RJIL/TRAI/2025-26/613

4th November 2025

To,

Shri Akhilesh Kumar Trivedi,

Advisor (Networks, Spectrum and Licensing)

Telecom Regulatory Authority of India,

Tower-F, World Trade Centre,

Nauroji Nagar, New Delhi – 110029.

Subject: **RJIL's comments on TRAI's Consultation Paper on Auction of Radio Frequency Spectrum in the Frequency Bands Identified for International Mobile Telecommunications (IMT).**

Dear Sir,

Please find enclosed the comments of Reliance Jio Infocomm Limited (RJIL) on the TRAI's **Consultation Paper on Auction of Radio Frequency Spectrum in the Frequency Bands Identified for International Mobile Telecommunications (IMT)** dated 30.09.2025.

Thanking you,

Yours Sincerely,

For **Reliance Jio Infocomm Limited**

KAPOOR SINGH GULIANI

Digitally signed by KAPOOR SINGH GULIANI
Date: 2025.11.04 21:38:41 +05'30'

Kapoor Singh Guliani

Authorized Signatory

Enclosure: As above

Reliance Jio Infocomm Limited's comments on TRAI's consultation paper on "Auction of Radio Frequency Spectrum in the Frequency Bands Identified for International Mobile Telecommunications (IMT)" (Consultation Paper No. 8/2025 dated 30th September 2025)

Preface

1. We appreciate the opportunity provided by the Telecom Regulatory Authority of India (TRAI) to present our views on the "Consultation Paper on the Auction of Radio Frequency Spectrum in the Frequency Bands Identified for International Mobile Telecommunications (IMT)."

2. India's telecom sector has played a defining role in the country's digital transformation journey. With over a billion mobile connections and rapidly expanding broadband networks, the sector forms the backbone of the Digital India vision. As India prepares for 6G and beyond, the policy and regulatory framework for spectrum management will be pivotal in enabling technology leadership, fostering innovation, and supporting national initiatives such as **Aatmanirbhar Bharat**, **Viksit Bharat**, and **Digital India**.

3. While the industry continues to invest heavily in infrastructure upgradation—from 4G to 5G and soon 6G—the revenue growth and affordability dynamics have not kept pace with the escalating capital and operational costs. Therefore, it is crucial that spectrum pricing and auction design facilitate sustainable investment, efficient utilization, and equitable access to affordable broadband services for all citizens.

4. The Government's landmark reforms in 2021 significantly improved sectoral liquidity and policy certainty. The next logical step is to build on those reforms through pragmatic and forward-looking measures in spectrum allocation and pricing. TRAI's recommendations in this regard will play a vital role in ensuring that India maintains its momentum toward inclusive and technology-driven growth.

5. In this submission, we have provided our detailed comments and recommendations with the objective of ensuring a progressive, investment-friendly, and innovation-oriented spectrum policy that promotes universal, affordable, and high-quality digital connectivity across India.

A. Spectrum availability

6. We submit that one of the most important facilitative factors to empower the annual auction calendar fixed by the Cabinet would be to include all globally recognized IMT

bands in the auction. This measure will ensure that the TSPs can plan for their long-term CAPEX and OPEX investments in holistic manner with a clear perspective on spectrum availability.

7. **All the spectrum referred by the DoT for auction along with the entire 6 GHz band and spectrum in 37-37.5 GHz, 37.5-40 GHz, and 42.5-43.5 GHz already recommended for auction by the Authority should be auctioned in the upcoming auctions. In addition, the pending auction of spectrum in V-Band and E-Band and backhaul spectrum bands should also be included in the auction recommendations.**

8. **Mid-Band Spectrum required for 6G:**

- **India's Leadership Aspiration in 6G**: India has set an ambitious vision to take a global lead in 6G—both in terms of indigenous technology development and the early rollout of world-class networks. Achieving this objective requires a clear demonstration of intent through timely and adequate allocation of spectrum that can drive the entire ecosystem of research, innovation, and network deployment. The policy and regulatory framework must therefore facilitate availability of sufficient, harmonized, and contiguous spectrum to enable India's leadership in 6G technologies.

- **Global Spectrum Requirement Projections**: Leading international organizations and technology bodies, including Ericsson and Nokia, have indicated that approximately **750 MHz of mid-band spectrum per operator**, or roughly **3 GHz in total**, will be required to effectively deliver 6G services. This spectrum demand includes allocations in the **7–15 GHz range**, which is being recognized globally as the "upper mid-band" suitable for wide-area IMT deployments.

  Nokia Report[1]:- *"Considering that most markets, including India, typically host three to four mobile operators, and assuming that the currently available mid-band spectrum (~1 GHz) will be primarily reused for existing IMT applications, an additional 500–750 MHz of new mid-band spectrum per network will be required to meet 6G demand."*

  Ericsson Report[2]:- *"Wide-Area Use Cases Driving Mid-Band Spectrum Demand -The wide-area 6G use cases—such as holographic communication,*

[1] https://www.nokia.com/6g/spectrum-for-6G-explained/

[2] https://www.ericsson.com/en/reports-and-papers/white-papers/6g-spectrum-enabling-the-future-mobile-life-beyond-2030

the Internet of Senses, immersive metaverse experiences, massive digital twins, and exponential mobile broadband growth—necessitate at least 3 GHz of wide-area spectrum. These use cases depend on seamless indoor and outdoor mobility and cannot be supported through fragmented or narrow spectrum holdings."

9. **India's Unique Context Justifying Higher Spectrum Allocation**: While determining the spectrum quantum for 5G and 6G, India's specific demographic and infrastructural characteristics must be duly considered:

   a. **Exceptionally High Population Density:** India's population density of approximately **481 persons per sq. km** is over three times that of China (150) and nearly twelve times that of the United States (40). Consequently, Indian networks face a unique **"demand density"** challenge, where a single cell site must serve exponentially more users. This makes **large, contiguous spectrum blocks** indispensable for maintaining service quality and network economics.

   b. **Low Fixed Broadband Penetration:** India's fixed broadband penetration stands at only **~15 households per 100**, compared with **~95 in China**, **~93 in the United States**, and **~97 in South Korea**. China is expected to reach 600 million fiber-connected homes by 2030. India, by contrast, remains heavily dependent on **wireless connectivity** to deliver broadband access under the Digital India mission. Hence, the spectrum allocated for mobile broadband must compensate for this fixed-line deficit.

