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To,

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Sub: Comments on Consultation paper on the review of tariff for Domestic Leased Circuits

Please find the Comments on Consultation paper on the review of tariff for Domestic Leased Circuits as below,

1. What is expected to be the likely impact on competition and tariffs in the DLC sector, if the ISPs are permitted to provide DLCs in the future? Please provide your response with justification.

Reply: TSPs like BSNL have made significant long-term investments in PAN-India Fiber infrastructure, last-mile connectivity, redundancy, and hardware infrastructure, while complying with stringent licensing, security, and quality-of-service obligations. Allowing ISPs, who operate under comparatively lighter obligations and rollout requirements, to enter the DLC market would not only encourage selective participation in high-revenue urban markets but it would also hamper the ability of infrastructure-intensive operators to recover costs. Moreover, customers who require PAN India links may face difficulties due to non-availability of ISPs services/infrastructure at all locations. Permitting ISPs to provide Domestic Leased Circuits (DLCs) is likely to distort competition and lead to unsustainable tariff outcomes in the DLC sector.

Globally, no major regulator permits infrastructure-light ISPs to provide leased circuits. Singapore's IMDA explicitly requires a Facilities-Based Operator (FBO) license for providing leased circuit services; Services-Based Operators (equivalent to ISPs) cannot provide primary leased circuits. In Australia, only licensed 'Carriers' who own network units can provide end-to-end leased circuits. In the USA, Competitive Local Exchange Carriers (CLECs) must obtain state-level certification and comply with 99.999% reliability standards, far exceeding ISP requirements. India's own TDSAT ruled in 2005 that ISP licenses do not authorize the provision of leased circuits, and DoT confirmed that ISPs were 'poaching on the territory of access providers.'

The well-documented phenomenon of ‘cream-skimming’ is directly relevant here. Ofcom’s UK market analysis shows that alternative networks concentrate in urban areas—Central London has multiple rival networks, but approximately 46% of the UK (Area 3) has no material commercial deployment by rival networks. This pattern compelled the UK Government to invest £5 billion through Project Gigabit for underserved areas. In India, dense routes like Delhi–Mumbai already see 60–80% discounts off ceiling tariffs from 7–10 providers, while remote areas have only 2–3 providers with tariffs near ceiling levels. Permitting ISPs without infrastructure obligations would intensify urban competition while doing nothing for underserved areas, destroying BSNL’s ability to cross-subsidize rural service from urban revenues.

The proposed expansion of ISP authorization to include DLCs, would ‘unfairly disadvantage existing Access and NLD operators.’ This industry-wide opposition underscores the damage such a move would cause to infrastructure-investing operators.

2. What is the likely impact of tariffs for DLC on the bandwidth charges (including the transmission costs) or any other costs incurred by ISP operators, especially for ISP B & C operators who do not have their own transmission infrastructure? Further, what are the specific elements of DLC tariff which can be addressed in the regulation to make it more relevant for ISP B & C business? Please provide your response with justification.

Reply: DLC tariffs represent the real cost of creating and maintaining nationwide telecom infrastructure, including fiber networks, last-mile connectivity, redundancy, operations, and security compliance. These networks require heavy and continuous investment over many years.

Higher bandwidth and transmission costs faced by ISP-B and ISP-C operators mainly result from their business model, where they choose not to invest in their own transmission infrastructure and instead rely on leased bandwidth. This is a commercial choice and should not be addressed through regulatory intervention. Any reduction or regulation of DLC tariffs to support such ISPs would unfairly burden infrastructure-investing TSPs and distort competition.

No major regulatory jurisdiction has intervened to reduce DLC tariffs specifically to support infrastructure-light operators. The EU’s SMP framework, the FCC’s Business Data Services Order (2017), and Ofcom’s Telecoms Access Review all condition regulatory intervention on market failure evidence—not on the business model choices of individual operators. ISP-B and ISP-C operators who choose not to invest in infrastructure benefit from lower capital requirements and lighter regulatory obligations. It would be fundamentally inequitable to mandate tariff reductions that effectively subsidize these operators at the expense of TSPs like BSNL, who bear universal service obligations, security compliance costs, and nationwide rollout requirements. The FCC explicitly rejected this approach in its 2017

BDS Order, finding that ‘ex ante pricing regulation is of limited use—and often harmful—in a dynamic and increasingly competitive marketplace.’

3. Should the MPLS-VPN DLCs be brought under the tariff regulation framework? Please provide your response with justification.

