeps enforcement transparent, verifiable, and less prone to disputes.

For reasons of regulatory consistency, competitive neutrality, network integrity, enforcement feasibility and financial transparency, TRAI should permit interconnection at levels other than LSA on the basis of mutual agreement only

between operators. Though the technology may support interconnection at fewer points (i.e. higher than LSA levels) but commercially, the same may not be viable for incumbent operators like BSNL.

In view of above, it is recommended to move towards interconnection at a higher level on the basis of mutual agreement between operators in phased manner as lot of legacy network issues remain for BSNL. BSNL would need a minimum of **5 years for migration** to higher levels above LSA level. Also, a system of compensation for all LDCAs/LSAs served through the connectivity at higher level be considered.

Q3. Based on your response to Question 1 and 2 above, what changes, if any, are required in the level of interconnection / point of traffic handover as provided in the following:

a) Telecommunication Interconnection Regulations (TIR), 2018, and
b) Guidelines annexed to the Telecommunication Interconnection (Reference Interconnection Offer) Regulations, 2002? Kindly justify your response.

Reply: Changes be incorporated as per comments above.

Q4. Is there a need to mandate multi-path resiliency and redundancy in the Point of Interconnection (POI) framework to mitigate link failure at the primary POI in the case of:

i. PSTN-PSTN interconnection,
ii. PLMN-PLMN interconnection, and
iii. PLMN-PSTN interconnection?

Reply: BSNL has already provisioned redundancy in its network wherever feasible by overflow of traffic through higher level in case of emergency/ link failure situations. However, it is not mandated in current Regulatory framework.

Accordingly, **yes, Multipath resiliency and redundancy may be allowed in the POI framework to mitigate failure at the primary POI between multiple paths at the same level.**

It will enhance **network reliability** and prevent service outages in case of POI failures. Multi-path resiliency would ensure continued emergency service and meet growing QoS expectations.

A multi-path resiliency would be required as the points of interconnection reduce.

i. **PSTN-PSTN:** The alternate POI is recommended to be kept at adjacent/ nearest LDCA in the same LSA**.**
ii. **PLMN-PLMN:** Since there are more than one MSC, the alternate POI may be provided at any other MSC in the same LSA recommended to be kept at LSA level
iii. **PLMN-PSTN:** Recommended to be kept at LDCA level for at least 5 years to be further taken to a level above i.e. at LSA level**.**

Further, there should be safeguard and provisions to use Primary POI only. The secondary POI should be used in exigencies only — which should not exceed a reasonable time. Further, it should be left for mutual agreement between the service providers. ln case if primary & secondary POIs are at different levels and primary POI gets out of order, the charges for primary POIs would never be waived off. On Routing traffic through alternate POI, the applicable carriage charges should apply. This will be incentive enough for the service providers to attend to the faults in Primary POIs.

Q5. Is there a need to incorporate security provisions in the interconnection framework to ensure network security? If yes, kindly provide details along with an appropriate architectural diagram. Kindly justify your response.

Yes, to safeguard networks against fraud, interception, and signaling attacks security provisions in the interconnection framework should be incorporated to ensure network security.

- Security measures include:
  - Encrypted signaling (SS7, SIGTRAN, IPSec)
  - CLI validation and anti-spoofing measures
  - Firewalls, intrusion detection systems at POIs, Authentication, Logging & Auditing, Reverse Path Filters (RPF), Security information and Code updates.
  - Monitoring and reporting mechanisms for unusual traffic patterns ∘ Topology hiding and Traffic Policing to be implemented.

Further, some pointer to identification of TSP whose traffic is passing needs to be there. And, encryption may be used in addition to the above security requirements in case of use of public internet for interconnection i.e. the international connectivity etc.

Network security is critical to prevent fraud, toll bypass, and unauthorized access. Standardized security practices across TSPs ensure a uniform, secure ecosystem.

Q6(a) Should IP-based interconnection be mandated for new interconnections in the regulatory framework? Kindly justify your response.

(b) Should TSPs be mandated to migrate existing TDM based E1 interconnection to IP-based interconnection within a specified period? If yes, suggest timelines. Kindly justify your response.