10. **Need for Allocation of Full 6 GHz Band to IMT**: As a critical first step, it is imperative that the Authority re-examines the allocation of the entire **1200 MHz of spectrum in the 6 GHz band (5.925–7.125 GHz)** for IMT use. While **700 MHz in the upper 6 GHz band** (6.425–7.125 GHz) is under consideration for IMT, the **500 MHz in the lower 6 GHz band** (5.925–6.425 GHz) is proposed for very low-power, delicensed use. The 6 GHz band serves as the **anchor mid-band** for ubiquitous 5G and 6G coverage. Given the limited availability of suitable mid-band spectrum in India, **the entire 6 GHz band must be allocated for IMT services**. Delicensing any portion of this band would be counterproductive, as such decisions are typically **irreversible** and risk creating long-term interference, unfair and discriminatory for licensed use in the adjacent part of same band, and inefficient spectrum utilization. Accordingly, we respectfully submit that the **entire 6 GHz band (5.925–7.125 GHz)** be earmarked and auctioned in a technology neutral manner for IMT/6G and any other technology based deployment, ensuring India's readiness for next-generation connectivity.

11. **Need for Auctioning the Entire 1200 MHz Spectrum in the 6 GHz Band:** We respectfully submit that the entire 1200 MHz spectrum in the 6 GHz band (5.925–

7.125 GHz) should be included in the forthcoming auction process, in a technology neutral manner, to ensure predictability, transparency, and investment certainty for Telecom Service Providers (TSPs). While it is recognized that only 400 MHz in the upper 6 GHz band is immediately available, and that the remaining 800 MHz (comprising 300 MHz in the upper portion and 500 MHz in the lower portion) will become available subsequently upon vacation of existing satellite usage, a holistic approach to spectrum assignment is essential. Auctioning the entire 1200 MHz—even if major portions of it are made available in phases—will enable operators to plan long-term investments in 6G networks and infrastructure with clarity on future spectrum availability.

12. To ensure prudence and accountability, the payment obligations, roll-out conditions, and spectrum tenure may be stipulated to commence from the date of actual assignment of the complete & contiguous spectrum bided by any entity. This approach will ensure alignment between financial commitment and physical availability of spectrum, while providing certainty for long-term investment planning.

13. Further, to ensure the participation of only serious and credible bidders, the Authority may consider requiring the successful bidder to deposit approximately 5% of the auction-determined price upon the conclusion of the auction. Such an upfront payment will serve as a firm commitment of intent while simultaneously generating resources that could be utilized to fund the migration of existing satellite operations to alternate frequency bands before 2030, if not before 2028.

14. This approach strikes a balanced policy framework — ensuring transparency, fiscal prudence, and investment predictability — while accelerating India's preparedness for 6G technology deployment.

15. **Need to include Satellite D2D spectrum Band viz. L and S band in auction framework**

    a. We submit that the L and S band globally are referred to as the Mobile Satellite Service (MSS) band and are useful for Direct-to-Device (D2D) services. We submit that these should be treated at par with the IMT spectrum and included in the auction. This will allow a unified, software-defined network framework that supports D2D and other non-terrestrial innovations under the 6G umbrella and would give a big coverage boost to services providers.

    b. It is pertinent to note here that the emerging global trend indicates that satellite operators like Starlink are leveraging spectrum in the range across 1600 MHz to 2600 MHz to offer D2D services. These operators are ensuring

that satellites can be very much like a Base Station in the SKY and there is no need for any device change as these are like just another gNodeB. Another known case is the iPhone tying up for S-band through Globalstar to offer their services globally. Including these bands in the auction will give the global and Indian service providers an option to enter this market with dedicated spectrum capacities.

16. **On Concerns of Over-Supply and Competition in Spectrum Auctions**: The concerns expressed in the consultation paper regarding potential "over-supply" of spectrum and lack of competition are misplaced and inconsistent with current market realities. With rapid technological evolution, regular auctions, and a liberalized licensing regime, spectrum assignment should no longer be viewed through a narrow economic lens of **"auctioned vs. sold"** or **"reserve price vs. market price."** Spectrum auctions serve as a **transparent and non-discriminatory mechanism** for equitable access to this national resource. Even when demand is lower than supply, or spectrum is sold at reserve price, the auction remains the most transparent method of assignment, consistent with the principles of fairness, equity, and non-arbitrariness enshrined in law.

17. **Re-Defining Auction Success Criteria**: When the Government's stated policy objective is **not revenue maximization**, the success of a spectrum auction should not be measured by the quantum of revenue raised or the percentage sold above reserve price. Instead, success must be defined by:
    a. Absence of post-auction disputes;
    b. Equal opportunity to all eligible participants—new or existing; and
    c. Efficient utilization of spectrum for expanding digital connectivity.

    Any artificial scarcity by limiting supply would be contrary to both economic logic and the national interest.

18. **Entry Conditions and Competition**: The consultation paper's suggestion of permitting entities with lower entry-fee authorizations to participate in spectrum auctions will neither enhance competition nor contribute meaningfully to sectoral growth. The entry fee for most service authorizations is negligible compared to the spectrum cost, and therefore, does not constitute a genuine barrier to entry. Any entity—new or existing—can participate in auctions by submitting an undertaking to obtain the relevant authorization. Accordingly, creating differentiated categories of licensees based on entry fee or authorization type would serve no real purpose and could instead give rise to **regulatory uncertainty and disputes** regarding the scope of license and permissible services.

19. **Adequacy of the Current Auction Framework**: The existing spectrum auction framework is **robust, transparent, and flexible**, ensuring open participation and fair competition among all eligible entities. It sufficiently safeguards the twin objectives of **efficient spectrum use and non-discriminatory access**. Hence, no further alteration or introduction of special categories of licensees is warranted.