Reply: MPLS-VPN-based DLCs should not be brought under the tariff regulation framework, as they are fundamentally different from traditional point-to-point leased circuits. MPLS-VPN is a managed, intelligent network service that requires specialized core infrastructure, including MPLS routers, traffic engineering, QoS mechanisms, redundancy, and continuous network management. It supports features such as class-of-service, dynamic routing, scalability, and multi-site connectivity, which are not present in simple point-to-point DLCs.

Regulating MPLS-VPN tariffs in the same manner as point-to-point circuits would ignore these technical complexities and higher investment costs. MPLS-VPN services are typically customized to enterprise requirements and are best offered under commercially negotiated pricing. Imposing tariff regulation would reduce flexibility, discourage innovation, and negatively impact investment in advanced enterprise network infrastructure.

No major regulator globally imposes tariff regulation on MPLS-VPN services. In the UK, Ofcom regulates wholesale leased line access (Ethernet up to 1 Gbit/s, dark fibre, physical infrastructure) but does not regulate MPLS-VPN. In the EU, the SMP framework targets wholesale trunk and terminating segments of leased lines—not value-added services built on them. In the USA, MPLS-VPN has not been classified as a telecommunications service by the FCC and is not subject to tariff filing requirements or price caps. In Australia, the ACCC declares only the underlying Domestic Transmission Capacity Service—MPLS-VPN is not a declared service. In Japan, even wholesale leased line pricing is unregulated, let alone managed services. In Singapore, IMDA distinguishes basic local leased circuits (potentially regulated for dominant operators) from IP VPN services (commercially negotiated).

The logic is straightforward: MPLS-VPN involves significant value addition beyond basic point-to-point transmission—QoS management, traffic engineering, label switching, SLA management, network monitoring, and security. SD-WAN or SASE—an emerging substitute—is entirely unregulated in every jurisdiction globally. Tele Geography data shows MPLS VPN port prices declining 10-20% annually through competitive pressure alone, without any regulatory intervention. Bringing MPLS-VPN under tariff regulation would place India out of step with every major market and stifle innovation in a competitive, technology-driven segment.

4. What are the key differences in cost structure and service delivery between traditional P2P-DLCs and MPLS-VPNs that should be reflected in tariff regulation? Please provide your response with justification

Reply: P2P-DLCs are relatively simple connectivity services, involving dedicated access links with limited core intelligence and minimal ongoing network management. Their costs are largely driven by access fiber, distance and bandwidth provisioning.

In contrast, MPLS-VPNs require substantial additional investment in specialised MPLS core infrastructure, including high-capacity routers, traffic engineering, QoS mechanisms, redundancy, and continuous network monitoring. Service delivery is more complex, as MPLS-VPNs support multi-site connectivity, class-of-service, scalability, and dynamic routing, often customised for enterprise needs.

Applying similar tariff regulation to both would ignore these higher costs and operational complexities, reduce pricing flexibility, and undermine incentives for large TSPs to invest in advanced enterprise network capabilities.

BEREC's 2022 Regulatory Accounting report confirms that across EU National Regulatory Authorities, wholesale access services including leased lines 'must bear a fair share of common and joint costs.' The ITU's 2021 Guidelines on Cost Modelling explicitly state that pure LRIC for services accounting for a considerable proportion of traffic (e.g., leased lines, broadband access) 'would be inappropriate as it could lead to cost recovery difficulties.' The distinction between P2P-DLC and MPLS-VPN cost structures is recognised in every major market—Ofcom's charge controls apply only to wholesale Ethernet access and dark fibre, not to managed network services. Any tariff regulation that treats these fundamentally different services identically would violate established international regulatory practice.

5. What has been the impact of deployment of DWDM, SD-WAN and Ethernet over Fibre on provisioning of DLCs, in terms of operations, costs and tariffs? Should the regulation incorporate these technological changes in the ceiling tariff framework? Please provide your response with justification.

Reply: The deployment of advanced technologies such as DWDM, SD-WAN or SASE, and Ethernet over Fibre has improved the operational efficiency and scalability of Domestic Leased Circuit (DLC) provisioning. However, these technologies do not eliminate the fundamental cost drivers of DLCs, such as fiber rollout, right-of-way charges, last-mile construction, redundancy, power, skilled manpower, and continuous network operations.

So tariff regulation should remain technology-neutral and market-driven, allowing large TSPs like BSNL to have the flexibility to price services based on investment intensity, service complexity, and customer requirements, rather than mandating reductions solely due to technology evolution.