Reply: (a) **Mandating IP-based interconnection is not required at present. IP-based Interconnection is subject to the readiness and security of the TSPs network for IP connectivity.** Can leave the same to mutual agreement.

(b) Migration to IP-based POIs will require adequate, high capacity and suitable firewall architecture, which is essential for ensuring network security for such high traffic 24X 7 connectivity till such time, BSNL will continue with the existing TDM/E1 based POI framework.

In view of above, migration from existing TDM E1 interconnection to IP-based should be **encouraged only when the readiness is confirmed as it requires huge investments by the TSPs to make their network ready and secure for IP interconnectivity.**

Legacy TDM should coexist during transition (as and when it starts) to ensure **service continuity**.

Q7. Should the existing processes of 'provisioning and augmentation of ports at POIs' under Chapter IV of the TIR 2018 in respect of following need revision:

i. seeking of ports at POIs
ii. Request for initial provisioning of ports, and
iii. Request for augmentation of POIs? Kindly provide your response with justification.

Reply: These provisions can remain as it is. However, the logic of a provider becoming a seeker for his traffic may be removed.

Q8. Should the existing framework for Interconnection process and timelines, as provided in the existing TRAI regulations including, The Telecommunication Interconnection Regulations (TIR) 2018, The Telecommunication Interconnection (RIO) Regulations, 2002, and The Telecommunication Interconnection (Charges and Revenue Sharing) Regulation 2001 be revised or continued.
Kindly indicate challenges, if any, currently being faced in the implementation of the framework by the TSPs and their possible remedies.
Kindly provide your response with detailed justifications.

Reply: An Important consideration for Interconnection process and timelines is media readiness — especially in cases where media provisioning upto POI is delinked and to be provided by another party. If media is available, the existing processes and timelines may be sufficient; however, in cases of media unavailability, especially in remote/ hard areas — the processes and timelines needs reconsideration. As per practical field conditions, a timeline of 120 days appears more realistic. Building a network, arranging for infrastructure space, if required, Laying of OFC etc. are time-taking activities.

Q9. Whether there is a need to revise the existing process of disconnection of POIs as provided in the regulation 11 of the Telecommunication Interconnection Regulations (TIR) 2018? If yes, what specific changes should be done in the disconnection procedure?
Kindly justify your response.

Reply: Yes, TRAI may introduce **tiered timelines** (shorter for fraud/security, longer for complex disputes) and the kind of action to be taken if the other party does not make payment of IUC charges. Disconnection of interconnectivity is harsh as it affects subscribers of both parties. As the Interconnection has been mandated by TRAI, the issues related to the payment of interconnection dues by one party to

another may also be addressed. There are cases of private TSPs going into insolvency – leaving huge, unrecoverable outstanding.

Q10. Is there a need to introduce a process for the surrender or closure of POIs in the regulatory framework? If yes, what should be the criteria, procedure, charges, and timelines, including the minimum retention period for POIs before a surrender or closure request can be made? Kindly justify your response.

Reply: POIs have been provided and are being provided in accordance with provisions in the License/ Regulations. Further, through this CP we are also in process of defining alternate POI. As such this issue needs to be addressed holistically. Further, the process of surrender/ closure of POIs exists in TRAI's TIR 2020 wherein it is mentioned that the POIs can be closed as:

> *"provided also that the existing POI at the SDCC level, for calls between PSTN and PSTN or between PSTN and NLD network, can be closed if the services of either of the interconnected service providers are discontinued in that SDCA."*

In addition, the Criteria and procedures for the surrender or closure of POIs should provide a structured exit mechanism, minimizing disputes, and maintain operational stability. It should include:

- Minimum retention period (i.e. at least 24 months) before surrender, This s justified as substantial cost is incurred in provisioning & the part of that cost should get recovered before closure of POIs is entertained.
- Traffic reconciliation and final settlement of charges should be done before surrender request is entertained.
- Ensures orderly exit of POIs without disrupting traffic or billing
- Minimum 90 days of notice period of closure with advance payment shall be mandated.