B. Technology Neutrality:

20. Since spectrum assigned through auction is assigned at market-determined prices, such spectrum should continue to be permitted for deployment across diverse use cases in a technology-neutral manner — including Access, Backhaul, Integrated Access Backhaul (IAB), and other permissible applications. The use of such spectrum shall not be restricted or limited on account of the exclusion of certain use cases from the auction mandate as prescribed under Schedule I of the Telecommunication Act, 2023. Furthermore, with the emergence of Non-Terrestrial Networks (NTN), the successful bidder should also be permitted to utilise the assigned spectrum for NTN operations.

C. Valuation of spectrum and reserve price

21. IMT spectrum is now easily divisible in two separate categories of spectrum viz. coverage spectrum and capacity spectrum.

22. **Coverage spectrum:** This is the sub-1-GHz spectrum that is essentially the ether of telecom services; it is required for all applications and is the bedrock on all telecom networks. The meeting of massive coverage requirements over a diverse landmass are possible only with this spectrum. However, the issue with this spectrum is that it is in short supply and is being eyed by even the non-auction Government assignees like Railways. The overall availability of this spectrum in 600 MHz, 700 MHz, 800 MHz and 900 MHz bands is only around 100 MHz per LSA for commercial IMT services. This is inclusive of spectrum reserved for BSNL/MTNL. Thus, the effective auction-able spectrum is even lower, somewhere in the range of 80-85 MHz per LSA and of which spectrum in range of 41.8-51.8 MHz in a LSA is available in LSA with median availability being around 47 MHz in upcoming auction.

23. This leads us to the 40 MHz spectrum left in the newly standardized 600 MHz band, making this the most useful spectrum band in sub-1-GHz being auctioned ever in Indian auction history, with capabilities of being an anchor coverage band for any network. Further, post 3GPP standardization of the APT 600 MHz band under its new nomenclature of n105 for 5G-NR under the 3GPP technical report TR 38.892, there is a lot of global traction in this spectrum band. We further submit that following that,

the 3GPP has fully completed all of the standardization work related to band n105 (i.e., APT 600 MHz Band"). Further, 3GPP, while fully realizing that the true ecosystem development may require all necessary band combinations that are relevant for Asia Pacific and particularly India, the 3GPP RAN4 group has been consistently working towards adding several band combinations from 2CC to 6CC that include the n105 along with the frequency bands that are typically used for IMT in Region 3 (including those in India).

24. Additionally, the device eco-system related concerns can be easily addressed as there are existing networks in this band, and leading chipsets are already supporting this band. Further, India's entry will only give necessary impetus to device ecosystem leading to early availability.

25. Further from spectral efficiency perspective this band is more effective than its nearest sub-1-GHz band i.e. 700 MHz band. As per our analysis the propagation loss in this band will be around 1.2dB less than 700 MHz band while the penetration loss will also be lower. We have detailed the calculations in response to question 36 in subsequent section.

26. Thus, the only decision for the Authority is on how much premium over 700 MHz spectrum Auction Determined Price (ADP) should be put on this band as an opportunity cost, being the last sub-1-GHz band. We submit that from the perspective of this being the last 3GPP standardized sub-1-GHz IMT band going for auction and the future role of this spectrum, its valuation should not be less than 2 times the ADP of 700 MHz. This will also absorb the indexation as the 700 MHz spectrum ADP is of 2022. Furthermore, this will be in line with international auction price, most critically in USA.

27. **Capacity Bands:** These are the (i) FDD-midbands i.e. 1800 MHz, 2100 MHz bands; (ii) TDD midbands 2300 MHz, 2500 MHz, 3300 MHz and 6 GHz bands; and (iii) mmWave bands i.e. 26 GHz, 37-37.5 GHz, 37.5-40 GHz, and 42.5-43.5 GHz.

28. Of the spectrum bands proposed to be auctioned under the DoT reference, the spectrum in 1800 MHz, 2100 MHz, 2300 MHz, 2500 MHz, 3300 MHz and 26 GHz were recently put to auction in 2022 and 2024. Thus, a market price and a subsequent valuation are already available for these bands in almost all LSAs. We submit that owing to the massive capacities already deployed in these bands, the availability and consequently the demand for incremental spectrum in these bands is not very high. However, there is no reason for discontinuing with the last auction determined price for these bands.

29. The valuation of new band, i.e. 6 GHz band, is a little tricky as this spectrum will be fully available only in 2030 and the current availability is fragmented in two parts, while a major portion of the spectrum i.e. 500 MHz spectrum in lower 6 GHz band is being discussed for delicensing.

30. Further, the device ecosystem is evolving and there are plans to use this spectrum for both 5G or subsequent 6G technologies. Furthermore, this is the only mid-band capacity band spectrum available in contiguous manner and would be critical in creating large channel width to the tune of 400 MHz per operator in mid-band 5G and 6G deployment, while more spectrum is made available in other mid-bands for meeting requirements of all TSPs. Additionally, the attractiveness of any sub-band within 6 GHz spectrum band may vary based on ecosystem availability and other factors and auctioning partial spectrum in phases could harm interests of service providers. Thus, entire 1200 MHz of this spectrum should be auctioned immediately, and the successful bidders should be offered a delayed payment option to account for delayed availability and evolving eco-system. Further, as this band is closer to 3300 MHz band with higher frequency, its valuation should be benchmarked with valuation of 3300 MHz band and should be at 20% of the valuation of 3300 MHz band as this spectrum will have 6 dB higher path loss in propagation; higher penetration loss in comparison to 3300 MHz band and will require higher uplink budget for 5G and 6G services. Thus, the area covered by this band would be only 20% of the area covered by the 3300 MHz band. We have provided a detailed technical explanation in response to the questions 32 to 35 in subsequent section. This valuation will be in line with the only international auction-based valuation in Hong Kong normalized with area covered and revenue potential of spectrum.

31. **Reserve Price:** We submit that while consideration of above points will lead us to optimum valuation of the spectrum, the most critical factor in increasing the competitive intensity and to discover true market value of the spectrum would be optimum reserve price. **We submit that 70% of valuation as reserve price is too steep and not conducive of wider participation in auction and throttles competition. It has resulted in selling the spectrum at reserve price and does not lead to discovery of market determined price with competition. Besides obviating the possibility of true market price discovery, it also acts as a deterrent for new entrants, which is evident from past experience. Therefore, we request the Authority to reduce the reserve price to 50 % of the spectrum valuation.** We submit this may help in discovery of true market price and will be beneficial in longer run as it will increase spectrum uptake, maximize the overall return instead of maximizing the unit price and will also help in meeting proliferation goals while at the same time increasing the overall license fee proceeds.