The EU's European Electronic Communications Code (EECC, 2018) enshrines technology neutrality as a core principle: regulators 'should neither impose nor discriminate in favour of the use of a particular type of

technology.’ Technology-specific tariffs create five documented market distortions: (i) they artificially sustain obsolete technologies by price-regulating legacy TDM/SDH at below-cost levels; (ii) they penalise innovation by subjecting new technologies to legacy frameworks; (iii) they create arbitrage opportunities between differently-tariffed but functionally equivalent services; (iv) they discourage investment by capping returns on new technology deployments; and (v) they cannot keep pace with technology evolution—tariff review cycles of 3–5 years lag far behind technology change.

Ofcom’s approach demonstrates best practice: regulation targets wholesale inputs defined by function rather than technology. Dark fibre access—a passive, technology-neutral input—is increasingly the preferred regulatory remedy. TRAI’s tariff framework should remain technology-neutral and market-driven, preserving flexibility for operators to deploy the most efficient solutions.

6. Are there any other technological changes apart from the ones mentioned in above paragraphs in provisioning of DLCs in India? If yes, what has been the impact of deployment of such technologies on provisioning of DLCs, in terms of operations, costs and tariffs? Should the regulation incorporate these technological changes in the ceiling tariff framework? Please provide your response with justification.

Reply: Apart from the technologies mentioned in Q5, Software-Defined Networking (SDN), Network Function Virtualisation (NFV), and AI-driven network automation are increasingly deployed in DLC provisioning globally. These technologies reduce operational costs but require substantial upfront R&D and integration investment. The regulatory framework should not mandate tariff reductions based on assumed cost savings from technology evolution, as this would penalise early adopters and discourage innovation investment. The global standard is to allow technology benefits to flow through market competition rather than regulatory fiat.

7. As an alternative to Q5 & Q6, should the Authority consider technology-neutral tariff models, focusing on bandwidth and service commitments rather than provisioning technologies? If yes, what should be the criteria for the same? Please provide your response with justification.

Reply: Authority may consider technology-neutral tariff models only for P2P DLCs and such models should focus on service delivery and service assurance rather than underlying provisioning technologies, while fully recognising the cost and investment realities of large TSP networks. Technology-neutrality would allow operators to deploy the most efficient solutions for P2P Circuits without regulatory constraints tied to specific technologies. However, such tariff models must be designed carefully. The key criteria should include: Bandwidth capacity and scalability, Service-level commitments, Network security obligations, Geographical scope and last-

mile complexity etc.

For managed network services like MPLS VPN type of DLCs, technology neutral tariff model is not suitable as it has certain specific requirements of traffic engineering, QoS mechanisms, dynamic routing, scalability, and multi-site connectivity. So, it has totally different requirements from traditional P2P service delivery and choice of technology plays a key role here as different solutions are being tailored for different Enterprise customer segments.

Technology-neutral tariff models are the established international norm. The EECC (EU), FCC's BDS framework (USA), and Ofcom's WFTMR (UK) all define regulated services by function and bandwidth rather than by legacy technology nomenclature. However, this approach works for P2P circuits precisely because they are standardised, relatively simple services. MPLS-VPN and other managed network services require technology-specific customisation—traffic engineering mechanisms, QoS class definitions, and routing protocols are inherently technology-dependent. Applying a uniform technology-neutral tariff to managed VPN services would be akin to regulating the price of a customised software solution as if it were a commodity—an approach rejected by every major regulator.

8. What are the various service commitments (such as bandwidth, SLA requirements such as uptime, latency, packet loss, response time etc.) bundled as part of managed DLC service, for both P2P & VPN based DLC? How are the service commitments offered as part of managed DLC services linked with the tariffs? Please provide your response with justification.

Reply: Managed Domestic Leased Circuit (DLC) services offered by large TSPs like BSNL bundle multiple service commitments that go well beyond basic bandwidth provisioning, for both point-to-point (P2P) and VPN-based DLCs.

For P2P-based DLCs, service commitments typically include committed bandwidth, high uptime (often 98%–99%), defined latency and packet-loss thresholds, round-the-clock monitoring, fault response and restoration timelines, and end-to-end service assurance. These services rely on dedicated paths and require strong last-mile and transmission redundancy. For VPN-based DLCs, commitments are more complex and include class-of-service-based bandwidth guarantees, latency and jitter parameters per traffic class, packet-loss thresholds, multi-site scalability, traffic prioritisation, and proactive network management across the core.