And it must be ensured that TSP should not divert the traffic of a POI (also on alternate POI if provisioned in Regulation) through another route and thereafter ask for surrender under the guise of less/ no traffic on the POI.

Further, it is submitted that clarity needs to be there for surrender of POIs at a location. The procedure for the same should be time-bound & explicit.

Q 11. In order to safeguard the interest of TSPs arising due to financial obligations of interconnection, is there a requirement for furnishing bank guarantee by one TSP to the other TSP? If yes, please provide the process and methodology for determining the initial bank guarantee amount and any subsequent bank guarantee amount, if required.

Kindly justify your response.

Reply: The Type of TSP **(PSU)**, financial securitization and Government **D**irections are important aspects while deciding on safeguarding **the interest of TSPs/ Govt.**

PSU arising due to financial obligations of interconnection.

BSNL should continue to collect Bank Guarantee from the private Telecom Service Providers to secure its dues. It has been observed in the case of TSPs going to insolvency that Bank Guarantee collected by the circles from the TSP secured the pending dues from the TSP to some extent and the same was adjusted in the outstanding dues. As regards, collection of BG by private Telecom Service Providers from BSNL, the same is not recommended as BSNL is a state-owned PSU.

Q12. Should a procedure be established for addressing delays in the payment of interconnection-related charges? If yes, what should be the procedure to address such delays? Kindly provide your response with justification.

Reply: Yes, levying of interest for delayed payment is enough for addressing delays in the payment of interconnection-related charges. Interest rate of MCLR+2% on delayed payment is quite OK. Although because of the disputed claims, the interest is rarely levied. Also, it may be made part of the procedure to disconnect the POI after inordinate delay in payment.

Q13. Is there a need to revise the financial disincentive framework as provided in these regulations? If yes, what specific changes should be done? Kindly justify your response.

Reply: Financial Disincentive should be on a case-to case basis after ascertaining the reasons, giving a chance to both the parties/ TSPs to explain their part. A flat Financial Disincentive because of delay in providing POI may not be the right approach.

Q14. Is there a need to revise the existing SMS termination charge? If yes, what are the considerations necessitating such a revision? If not, kindly provide justification

Reply: There are two types of SMS Termination charges applicable in India, viz,

a. SMS **(Domestic)** Termination Charges – which continues as 2 paise ever since TRAI's - THE SHORT MESSAGE SERVICES (SMS) TERMINATION CHARGES REGULATIONS, 2013 dated 24-05-2013 and effective from 01-06-2013.
b. Incoming International SMS Termination Charges – which is still in forbearance.

1. There is need to revise Domestic SMS termination charges; it should be set to zero. As voice termination charges in case of mobile calls are set as zero, the same logic should apply to SMS termination charges also.

Historically, studies show that the actual cost of terminating an SMS — especially in a GSM/modern IP-based signaling environment — is extremely low, often less than 1 paisa per SMS. The overhead of carrying an SMS (in terms of network resources, signaling, routing) is negligible compared to e.g. voice traffic or

broadband data. As such, any termination charge set by regulation would far exceed the actual marginal cost.

SMS (particularly A2P — application to person — e.g. OTPs, transaction alerts, banking alerts, service notifications) plays a critical supporting role for many sectors: banking, e-commerce, financial services, logistics, etc.

Imposing even a small termination charge, if passed on to the users or businesses, can increase costs. For end users, this may make routine SMS notifications costlier; for businesses, it would raise their operating cost (or force them to pass cost to customers), undermining digital services adoption and affordability.

2. The rate for Incoming International SMS Termination Charges needs to be defined by TRAI — which is long overdue. It is also proposed that the rate for incoming international SMS charges should be linked with the rate of US dollar as on 1st April of the FY.

Q15. Is there a need to prescribe SMS carriage charges when an NLDO carries SMS between the LSAs? If yes, what principles and methodology should apply? If not, kindly provide justification.

Reply: TRAI needs to mandatorily consider introducing SMS carriage charge.