D. Spectrum Caps

32. **Rationale and Relevance of Spectrum Cap:** We respectfully submit that the original intent behind prescribing spectrum caps was to ensure adequate competition in the market and to prevent monopolization of this valuable national resource. Spectrum caps were conceived at a time when spectrum availability was limited, and the market structure was nascent.

33. However, in the present context—where spectrum availability has significantly expanded across multiple bands and the market dynamics have evolved—the concerns of monopolization, over-supply, and auction failure cannot be equated or addressed through the same regulatory instrument. These issues are distinct in nature and must not be conflated.

34. With the advent of large quantum of spectrum, evolving technologies, and rationalization of reserve prices, the justification for retaining spectrum caps has become largely redundant. The market has matured to a point where the natural discipline of demand, network economics, and competition law safeguards are sufficient to prevent any undue concentration of spectrum holdings.

35. Accordingly, we submit that the concept of spectrum caps has outlived its relevance and should now be phased out. Telecom Service Providers (TSPs) should be allowed the flexibility to consolidate contiguous spectrum holdings within a particular band to create larger bandwidth channels. Such consolidation is essential for efficient spectrum utilization and for delivering the enhanced speeds and capacity required for 5G-Advanced and 6G technologies. Restricting TSPs through artificial caps only compels them to acquire fragmented spectrum across multiple bands, thereby increasing inefficiency and cost without corresponding consumer benefit.

36. **Alternative Proposal in Case Spectrum Caps Are Retained:** Without prejudice to the above, and in the event that the Authority considers it appropriate to continue with spectrum caps, we submit that the grouping of spectrum for the purpose of applying such caps should be based on uniform technical and propagation characteristics of the frequency bands. Arbitrary aggregation of bands with divergent propagation properties results in distortions and does not align with the underlying policy intent of ensuring fair competition. Accordingly, we propose the following rationalized grouping and cap structure:

    a. **Sub-1 GHz FDD Bands:** This group shall include the 600 MHz, 700 MHz, 800 MHz, and 900 MHz bands. The spectrum cap for this group may be fixed at

40% of the total spectrum available in these bands within each Licensed Service Area (LSA).

b. **Mid-Band FDD Bands:** This group shall include the 1800 MHz and 2100 MHz bands. The spectrum cap for this group may be fixed at 40% of the total spectrum available in these bands within each LSA.

c. **Mid-Band TDD Bands:** This group shall include the 2300 MHz, 2500 MHz, 3300 MHz, and 6 GHz bands. The spectrum cap for this group may be fixed at 50% of the total spectrum available in these bands within each LSA.

d. **High-Band (mmWave) TDD Bands:** This group shall include the 26 GHz, 37–37.5 GHz, 37.5–40 GHz, and 42.5–43.5 GHz bands. The spectrum cap for this group may be fixed at 50% of the total spectrum available in these bands within each LSA.

37. The above grouping structure ensures that caps—if at all retained—are technology-neutral and propagation-consistent while allowing operators sufficient operational flexibility to aggregate spectrum efficiently for next-generation network deployment.

E. Roll-Out Obligations

38. **Existing Roll-Out Obligations:** We respectfully submit that, as per the prevailing conditions under the Notice Inviting Applications (NIA), the roll-out obligation shall be deemed to have been fulfilled once the requisite number of district headquarters, block headquarters, or rural Short Distance Charging Areas (SDCAs) are covered by a licensee through the use of any technology in any spectrum band. This flexible, technology-neutral approach has ensured effective network expansion while allowing service providers the operational freedom to determine the most efficient deployment strategy. In view of this, the existing roll-out framework sufficiently meets the policy objectives for all currently assigned spectrum bands. Any modification to these obligations is unwarranted and may create uncertainty without delivering additional public benefit.

39. **Roll-Out Obligations for New Spectrum Bands:** With respect to spectrum bands being put to auction for the first time, we submit that roll-out obligations—if considered necessary—should be formulated in a proportionate and pragmatic manner. These should be derived from the existing NIA benchmarks after taking into account:
    - The readiness of the device ecosystem,
    - The deployment feasibility and technology maturity, and

- The global and national band plans adopted for such spectrum.

40. Any unduly stringent roll-out requirements for nascent bands could impede network planning, raise costs, and discourage timely investment. We further submit that the Authority should not reassign or indirectly transfer the responsibilities of the Universal Service Obligation Fund (USOF) to licensees through roll-out obligations. The USOF has a distinct statutory purpose and administrative mechanism, and its functions should not be conflated with market-based deployment obligations imposed on licensees.

41. **Roll-Out Obligations for the 6 GHz Band:** We also submit that the roll-out obligations for the 6 GHz band—which is presently only partially available—should become applicable only after the entire band, or at least 300 MHz of contiguous spectrum, is assigned to licensees. As elaborated in our response to the relevant consultation question, early imposition of deployment requirements on a fragmented or partially available band would be technically inefficient and economically unviable. The roll-out schedule for the 6 GHz band should therefore be aligned with the complete availability and harmonization of the band to ensure orderly, cost-effective, and future-ready deployment.

F. Spectrum tenure and auction payment methodology

42. **Tenure of Spectrum Assignment**: We respectfully submit that the **increase in the tenure of auctioned spectrum from 20 years to 30 years** was one of the key **telecom sector reforms approved by the Union Cabinet in September 2021**. This reform was intended to enhance long-term policy stability, certainty of resource assignment, improve business viability, and facilitate sustained investment in advanced network technologies. However, this significant reform measure could not be implemented due to TRAI's aggressive valuation for 30 years by simply extrapolating **the valuation of 20 year by multiplying it with 1.5 without accounting for time value of money.**

43. Subsequent to this discussion during last auction, there have been global developments around extending the tenure of spectrum for 5G and upcoming 6G technologies to 40 years and beyond on same terms to provide business continuity, stability and regulatory predictability. Ofcom (UK) has auctioned 5G spectrum in 700 MHz and 3.4 GHz spectrum for minimum 20 years[3], extendable indefinitely on annual license fee for continued use of spectrum. Spain has extended the validity to 40 years

[3] https://www.ofcom.org.uk/siteassets/resources/documents/manage-your-licence/mobile-wireless-and-broadband/cellular/licences/sa-700-licence-telefonica-1248094.pdf?v=326639

and many other countries like Austria, Denmark, Greece, Romania, Chile and Uruguay are actively considering the same.