Tariffs for managed DLC services are directly linked to these commitments. Higher bandwidth guarantees, tighter SLA parameters, faster restoration times, enhanced redundancy, and customised service features significantly increase network design, operational effort, and investment costs. Accordingly, tariffs reflect the level of service assurance and complexity, not merely raw capacity. Regulating tariffs without accounting for these

differentiated service commitments would undermine the ability of large TSPs to deliver reliable managed connectivity,

The global enterprise leased line market—valued at approximately USD 31.6 billion in 2024 and growing at 3-5% CAGR—is characterised by commercially negotiated pricing for managed services. TeleGeography data shows that the median 100 Mbps MPLS port is 7.3 times more expensive than equivalent broadband, reflecting market-driven premium pricing for guaranteed service commitments. This price premium exists globally without regulatory intervention, validating that the market appropriately prices service quality differentiation. Regulating tariffs without accounting for differentiated service commitments would undermine the ability of TSPs to deliver reliable managed connectivity and would be inconsistent with global practice.

9. Should the proposed regulation include staggered tariffs in line with service commitments, possibly further staggered for different regions, for both VPN & P2P based DLC? If yes, what are the service commitments, mentioned as reply to Q8, which should be considered for tariff regulation?

Reply: Yes, the proposed regulation may consider staggered tariffs linked to service commitments, and such differentiation based on region or location may also be considered depending upon service commitment and SLA requirements of specific customers. Though introducing tariff variation entirely based on geographical locations would add complexity and create uncertainty for enterprise customers with multi-location requirements but locational tariff differentiation should be driven solely by service commitment levels and quality parameters required by customers. Key service commitments that may be considered include:

Committed bandwidth and scalability, Uptime and availability guarantee, fault response and restoration timelines; and Level of redundancy and service management.

Ofcom's geographic market analysis provides a strong precedent for staggered tariffs. The UK employs four distinct regulatory zones: Central London (fully deregulated), High Network Reach areas (~9% of postcode sectors, light-touch regulation), Area 2 (~42%, CPI-X charge controls), and Area 3 (~46%, cost-based regulation). This geographic differentiation is driven by objective evidence of competitive conditions rather than arbitrary administrative boundaries. If TRAI adopts staggered tariffs, they should be linked to measurable competitive indicators—number of infrastructure-based providers, network reach, and actual market outcomes—rather than simple urban/rural classifications.

10. What reporting mechanisms should be mandated to ensure transparency in discounts and service bundling for DLCs? Please provide your response with justification.

Reply: Transparency in discounts and service bundling is important

primarily in the retail segment, where tariffs are standardised, customers are price-sensitive, and asymmetry of information is high. In contrast, enterprise DLC services are contract-driven offerings, negotiated on a case-by-case basis based on bandwidth, service commitments, tenure, redundancy etc.

Mandating detailed reporting of discounts or bundled pricing for enterprise DLCs would be impractical and counterproductive, as enterprise contracts involve confidential commercial terms, customised SLAs, and volume-based negotiations. Mandatory disclosure could compromise commercial confidentiality, reduce flexibility, and distort competition.

Accordingly, any reporting mechanism should be light-touch, limited to high-level disclosures such as confirmation of non-discriminatory practices and adherence to published reference offers, rather than contract-level discount reporting.

11. Should the Authority mandate standardized tariff disclosure formats for all DLC service providers? Please provide your response with justification.

Reply: Standardised tariff disclosure formats may be appropriate for retail telecom services, where offerings are uniform and customers require simple price comparison. However, mandating such formats for Domestic Leased Circuits (DLCs)—which are predominantly enterprise and customised services—would not be appropriate.

DLC tariffs are determined through commercial negotiations, taking into account bandwidth requirements, service commitments, network design, redundancy, tenure etc. A rigid, standardised disclosure format would fail to capture these variables and could mislead rather than inform enterprise customers. Further, compulsory disclosure of negotiated tariffs or structures could undermine commercial confidentiality and reduce pricing flexibility. Accordingly, the Authority should avoid mandating standardised tariff disclosure formats for enterprise DLCs.

Enterprise DLC services are bespoke, negotiated solutions—not retail products amenable to standardised disclosure. Globally, regulators distinguish between retail markets (where standardised disclosure protects consumers) and wholesale/enterprise markets (where sophisticated buyers negotiate terms). Even the OECD's Telecommunications Regulatory Institutional Structures and Responsibilities guidance explicitly notes that 'regulation should be proportionate' and that 'regulatory burdens should not exceed the benefits.' Standardised tariff disclosure for customised enterprise services would create a false impression of comparability while compromising commercial confidentiality.