Under the current regulatory framework, no explicit SMS carriage charge exists for scenarios in which National Long-Distance Operators (NLDOs) carry SMS traffic across Licensed Service Areas (LSAs) on behalf of Access Providers or Telemarketers. With the increasing use of NLDO infrastructure for A2P (Application-to-Person) and enterprise messaging, a regulatory gap has emerged in defining fair compensation for the long-distance transport element of SMS delivery.

A significant portion of commercial and OTP-based SMS today traverses multiple LSAs. Enterprises and telemarketers increasingly rely on NLDOs for long-distance connectivity due to:

- consolidation of SMS aggregation,
- centralized delivery architecture, and
- Growing volumes of pan-India messaging.

Without a prescribed carriage charge, NLDOs carry the cost burden of long-distance transport without a regulated revenue mechanism.

NLDOs incur tangible costs for:

- inter-LSA signaling and routing bandwidth,
- security, scrubbing, and traceability requirements under TCCCPR,
- maintenance of SMSCs and interconnect links,
- Congestion management during high-traffic events (e.g., festivals, elections).

Without a regulated carriage charge, these costs are not equitably recovered,

making SMS transport financially unsustainable in the long term. A regulated carriage charge will ensure every operator contributes proportionately to national-level SMS transport.

When NLDOs are fairly compensated, they can invest in capacity augmentation, maintain redundancy and robust routing infrastructure, reduce congestion and improve SMS delivery latency.

Q16. Is there a need to revise the existing access charge to be paid by the service provider to the originating provider for IN services? If yes, kindly provide detailed explanation; if not, kindly provide justification.

Reply: Yes, there is need to revise access charges. Nowadays, there are plenty of ways. Toll free number can be used by many companies & organizations in the 5G era. The rate is outdated (2007 2G-era cost) and should be treated at par to normal calls, where in there is zero access/IUC charges, as technically there is no difference in both call flows (normal or toll free), so why there should be any difference in IUC , whether calling user pays to TSP or called user pays to TSP . It may be done progressively by reducing it to Rs 0.10 i.e. 10 paisa initially. This will also make toll-free services much more affordable with reduced tariffs. Many companies are moving customer interaction to apps, web-selfcare, chatbots & VoIP based helplines, which can be cheaper per interaction than traditional toll-free calls.

Q17. Are there any difficulties that service providers encounter in complying with existing IN Regulations, 2006 in Multi-Operator and Multi-Network Scenario? Kindly describe these challenges in detail and suggest possible regulatory remedial measures to overcome these challenges.

Reply: Charges for other IN services also needs to be defined, at least the ceiling limits need to be specified.

Q18. Is there a need to revise the Telecom Regulatory Authority of India (Transit Charges for Bharat Sanchar Nigam Limited's CellOne Terminating Traffic) Regulation, 2005? Kindly provide your response with justification.

Reply: No Comments. The issue is no longer relevant in view of changed circumstances.

Q19. The existing interconnection regulatory framework provides for application of origination, carriage, transit, transit carriage and termination charges for various levels of interconnections for PSTN-PSTN, PLMN-PLMN, PLMN-PSTN. Based on the interconnection regulatory framework suggested in your response in Questions 1, 2 and 3 above, should there be a review of these charges? Kindly justify your response.

Reply: Carriage charges need to be increased based on distance of terminating end. Reference point for carriage charges needs to be terminating subscriber exchange. Fixed termination charges for pure wireline subscribers should be levied at a rate to justify the cost of termination.

Q20. For termination of emergency calls/SMSs from one TSP's network to another TSP's network, should there be a provision of any additional charges other than applicable IUC? If so, what should be the charges and the basis thereof?

Reply: The License granted by DoT allows BSNL and other TSPs to have separate commercial arrangement for provision of emergency and public utility services. Prior to 2010-11, BSNL has been charging other TSPs for termination of emergency calls from their network into BSNL @ Rs 1.20 per minute.

Vide letter dated 15-06-2010, DoT directed BSNL as:

> *BSNL is directed to accept Level-I emergency service calls from the private operators on non-discriminatory basis based on mutually agreed arrangements as per terms and conditions of the License Agreements. BSNL further directed to continue the same treatment with all the operators specifically when only 2-3 new operators are remaining. If BSNL wants to revise the agreement conditions, the same can be done with all existing and new operators.*

A per call basis system may not give a clear direction as lot of resources are required for maintaining a system for routing of emergency calls received from other TSPs. As fixed costs keeps on increasing with normal inflation, hence existing cost structure should continue.