44. Evidently, there are ample global experiences where the regulators or spectrum administrators are enabling the service providers in developing new use cases and technological dividend for public by providing a spectrum assurance and there is no reason why the same cannot be replicated in India.

45. The Authority can continue with the valuation methodologies for 20-year assignment and then extrapolate the same to a 40 years term with a factor of 1.2 times (taking into account time value of money at 8%) so that the Government and Exchequer interest is also protected. Further, the successful bidders can be provided with following 2 options.

    a. The successful bidder can opt for a 20-year tenure. In this case the successful bidder can either opt to make upfront payment or opt for deferred payment option as per NIA 2024, wherein the payment will be split into 20 equated annual installments. Further, the successful bidder will have a right to extend the spectrum tenure for 40 years by opting to pay same annual payment for next 20 years.

    b. The successful bidder can opt for a 40-year tenure with 1.2 times market value of the spectrum. In this case the successful bidder can either opt to make upfront payment or opt for deferred payment option as per NIA 2024, wherein the payment will be split into 40 equated annual installments.

46. Under the existing framework, due to the spectrum surrender guidelines, the effective binding commitment has already been reduced to 10 years, with an option to continue usage up to 20 years. Hence, the practical commitment period stands at 10 years though the auction evaluation happens for 20-year cost, providing flexibility thereafter.

47. Another option to operationalize a 40-year assignment period can be as below:

    a. **Base the valuation on the annualized auction-discovered price.**

    b. Permit annualized payments linked to actual usage, with a minimum payment commitment of 10 years, aligned with the existing surrender framework.

    c. Define the maximum assignment period as 40 years, allowing early surrender at the licensee's discretion.

d. Allow discounting of early or upfront payments at a uniform rate of 8% per annum.

e. To ensure only serious participation and protect the minimum commitment of 10 years, require a rolling Bank Guarantee (BG) equivalent to at least three instalments, maintained until completion of the first ten instalments.

48. We submit that adoption of either of the above options would ensure that there is **no financial loss to the Government**. On the contrary, it would **secure a stable and predictable long-term revenue stream** for the exchequer while minimizing the risk of spectrum remaining **unassigned or underutilized** due to short tenure-related constraints.

49. From the industry perspective, extending the spectrum tenure would provide **greater regulatory certainty and investment predictability** to Telecom Service Providers (TSPs). It would enable operators to formulate **long-term network and technology roadmaps**, including deployment of future-generation technologies, without the concern of premature expiry following the "dead-holding" period. This would, in turn, promote efficient spectrum utilization, encourage sustained capital investment, and enhance the overall stability of the telecom sector.

G. Allocation of backhaul Spectrum

50. We respectfully submit that, in view of the **rapidly increasing demand for high capacity backhaul** to support 5G and forthcoming 6G networks, and in alignment with the objectives of the **draft National Telecom Policy (NTP) 2025** and associated national digital transformation goals, it is imperative that **adequate and harmonized backhaul spectrum** be made available to telecom service providers. The availability of sufficient backhaul capacity is fundamental to ensuring the seamless delivery of high-speed broadband and to realizing India's vision of a digitally empowered society and knowledge economy.

51. In this context, we urge the Authority to recommend the **auction of backhaul spectrum**, particularly the bands assigned on exclusive basis, to facilitate the telecom industry's ability to manage the exponentially growing data traffic and support the transition to advanced network architectures, including **5G-Advanced and 6G**. Further, spectrum in the **E-Band (71–76 GHz / 81–86 GHz)** and **V-Band (57–71 GHz)** holds critical importance in this regard. These bands are especially suited for **Integrated Access and Backhaul (IAB)** and **wireless-to-the-home** (FWA) deployments, offering high throughput and low latency. Timely allocation of these

bands for Access/backhaul use through a transparent and market-based mechanism will significantly enhance network efficiency, lower costs, and enable rapid coverage expansion.

H. Eligibility Conditions

52. **Eligibility Conditions**: We submit that there is no need to re-agitate the eligibility conditions for participating in auction. As per Telecommunication Act 2023, establishing, working, and maintaining Telegraph can only be done under an appropriate authorization issued by the Government. Further, there are no entry barriers for any entity to opt for access services authorization. Accordingly, **any applicant seeking to acquire spectrum for establishing public/private network should do so only under access services authorization.** Evidently, the current eligibility conditions under NIA suffice the requirements.

53. **Summary:**

1. **All internationally identified spectrum should be put to auction in forthcoming auction. There is no need to hold back spectrum from auction to increase demand.**
2. **Complete 1200 MHz of spectrum in 6 GHz i.e. from 5.925–7.125 GHz should be put to auction immediately, with delayed payment starting from actual availability timeframe of 2030.**
3. **The spectrum tenure, roll-out obligations, and payment schedule shall commence from the date of actual assignment of the complete quantum of spectrum won in the auction.**
4. **This approach will ensure regulatory consistency, equitable treatment of bidders, and alignment between financial liability and spectrum availability, thereby promoting efficient planning and long-term investment certainty for bidders.**
5. **Spectrum valuation should be rationalized post considering the spectrum availability and its relative value in scheme of things.**
6. **Auction determined price should continue to be key metric for valuation of already auctioned spectrum bands.**
7. **There should be no reduction in spectrum valuation for all bands successfully auctioned in auction immediately preceding the proposed auction.**
8. **Since 600 MHz band is the only available sub-1GHz band that can provide large chunk of spectrum suitable for 6G, its valuation should be at least 2 times the ADP of spectrum in 700 MHz band.**