12. Should TRAI use the same cost methodology i.e. BU-FAC for computing cost-based ceiling tariffs for P2P DLCs as was used in 2014? Please provide your response with justification.

Reply: Yes, same cost methodology i.e. BU-FAC for computing cost-based ceiling tariffs for P2P DLCs as was used in 2014 should be continued.

BU-FAC (Bottom-Up Fully Allocated Cost) is well-supported by international practice. BEREC's 2022 Regulatory Accounting report confirms that CCA-FAC (Current Cost Accounting-Fully Allocated Cost)—closely related to BU-FAC—is 'by far the most commonly used methodology for all markets' across EU National Regulatory Authorities. The ITU's 2021 Guidelines explicitly warn against using pure LRIC for leased lines, as it 'could lead to cost recovery difficulties.' BU-FAC ensures full common cost recovery, values assets appropriately, and provides a reasonable return on capital—all essential for protecting BSNL's massive infrastructure investments. The methodology has proven stable and predictable since 2014, and continuity serves both operator planning certainty and regulatory efficiency.

13. In case response to the above question is affirmative, what values of the following items should be used for estimation of ceiling tariffs for DLCs:

(i)	Return of Capital Employed (ROCE) -
(ii)	Useful lives of transmission equipment and Optical Fibre Cable separately- Respectively
(iii)	Average no. of fibre pairs lit in OFC in trunk segment and local lead segment separately-
(iv)	Utilization factor of OFC system in trunk segment and local lead segment separately
(v)	% of use for the transmission equipment used at local lead junction points and in trunk segment for DLCs
(vi)	If the repeaters are still being used in the trunk segment, what is the average distance between two repeater sites?-30 Km
(vii)	What is the factor of use (no. of circuits in underlying OFC system) to be taken into consideration at local lead and trunk segment for computation of ceiling tariffs?-

- i. 15% ROCE is acceptable & healthy.
- ii. Useful Life of OFC Equipment is 13 Years and Optical Fibre Cable is 18 Years.

A 15% ROCE is consistent with international benchmarks. Ofcom's most recent determination for BT's regulated activities applies a pre-tax nominal WACC of approximately 8-10%, but this reflects the UK's mature, low-risk market with established competition. India's higher country risk premium, infrastructure investment requirements, and BSNL's ongoing turnaround justify a higher return. The ITU recommends that ROCE should 'reflect the risks involved' in network deployment—BSNL's operations across India's most challenging geographies (Northeast, J&K, hilly terrain) carry substantially higher operational and investment risk than comparable European incumbents. A 15% ROCE appropriately compensates for these

elevated risks.

14. As an alternative to the BU-FAC methodology, or in addition to it, should LRIC or any other methodology be considered for computing ceiling tariffs for P2P DLCs? Please support your view with detailed justification along with data and assumptions

Reply: For computing ceiling tariffs for P2P DLCs, present BU-FAC methodology seems OK.

A comprehensive comparison of cost methodologies shows that BU-FAC provides the strongest investment protection among practical alternatives. Pure LRIC (Long Run Incremental Cost) must be avoided for leased circuits—it excludes common costs entirely, representing the majority of capital-intensive network elements like ducts, trenches, and buildings. The ITU and BEREC explicitly warn against this. LRIC+ (with Equi-Proportional Mark-Up) is the EU-recommended standard and would also be acceptable, as it recovers common costs through proportional allocation. However, switching from BU-FAC to LRIC+ would introduce unnecessary transition complexity without material benefit. The EC's 2013 NDCM Recommendation (2013/466/EU) explicitly reserves pure LRIC for voice termination only, recommending BU-LRIC+ for all wholesale access pricing. Given India's established BU-FAC framework with audited cost data since 2014, continuity is both practical and principled.

15. What should the bandwidth capacities be, including the minimum and maximum bandwidth capacity, of P2P DLC for which ceiling tariffs need to be prescribed? In case of bandwidth capacities not regulated in the 2014 TTO, what should be the concomitant value of the relevant factors mentioned at Q13? Please provide your response with justification.

Reply: Ceiling tariffs for P2P Domestic Leased Circuits (DLCs) should be prescribed only for standard, widely used bandwidth capacities, where demand is relatively homogeneous and market maturity exists. The minimum regulated bandwidth may start from 10 Mbps, as this is the entry-level enterprise requirements in present days, while the maximum regulated bandwidth may be limited to 10 Gbps. Beyond this level, circuits are typically highly customised, involving special routing, protection, and design.