Q21. Should the International Termination Charges (ITC) for international incoming calls to India be revised? If yes, what are the considerations necessitating such a revision.

Kindly provide your response with justification.

***Reply*:** Yes, the charges need to be revised in line with higher termination charges levied by foreign operators. This would lead to symmetry in the call volumes for ILD calls both way. The correct reference could be the average of termination charges levied by foreign TSPs. Further, it is also proposed that the rate for incoming international call charges should be linked with the rate of US dollar as on 1st April of the FY**.**

Q22. Is there a need to address the issue of telemarketing and robo-calls within the interconnection framework? If yes, kindly provide your inputs on the possible approaches.

Kindly justify your response.

***Reply*:** No, since a TCCCPR regime is already in place, the same would serve the purpose.

Q23. Is there a need to revise 'The Telecommunication Interconnection (Reference Interconnect Offer) Regulation, 2002'? If yes, kindly provide the specific revisions.

Kindly provide your response with justification.

***Reply*:** It is understood that RIO was published & followed by very few operators. One of the reasons for the same appears to be lack of clear-cut guidelines for determining a SMP & also the fact that probably it was left open to the operators to consider themselves as SMP, if they choose to. From which document, reference is to be taken for determination of SMP is unclear. Hence the revision of RIO at this stage may not carry any meaning unless the eligibility of Service providers is clearly spelt out.

Q24. For the purpose of interconnection, is there a need to revise the current categories of 'Services' and 'Activities' to determine Significant Market Power (SMP)?

Kindly provide your response with justification.

***Reply*:** Comments on Q23 be seen. Reference document from which to determine SMP needs to be made clear & also what happens when a particular service provider does not remain a SMP! Whether the criteria changes for any new service provider approaching the erstwhile SMP in such case, needs to be made clear by the Authority.

TRAI should revisit SMP definitions, as market structures have evolved substantially since 2002. Modern interconnection relies on IP-based platforms, shared data infrastructure, and digital services, which are not fully reflected in existing categories. SMP assessment should consider Category of PSU, interconnection traffic dominance, control over essential facilities, and dependency of smaller operators on larger networks. A simplified and updated SMP framework will ensure regulatory proportionality and fairness.

Q25. Should the publication of Reference Interconnect Offers (RIOs) on the websites of Telecom Service Providers (TSPs) be mandated?

Kindly justify your response.

***Reply*:** Same as above.

Q26. Should there be any infrastructure charges? If yes, kindly provide details about the following:

a. the types of infrastructure charges to be levied,

b. the guiding principles for determining such charges along with ceiling, if required, and

c. determination of time-based escalation methodology, if required.

Kindly provide your response with justification.

Reply: Infrastructure charges need to be regulated based on space charges & current/ power consumption. Also, if OFC is laid, laying of duct/ROW charges (recurring)/ One Time Charges (OTC) need to be part of infrastructure charges. Various heads under infrastructure charges can be enumerated in the regulations. Based on Category of cities, area of the city, rental value can be indicated in addition to OFC charges.

Q27. Whether following sections of The Telecommunication Interconnection (Charges and Revenue Sharing) Regulations, 2001:

a. Section IV which contains 'Revenue Sharing Arrangements' i.e. interconnection usage charges.

b. Schedule I and II which contains rates of interconnection usage charges. still hold relevance, in view of the subsequent issuance of the Regulation 4 under Section IV which specifies rates of 'Interconnection Usage Charges (IUC) under 'The Telecommunication Interconnection Usage Charges Regulations, 2003'.

Additionally, is there an alternative way to organize these two regulations to enhance clarity and ease of understanding?

Kindly provide your response with justification.

***Reply*:** These sections have limited relevance today because the 2003 IUC Regulation supersedes many of these provisions. However, it would be appropriate to merge the schedules of the two regulations into a one comprehensive regulation covering the current schedules.