9. The valuation of 6 GHz band should be at 20% of the ADP of spectrum in 3300 MHz band.
10. The reserve price should be kept at 50% of spectrum valuation.
11. The spectrum tenure should be increased to 40 years. Successful bidders should have option to avail the 40-year tenure or opt for 20-year tenure with a right to extend the same.
12. The valuation for 40-year tenure should be at 1.2 times the valuation for 20 years to protect Annualized payment of spectrum for extended period.
13. The TSPs opting for 20-year term should have the option for extending the assignment for further 20 years on same installment terms.
14. The deferred payment option in NIA 2024 should be extended under both options.
15. The Backhaul question should be addressed by auctioning this spectrum along with leveraging Integrated Access Backhaul use case of V-band and E-band. Additionally, spectrum in L-Band and S-Band should also be auctioned.
16. The spectrum cap should be removed, if required block wise spectrum cap of 40% to 50% should be applicable.
17. There is no need to re-visit the eligibility conditions for participation in auction.
18. Current roll-out obligations are sufficient with exiting provision of rollout obligation being treated as fulfilled for all bands on meeting the same by use of any technology in any band by a licensee.
19. All spectrum, including the new bands, should be made available to the TSPs in a technology neutral manner and TSPs should be allowed to use any technology/standards as per their requirements.

Issue wise response:

Q1. What measures should be taken to enhance competition and mitigate over-supply of the spectrum in various frequency bands in the forthcoming auction? Please provide a detailed response with justifications.

RJIL Response

1. We submit the concerns over potential "over-supply" of spectrum and limited competition are misplaced. Given rapid technological evolution, frequent auctions, and a liberalized regime, spectrum assignment should not be viewed narrowly in economic terms. Auctions remain the most transparent, equitable, and non-

discriminatory method of allocating this national resource, ensuring fairness even when demand is low or prices align with reserve levels.

2. The spectrum is not in oversupply and there is sufficient competition in the market. Oversupply is an economic term relating to under-selling in auctions that cannot be applied verbatim to auction of a natural resource like spectrum that is critical for meeting national goals and is crucial for public welfare.

3. When the Government's stated policy objective is not revenue maximization, the success of a spectrum auction should not be measured by the quantum of revenue raised or the percentage sold above reserve price. Instead, success must be defined by:
    a. Absence of post-auction disputes;
    b. Equal opportunity to all eligible participants—new or existing; and
    c. Efficient utilization of spectrum for expanding digital connectivity.

4. We submit that the simplistic conclusions drawn from measuring the spectrum put to auction vs. spectrum sold are not appropriate in this case as various critical factors behind such outcomes are ignored. The less spectrum uptake can be an outcome of any or multiple of the following factors as detailed below:

    a. Certain band not being in plan for deployment immediately like 700 MHz band for a while and 600 MHz band in previous auction due to pending standardisation by 3GPP.

    b. A major spectrum investment cycle just being concluded, which is logically followed by network investments leaving little scope for spectrum augmentation, for instance the impact of massive buying in 2022 5G auction followed by a subdued auction in 2024.

    c. Unavailability of contiguous spectrum like 800 MHz in 2013, 2300 MHz and 3300 MHz bands in 2024 auction.

    d. Uncertainty about getting contiguity of new spectrum with previous spectrum holdings, more particularly in 3300 MHz band

    e. The device eco-system unavailability at a particular time.

    f. Another band being relatively more important at the moment for the bidder's plans like 1800 MHz and 2300 MHz band for a long time

5. We submit that more pragmatic approach to spectrum supply than simple mathematical deductions is to juxtapose the spectrum supply with the national goals, consumption patterns, key statistics that need to be changed and then analyze whether we need to auction the spectrum or not.

6. Our national goals vis-à-vis telecom can be summarized to primarily connect all Indians to digital connectivity and achieve the proliferation goals under **NDCP-2018, NTP-2025, Viksit Bharat and Digital India programs where all citizens and all levels of Governance are connected and to provide a digital backbone to the country to enable all sectors of the Economy. Another aspirational goal is to co-lead the 6G developments and deployments.**

7. However, the key national statistics indicate that we are still far from achieving the basic connectivity goals leave alone the aspirational goals. Over **20% of telecom users are not broadband users and rural teledensity is still less than 60%, indicating that a large part of the population is still not connected to broadband highways.** Furthermore, many of the key drivers of data consumption like digital learning, remote working and skill development, video streaming in HD and 4K; availability of Cloud based services; AR/VR applications and AI-powered apps and IoT devices are yet to percolate down to all citizens.

8. Despite of this, as per Business wire India's mobile data market is expected to grow from **INR 726.10 billion in 2024** to **INR 2.21 trillion by 2030**, with a **CAGR of 22.39%. All these statistics show us that all the available spectrum and more would be required for broadband needs of the citizens and the concerns like oversupply or under selling in an auction are completely irrelevant and out of place.**

   The Regulator and Government's responsibility is to make available all the possible quantities of natural resources like spectrum so that these can be put to best use for the betterment of the actual owners of these resources i.e. people of India. **Any artificial scarcity by limiting supply would be contrary to both economic logic and the national interest.**

9. **The restriction of supply will be akin to spectrum hoarding to drive the prices up, which would risk India to fall behind in newer technologies deployments and the same should be avoided at all costs.**

Q2. Whether the entire available spectrum in the existing bands viz. 800 MHz, 900 MHz, 1800 MHz, 2100 MHz, 2300 MHz, 2500 MHz, 3300 MHz, and 26 GHz band should be put to auction in the forthcoming auction?

(a) If yes, what measures should be taken to ensure effective competition in the forthcoming auction?
(b) If no, what quantum of spectrum in each of the frequency bands should be put to auction in the forthcoming auction?
Kindly provide a detailed response with justifications.

RJIL Response

Yes, we submit that from a policy predictability perspective all identified and available spectrum should be put to auction in the proposed annual auctions, as has been done in all the past auctions conducted till date.