The proposed bandwidth range of 10 Mbps to 10 Gbps is consistent with international practice. Ofcom regulates Ethernet leased lines from 1 Gbps down to 10 Mbps, while circuits above 10 Gbps face progressively lighter regulation. The FCC's 2017 BDS Order fully deregulated all circuits above DS-3 (45 Mbps). Below the minimum threshold, circuits serve niche requirements best addressed through commercial negotiation; above the maximum, circuits are highly customised infrastructure solutions requiring bespoke engineering and pricing.

16. Should the Authority consider the cost methodologies used in other countries for determining tariffs for P2P-DLCs? If so, which methodologies would be appropriate for the present exercise? Please provide your response with justification along with data and assumptions.

Reply: Telecom markets across countries differ significantly in terms of network topology, population density, right-of-way regimes, labour costs, spectrum policy, service obligations, and regulatory history. Many international models are designed for mature, low-growth markets with limited geographic diversity and cannot be readily applied to India's scale and complexity.

India has the advantage of extensive operational experience, multiple tariff orders, and rich, audited cost and traffic data generated over decades by large TSPs. This includes detailed information on fiber deployment, asset lifecycles, utilisation levels, redundancy costs, and service commitments across varied geographies.

Accordingly, the present exercise should primarily rely on India-specific cost data and assumptions, rather than adopting foreign methodologies that may not reflect Indian realities.

While international cost methodologies provide useful reference points, they must not be mechanically transplanted to India. Key structural differences include: (a) India's population density varies from 11,000+ per sq km (Delhi) to under 20 per sq km (Arunachal Pradesh)—a 550x range unmatched by any European country; (b) India's right-of-way regime involves multiple government agencies with varying charges and timelines; (c) labour costs, while lower in absolute terms, are offset by challenging terrain and climate conditions in many circles; (d) India's service obligations require nationwide coverage including remote and strategically important areas. The EU's own experience is cautionary—European telecom investment fell from 33% of global private telecom investment in 2003 to less than 20% by 2013, contributing to an estimated €110-170 billion investment shortfall. The USA, with lighter regulation, sees telecom companies invest at twice the per capita rate of European operators.

17. Is there a need for prescribing separate ceiling tariffs for local lead and trunk segment? Should the Authority adopt different cost methodology for local lead and trunk segment for provisioning of DLCs? If yes, please provide your response with justification.

Reply: There is no need to alter the fundamental tariff structure or adopt a new cost methodology for local lead and trunk segments. Instead, the Authority may continue with the existing distance-wise approach, with updated cost inputs where required.

The existing distance-based approach with separate implicit cost treatment for local lead and trunk segments has worked effectively since 2014.

Ofcom's UK framework does distinguish between 'interconnection' (trunk) and 'access' (local lead) segments for regulatory purposes, but this distinction reflects a mature, well-documented cost base built over decades. Introducing a new formal separation in India would require extensive cost modelling, data collection, and industry consultation—adding regulatory complexity without proportionate benefit. Updated cost inputs within the existing framework are sufficient.

18. Should the Authority adopt BU-FAC, LRIC or any other methodology for computing ceiling tariffs for VPN DLCs? Please support your view with a detailed justification along with data and assumptions.

Reply: VPN DLCs (such as MPLS-VPN) are managed, value-added enterprise services, fundamentally different from basic point-to-point connectivity, and are not amenable to rigid cost-plus tariff determination. VPN DLCs are best offered under commercially negotiated, market-driven pricing, with transparency through reference offers rather than ceiling tariffs.

No major regulator applies cost-based ceiling tariffs to MPLS-VPN or equivalent managed network services. This is the single most important finding from the international regulatory survey. VPN DLCs involve shared MPLS/IP cores where costs are non-linear and driven by traffic engineering, QoS classes, redundancy, security, and 24x7 service management—not bandwidth alone. The appropriate regulatory approach, consistent with global practice, is to ensure VPN DLC pricing is commercially negotiated with transparency through published reference offers. The EU's SMP framework, Ofcom's WFTMR, and the FCC's classification all support this position. Applying BU-FAC, LRIC, or any rigid cost methodology to VPN DLCs would be a regulatory outlier with no international precedent.

19. What should the bandwidth capacities, including the minimum and maximum bandwidth capacity, of VPN DLC for which ceiling tariffs need to be prescribed? Please provide your response with justification.

Reply: The reply of this instant question may be treated in line with the reply as given in question no. 3.

Since MPLS-VPN based DLCs should not be brought under tariff regulation (as argued in Q3 and Q18), the question of prescribed bandwidth capacities for VPN DLCs does not arise. Globally, VPN service bandwidth is commercially negotiated based on customer-specific requirements. No regulator prescribes bandwidth-specific ceiling tariffs for managed VPN services.