Q28. Is there a need for change, if any, required in respect of following:

- **i. Port Technology**
- **ii. Port Size (Capacity)**
- **iii. Port Charges**
- **iv. Any other related aspect**

Kindly provide a detailed response with justification.

***Reply*:** As on date TRAI has defined Port charges only for E1/ TDM interconnectivity. There is no port charges defined for IP interconnectivity. While E1/ TDM port charges capacity may be defined in terms of number of E1's, the capacity of IP port needs to be defined in terms of bandwidth-based metrics.

Port technology definitions must reflect IP-based ports. Port sizes should shift from E1/TDM bundles to bandwidth-based metrics (e.g., Mbps or Gbps, 100 MB, 1G, 10G, 100G, 1Tb). Port charges should reflect modern cost structures, including shared infrastructure. TRAI may introduce a technology-neutral framework, allowing proportional charging based on capacity and usage.

With respect to Port Charges it is submitted that, earlier, TRAIs regulations with

respect to Port Charges are under challenge at various Courts of law. However, Port charges can be specified for different capacities as specified above based on the slab-wise systems for different port capacities. Also, the TSPs who have no access network, should not be allowed to get port charges based on incoming traffic to their subscribers.

Q29. Should port charges be uniform across all services and technologies? Kindly provide detailed response for the following categories specifically:

a. Fixed Line Service/ Mobile Service/ NLD service/ ILD service, and

b. E1 (TDM) based interconnection and IP based interconnection. In case non-uniform charges are suggested, what methodology should be followed for calculation of port charges for above mentioned categories of services and technologies.

Kindly provide a detailed response with justification.

***Reply*:** Uniform charges may not be feasible across all services due to distinct technical characteristics, **network architecture, cost structure, resource consumption, and traffic handling capabilities** across services and interconnection technologies.

For example,

- **Fixed Line vs Mobile:** Mobile ports involve higher signaling/QoS needs → higher cost than fixed line.
- **NLD vs ILD:** ILD ports require added compliance/security → higher charges than NLD transit.
- **E1 (TDM) vs IP:** TDM ports are hardware-intensive; IP ports scale by bandwidth/capacity → cost structures differ.

A rational methodology could include:

- Respective network of the service provider.
- Capacity-based pricing for IP (e.g. bps/Gbps)
- Per-port pricing for legacy TDM
- Service-neutral principles applied uniformly

Summary: Port charges may be **non-uniform**, reflecting actual cost drivers of each service/technology, ensuring fairness, transparency, and efficient interconnection.

Q30. Whether use of 'Erlang' as a unit of traffic in various interconnection regulations is sufficient and are the current procedures for demand estimation as provided in the Telecommunication Interconnection (Port Charges) Regulation 2001 and the TIR 2018 still effective and practical, in view of adoption of IP based interconnection?

a. If yes, kindly provide justification in support of your response.

b. If no, kindly provide alternate metrics and demand estimation methods for IP-based interconnection along with detailed explanation.

Reply: Erlang remains useful for basic voice load modeling, but it is insufficient for IP-based multimedia interconnection. For IP PoIs, traffic should be estimated in bandwidth terms (Mbps/Gbps).

TRAI may adopt a dual-model approach: Erlang for legacy systems and bandwidth-based modeling for IP.

Q31. Should the current provisions for submission, inspection and getting copies of interconnection agreements under 'The Register of Interconnect Agreements Regulations, 1999' using floppy disks and print copies be dispensed with and be made online?
a. If yes, what changes do you suggest for the online process, timelines, related charges and any other aspect?
b. If not, kindly provide justification.

***Reply*:** Yes, the current process using physical media is outdated. Submission and inspection of interconnect agreements should be moved fully online. A digital-first framework will significantly enhance transparency, efficiency, and compliance for both service providers and the Authority. It will reduce manual handling, sending by post and physical storage. However, as the documents are sensitive in nature, watermarking can be thought of.

Q32. Is there a need to incorporate provisions for financial disincentives in interconnection regulations to deter non-compliance? If yes, kindly provide specific scenarios and mention the concerned regulations, where financial disincentives would be applicable, along with their quantification.