Q3. Whether the band plans, which have been adopted for the existing bands viz. the 800 MHz, 900 MHz, 1800 MHz, 2100 MHz, 2300 MHz, 2500 MHz, 3300 MHz, and 26 GHz bands in India, should be retained in the forthcoming auction? If no, kindly suggest new band plan(s) for the existing bands with detailed justifications.
And
Q5. Whether the block size and minimum quantity for bidding in the existing bands viz. 800 MHz, 900 MHz, 1800 MHz, 2100 MHz, 2300 MHz, 2500 MHz, 3300 MHz, and 26 GHz bands should be kept the same in the forthcoming auction as those in the spectrum auction of June 2024 as mentioned in Table No. 2.14 of this consultation paper? If not, what should be the band-wise block size and minimum bid quantity? Kindly provide a detailed response with justifications.

RJIL Response

There is no need to change band plans, which have been adopted for the existing bands viz. the 800 MHz, 900 MHz, 1800 MHz, 2100 MHz, 2300 MHz, 2500 MHz, 3300 MHz, and 26 GHz bands in India as we have operational networks in these bands and no need has been felt to alter the same. Further, barring 3300 MHz and 26 GHz, these bands have been in operation for over 10-15 years and there is no need to change the band-wise block size and minimum bid quantity.

Q4. Whether the spectrum in the existing bands viz. 800 MHz, 900MHz, 1800 MHz, 2100 MHz, 2300 MHz, 2500 MHz, 3300 MHz, and 26 GHz bands should be auctioned on Telecom Circle/ Metro Area basis with a validity period of 20 years in the forthcoming auction? If no, what should be the area, and validity period of spectrum assignment in the existing bands? Please provide detailed response with justifications.

RJIL Response

1. As mentioned in the Preface, the increase in the tenure of auctioned spectrum from 20 years to 30 years was one of the key telecom sector reforms approved by the Union Cabinet in September 2021. This reform was intended to enhance long-term policy stability, certainty of resource assignment, improve business viability, and facilitate sustained investment in advanced network technologies. **It must be borne in mind that this was one of the key measures to infuse liquidity and encourage investment in the sector, therefore, it should have been implemented in 2022 auction itself.**

2. However, as discussed above the Authority was caught up in linearly correlating the spectrum valuation with the spectrum tenure, as is evident from the discussion in consultation and recommendations prior to the 2022 auction. We submit that the extension of the spectrum tenure should be strictly viewed from the perspective of long-term sustainability of the TSPs and predictability of regulatory regime to enable massive spectrum and network investments and not be extrapolated linearly from spectrum valuation for 20 years.

3. Even in practical terms, linear extrapolation does not make any sense in a fast-changing technological landscape, where a technology like 3G becomes obsolete in 5 years and the prime spectrum band had to be redeployed somewhat inefficient redeployment within the initial 10 years of the 20-year tenure. Clearly, this is a game of diminishing returns and real benefit to the TSPs will only be predictability to enhance long term planning and not economic. Thus, the spectrum valuation for 20 years cannot be linearly extrapolated by a multiplier of 2 for a 40-year assignment.

4. We reiterate that subsequent to this discussion during last auction, globally the momentum is shifting towards extending the tenure of spectrum for 5G and upcoming 6G technologies to 40 years and beyond on same terms to provide business continuity, stability and regulatory predictability. Ofcom (UK) has auctioned 5G spectrum in 700MHz and 3.4GHz spectrum for minimum 20 years, extendable indefinitely on annual license fee for continued use of spectrum. Spain has extended the validity to 40 years and many other countries like Austria, Denmark, Greece, Romania, Chile and Uruguay are actively considering the same.

5. Evidently, there are ample global experiences where the regulators or spectrum administrators are enabling the service providers in developing new use cases and deliver technological dividend for public by providing a spectrum assurance and there is no reason why the same cannot be replicated in India.

6. The Authority can continue with the valuation methodologies for 20-year assignment and then extrapolate the same to a 40-year term with a factor of 1.2 times the valuation for 20 years (taking into account time value of money at 8%) so to protect annualized payment of spectrum for the extended period. Further, the successful bidders can be provided with 2 options.

    a. The successful bidder can opt for a 20-year tenure. In this case the successful bidder can either opt to make upfront payment or opt for deferred payment option as per NIA 2024, wherein the payment will be split into 20 equated annual installments. Further, the successful bidder will have a right to extend the spectrum tenure for 40 years by opting to pay same annual payment for next 20 years.

    b. The successful bidder can opt for a 40-year tenure with 1.2 times market value of the spectrum. In this case the successful bidder can either opt to make upfront payment or opt for deferred payment option as per NIA 2024, wherein the payment will be split into 40 equated annual installments.

7. Under the existing framework, due to the spectrum surrender guidelines, the effective binding commitment has already been reduced to 10 years, with an option to continue usage up to 20 years. Hence, the practical commitment period stands at 10 years through the auction evaluation happens for 20-year cost, providing flexibility thereafter.

8. In this context, another approach to operationalize a 40-year assignment period can be as below:

    a. Base the valuation on the annualized auction-discovered price.

    b. Permit annualized payments linked to actual usage, with a minimum payment commitment of 10 years, aligned with the existing surrender framework.

    c. Define the maximum assignment period as 40 years, allowing early surrender at the licensee's discretion.

    d. Allow discounting of early or upfront payments at a uniform rate of 8% per annum.

e. To ensure only serious participation and protect the minimum commitment of 10 years, require a rolling Bank Guarantee (BG) equivalent to at least three instalments, maintained until completion of the first ten instalments.

9. We submit that adoption of either of the above options would ensure that there is no financial loss to the Government. On the contrary, it would secure a stable and predictable long-term revenue stream for the exchequer while minimizing the risk of spectrum remaining unassigned or underutilized due to short tenure-related constraints.

10. From the industry perspective, extending the spectrum tenure would provide **greater regulatory certainty and investment predictability** to Telecom Service Providers (TSPs). It would enable operators to formulate **long-term network and technology roadmaps**, including deployment of future-generation technologies, without the concern of premature expiry following the "dead-holding" period. This would, in turn, promote efficient spectrum utilization, encourage sustained capital investment, and enhance the overall stability of the telecom sector.