20. Should the Authority consider the cost methodologies used in other countries for determining tariffs for VPN-DLCs? If so, which

methodologies would be appropriate for the present exercise? Please provide your response with justification along with data and assumptions.

Reply: India has a large, diverse, and highly competitive enterprise connectivity market, supported by extensive historical data, audited cost information, and operational experience of large TSPs. VPN-DLCs rely on shared MPLS/IP cores, where costs are non-linear and driven by traffic engineering, QoS classes, redundancy, security, and 24×7 service management rather than bandwidth alone. Foreign cost models typically assume stable demand, high utilisation, and homogenous networks—assumptions that do not hold for India’s scale and heterogeneity.

Accordingly, the present exercise should rely on India-specific data and market outcomes, with VPN-DLCs remaining under commercially negotiated, market-driven pricing.

The argument against adopting foreign cost methodologies for VPN-DLCs is even stronger than for P2P-DLCs. No comparable country regulates VPN-DLC tariffs, so there is no foreign ‘methodology’ to adopt—the international consensus is that these services should be commercially priced. The ‘Ladder of Investment’ theory—which predicted that regulated wholesale access would encourage entrants to progressively invest in their own infrastructure—failed in Europe. Its own author, Martin Cave, described its misapplication as ‘regulator-promoted arbitrage which allows resellers to buy cheap at wholesale prices and attack the incumbent’s margin.’ India should learn from this experience and avoid extending tariff regulation to managed services where competition is demonstrably effective.

21. Should the spectrum charges recommended for a point-to-point link of 28 MHz paired bandwidth in the 6 GHz(lower) band, be taken as reference for DLC ceiling tariff? If yes, what could be the approximate order of multiple between the backhaul link charges and DLC ceiling tariff? Should the reference be considered for local lead or trunk segment or on overall basis? Please provide your response with justification.

Reply: No, BSNL is using UBR (unlicensed Radio Band) for providing P2P DLCs and 6 GHz band has been surrendered by BSNL.

Since BSNL has surrendered the 6 GHz band and uses unlicensed radio bands for P2P DLCs, using spectrum charges for the 6 GHz band as a reference point would be fundamentally misaligned with BSNL’s actual cost structure. Spectrum-based references are appropriate only where the regulated service actually uses the referenced spectrum. This is a basic principle of cost-based regulation recognised by the ITU and all major regulators.

22. Is the distance-based pricing, based on distance slabs contained

in the 2014 TTO (57th Amendment), still relevant for prescribing ceiling tariffs for P2P DLCs? Should the Authority consider new distance slabs, separately for both the local lead and trunk segments, for prescribing ceiling tariffs for P2P DLC? Please provide your response with justification

Reply: Yes, the distance-based pricing framework prescribed under the 2014 TTO (57th Amendment) continues to remain relevant and appropriate for prescribing ceiling tariffs for P2P DLCs. Distance remains a key cost driver for DLC provisioning, particularly for the trunk segment, as it directly impacts fiber length, route diversity, maintenance effort, and operational complexity. The existing distance slabs have provided transparency, and stability, and the industry has aligned its network planning and investments accordingly.

There does not seem any compelling need to introduce new distance slabs or separate slab structures for local lead and trunk segments. The current framework already captures cost variation adequately, supported by years of operational and cost data. Any change in slab structure would increase complexity and uncertainty without proportionate benefits.

Distance-based pricing for leased circuits is the established norm internationally. Both the UK (Ofcom) and EU frameworks recognise distance as a primary cost driver for wholesale leased line access. Ofcom's charge controls for Ethernet Access Direct explicitly incorporate distance in the pricing formula. The FCC's pre-deregulation framework also used distance-based tariff structures for regulated circuits. The existing 2014 TTO distance slabs have provided over a decade of stability, predictability, and industry alignment. Changing the slab structure would create transition costs and market uncertainty without demonstrated regulatory benefit.

23. Is there a need for prescribing separate ceiling tariffs for remote and hilly areas? What criteria should be used to define such regions? Please provide your response with justification.

Reply: Yes, there is a need to prescribe separate ceiling tariffs for remote and hilly areas, as the cost of provisioning and maintaining P2P DLCs in such regions is significantly higher than in plains and urban areas. TSPs incur additional costs due to difficult terrain, longer fiber routes, limited right-of-way availability, challenging weather conditions, higher maintenance effort, lower capacity utilisation, and extended fault restoration timelines. 20% additional charges for remote and hilly areas may be prescribed so that the investment cost may be recovered to some extent.