***Reply*:** Financial Disincentive should be imposed in case of extreme cases only after giving suitable opportunities to service providers for hearing & it gets conclusively proved that the service provider needs reprimand financially. It should not be a routine.

Q33. What should be the mechanism and timelines for transition of existing interconnection agreements between the service providers to the new regulatory framework that will emerge from this consultation process?
Kindly provide detailed response with justification.

***Reply*:** A structured, phased transition, minimizing disruption is essential to operationalize the new interconnection regulatory framework smoothly. The mechanism ensures regulatory certainty, fairness, and minimal disruption to services.

At present many operators rely on legacy interconnection arrangements; sudden regulatory shifts could destabilize their operations.

Interconnection often requires technical reconfiguration; timelines must reflect real- world implementation challenges. Technical upgrades require planning,

procurement cycles, vendor dependencies, and testing. A **transition period of 5 years** ensures stable implementation without service disruptions and move their PoIs, capacity, and Interconnect Agreements to the new regime during which legacy Interconnect Agreements can continue.

Q34. What should be the interconnection framework for satellite-based telecommunications networks with other telecom networks? Further, whether the interconnection frameworks for MSS and FSS satellite-based telecommunications networks should be distinct? Please provide your response along with end-to-end diagrammatic representation and justification in respect of the following:
a. Satellite - Satellite network interconnection
b. Satellite - PLMN interconnection
c. Satellite - PSTN interconnection

***Reply*:** Comments with regard to Satellite based network initially may be referred. Satellite based telecommunication may be defined at national level. Accordingly,

a. Satellite - Satellite network interconnection may be defined at national level

b. Satellite - PLMN interconnection may be defined at LSA level

c. Satellite - PSTN interconnection may be defined at LDCA level

Q35. Are there any specific regulatory models from other countries that have successfully addressed interconnection related issues and challenges which can be adapted in the Indian telecom sector? If yes, kindly provide details of such international best practices.

Reply: In India, CPP model (Calling Party pays) is in force. India is a country where two types of Telecom Service Providers exist. One is Govt. PSU and other are Private TSPs. PSU like BSNL is bulky in structure having huge man power and large legacy infrastructure demanding huge operational and maintenance cost, whereas Private TSPs are leaner and focus more on providing service for maximum profits with least expense on infrastructure.

The inherent difference lies in the approach where PSU provide its services even for non-profitable Government missions whereas private TSPs are more profit centric.

In some countries the state TSP plays the primary role of Infrastructure provider to all private TSPs and the telecom service is primarily provided by Private TSP. A notable example of this approach is the **National Broadband Network (NBN) plan in Australia**, where a government-owned entity is responsible for the nationwide broadband infrastructure, which is then used by various private retail service providers. In Thailand, the state-owned National Telecom (NT) is positioning itself as an infrastructure-sharing provider to private operators.

In view of above, it is submitted that the same approach can also be implemented in India too with PSU like BSNL having large Infrastructure may be similarly designated as Infrastructure provider and private TSPs mandatorily utilize BSNL infrastructure on payment basis for their services. In addition as PSU TSP, BSNL should focus primarily on providing telecom service to Govt. organizations, other PSUs and to meet government obligations.

Q36. Kindly mention any other challenges or concerns related to the regulations being reviewed in this consultation paper.

***Reply*:** Security challenges must be addressed in case regulation for IP-interconnectivity is mandated. Given that many existing frameworks were built for simpler circuit-based networks, migrating rapidly to IP/satellite without robust security, monitoring, and disaster-recovery protocols could compromise **network reliability and user experience**. Huge investment are required to counter these security challenges & hence a graded migration is desirable.

Old Legacy equipment is used for the present Interconnection, it is still not End of Life and vendor support, hence replacing the same may not be commercially viable. Migration from legacy circuit switches to IP involves many challenges. There could be transition glitches, interoperability issues, backward compatibility problems (especially in remote/rural areas), increased latency, loss of quality of service, mismatches in protocols or traffic measurement, delays in POI provisioning, etc. If regulators and operators don't manage this transition carefully, end-users may suffer.

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