International data strongly supports higher tariffs for remote and hilly areas. GSMA Intelligence benchmarking shows that operating costs per site in remote areas are approximately 2x those in urban areas, while revenue per site can be up to 95% lower. The fiber deployment in rocky/mountainous terrain costs approximately USD 20/ft—double the USD 10/ft for soft earth. Labour accounts for 75% of underground deployment costs, and challenging

terrain significantly increases labour requirements.

The proposed 20% additional charge may in fact be conservative given these cost multipliers. In the USA, the FCC's Universal Service Fund spends USD 4.2 billion annually through its High-Cost Program specifically to subsidise rural telecom service. The World Bank explicitly advocates geographically de-averaged pricing to reflect cost differences. BSNL operates across India's most challenging geographies (Northeast, J&K, Himachal Pradesh, Uttarakhand, Ladakh), and a 20% premium is the minimum necessary to partially offset these documented cost differentials.

24. How can the Authority ensure affordability in low-competition areas, such as remote and hilly areas, without distorting market incentives? Please provide your response with justification.

Reply: DLCs are not retail consumer services; they are enterprise connectivity solutions used by businesses, government entities, banks, utilities, and large institutions that typically have significant paying capacity and mission-critical requirements. So question of affordability does not arise. Imposing strict affordability-driven price controls in such areas is like discouraging infrastructure investment where costs are inherently higher. Instead, affordability concerns—where genuinely required—may be addressed through targeted support mechanisms, such as government-funded connectivity programs, or viability-gap funding.

Globally, affordability in low-competition areas for enterprise-grade services is addressed through supply-side mechanisms (infrastructure subsidies, USOF funding, viability-gap funding) rather than demand-side tariff suppression. The US Universal Service Fund's High-Cost Program, the EU's Connecting Europe Facility, Australia's Building Better Regions Fund, and our own USOF/DBN all follow this model. Suppressing DLC ceiling tariffs in remote areas would achieve the worst possible outcome: operators would have even less incentive to invest in these areas (due to non-compensatory tariffs), while the supposed beneficiaries—enterprise customers with significant paying capacity—would face poorer service quality due to under investment. The Authority should explicitly recommend that affordability gaps in enterprise connectivity be addressed through USOF or similar targeted funding mechanisms.

25. Are there any other relevant issues related to revision of tariff framework for DLCs which the Authority should keep in mind, while carrying out the present review exercise, to further the broad objectives as espoused in this Consultation Paper? Please provide full details and justification for consideration of the same.

Reply: The Authority should consider several additional structural issues supported by international evidence:

First, the global regulatory trajectory is unambiguously toward deregulation

of leased circuits. The USA has near-completely deregulated (FCC's 2017 BDS Order, 2025 detariffing proposal); Japan has no price regulation for leased lines; Australia has deregulated 412 exchange service areas; the UK progressively deregulates by geographic zone. No comparable economy is introducing new price regulation for leased circuits. India would be moving against the global tide by tightening DLC tariff regulation.

Second, academic evidence consistently shows that excessive tariff regulation suppresses infrastructure investment. Grajek and Roller (2012), studying 180 operators across 25 EU countries over a decade, found that 'access regulation has a negative effect on both total industry and individual carrier investment.' The EU's telecom investment share fell from 33% to under 20% of the global total between 2003 and 2013. American telecom companies invest at twice the per capita rate of European operators.

Third, Suppressing DLC tariffs below cost-recovery levels would directly undermine the return on BSNL's massive public investment at the very moment BSNL's turnaround is gaining momentum.

Fourth, NDCP 2018 commits to a 'light-touch regulatory regime' and to 'reducing regulatory burden and barriers that hamper investment.' With 31+ licensed NLDOs authorized to offer DLC services and actual market competition varying dramatically by geography, the evidence supports geographic differentiation—with forbearance in competitive markets and retention of ceilings only in demonstrably uncompetitive areas. TRAI's own practice of extending forbearance to mobile tariffs, broadband tariffs, and DLCs below E1 capacity supports this approach.

Fifth, any tariff framework revision should maintain a clear distinction between access providers and infrastructure owners. Extending DLC eligibility to ISPs lacking end-to-end network ownership and service assurance capability would create regulatory asymmetry, encourage cherry-picking of profitable urban markets, and undermine the cross-subsidization model that supports nationwide connectivity—particularly in strategically important border and remote areas where BSNL is often the sole service provider.


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