11. Anyhow, the extended tenure would not imply higher bidding capacity with the TSPs at the current juncture. Thus, the extended tenure does not necessarily mean that spectrum will retain same value for next 20 years. **Thus, as mentioned before, the spectrum tenue extension should not amount to linear increase in valuation of spectrum. Any escalation of spectrum valuation on this ground will be tantamount to negating the Cabinet reforms at implementation level.**

Q6. What should be the eligibility criteria and associated eligibility conditions for participation in the forthcoming auction for the existing bands viz. the 800 MHz, 900 MHz, 1800 MHz, 2100 MHz, 2300 MHz, 2500 MHz, 3300 MHz, and 26 GHz bands? Kindly provide a detailed response with justifications.

RJIL Response

1. We submit that the eligibility criteria as defied in the NIA 2024 gives sufficient flexibility to all service providers desirous of offering communication services to Indian customers and should remain unaltered even with inclusion of new bands.

2. The Authority's desire to increase competition for spectrum auction is evident from the consultation paper. However, we submit that currently there are no entry barriers for availing access service authorization under the Telecom Act 2023 and the applicants desirous of obtaining spectrum in the Auction should not be wary of taking a suitable authorization to utilize the same.

3. Allowing entities with lower entry-fee authorizations to join spectrum auctions will not enhance competition or sectoral growth. Since entry fees are negligible compared to spectrum costs, they do not pose a real entry barrier. Any entity can participate by committing to obtaining the required authorization. Hence, differentiating licensees by entry fee or authorization type serves no purpose and may create regulatory uncertainty and disputes.

4. Another issue with allowing non-access service entities like proposed Digital Connectivity Infrastructure Provider (DCIP) authorisation holders or Cloud hosted Telecommunication Network (CTN) authorization holders, as discussed in the consultation paper, would lead to fragmentation of spectrum due to possible demands for sub-LSA level spectrum and excessive load of roll-out obligations on these service providers, as there cannot be a separate set of roll-out obligations for these service providers under an auction.

5. The existing spectrum auction framework is robust, transparent, and flexible, ensuring open participation and fair competition among all eligible entities. It sufficiently safeguards the twin objectives of efficient spectrum use and non-discriminatory access. Hence, no further alteration or introduction of special categories of licensees is warranted.

Q7. Whether there is a need for modifying roll-out obligations for the existing bands viz. 800 MHz, 900 MHz, 1800 MHz, 2100 MHz, 2300 MHz, 2500 MHz, 3300 MHz and 26 GHz bands, as stipulated in the Notice Inviting Application (NIA) for the spectrum auction held in June 2024 in order to improve mobile coverage in the country? If yes, what modifications should be made in the roll-out obligations for the existing bands? Kindly provide a detailed response with justifications.

RJIL Response

1. We submit that the current policy on roll-out obligations has evolved based on ground realities and has been successful in delivering desired results and should be persisted with.

2. As per the prevailing conditions under the Notice Inviting Applications (NIA), the roll-out obligation shall be deemed to have been fulfilled once the requisite number of district headquarters, block headquarters, or rural Short Distance Charging Areas (SDCAs) are covered by a licensee through the use of any technology in any spectrum band. This flexible, technology-neutral approach has ensured effective network expansion while allowing service providers the

operational freedom to determine the most efficient deployment strategy. In view of this, the existing roll-out framework sufficiently meets the policy objectives for all currently assigned spectrum bands. Any modification to these obligations is unwarranted and may create uncertainty without delivering additional public benefit.

3. Accordingly, **we recommend no change in the current roll-out obligations for spectrum in 800 MHz, 900 MHz, 1800 MHz, 2100 MHz, 2300 MHz, 2500 MHz, 3300 MHz and 26 GHz bands**.

Q8. Whether there is a need to review the spectrum caps for the existing bands viz. 800 MHz, 900 MHz, 1800 MHz, 2100 MHz, 2300 MHz, 2500 MHz, 3300 MHz and 26 GHz bands for the forthcoming auction? If yes, what should be the spectrum cap per service provider for different frequency bands? Kindly provide a detailed response with justifications.
And
Q18. What provisions with respect to the spectrum cap per service provider in a licensed service area (LSA) should be made applicable for the spectrum in the upper 6 GHz band for IMT? Specifically, -
(a) Whether a combined spectrum cap for the 3300 MHz band and the upper 6 GHz band should be prescribed? If yes, what should be the spectrum cap per service provider?
(b) In case your response to (a) above is in the negative, what should be the spectrum cap per service provider for the spectrum in the upper 6 GHz band? Please provide a detailed response with justifications.

RJIL Response

1. We submit that RJIL firmly believes that the spectrum caps are artificial hindrances in coverage and capacity expansion, which might have been relevant in the days of spectrum scarcity, but have lost their relevance since then. Spectrum caps were originally introduced to promote competition and prevent monopolization when spectrum was scarce, and the market was nascent. Today, with abundant spectrum, mature markets, and evolved technologies, those concerns no longer apply. Natural market forces, network economics, and competition law now provide sufficient safeguards. Hence, spectrum caps have outlived their relevance and should be phased out, allowing TSPs to consolidate contiguous holdings for efficient use and to support high-capacity 5G-Advanced and 6G networks. Artificial caps only create fragmentation, inefficiency, and unnecessary costs without consumer benefit.

2. **We submit that apprehensions of monopolization of spectrum bands are misplaced in Indian context, when a large amount of spectrum has remained unsold in recent auctions.**

3. Therefore, RJIL reiterates its submissions that the spectrum caps should be completely abolished. Without prejudice to the above, if spectrum caps are retained, they should be applied only to bands with similar technical and propagation characteristics. Arbitrary aggregation of dissimilar bands distorts competition and undermines the policy intent of fairness. Accordingly, we propose the following rationalized grouping and cap structure:

    a. **Sub 1-GHz FDD bands:** This group shall include 600 MHz, 700 MHz, 800 MHz and 900 MHz bands. The spectrum cap for this group may be fixed at 40% of the total spectrum available in these bands within each Licensed Service Area (LSA).

    b. **Mid-Band FDD bands:** This group shall include 1800 MHz and 2100 MHz bands. The spectrum cap for this group may be fixed at 40% of the total spectrum available in these bands within each Licensed Service Area (LSA).

    c. **Mid-Band TDD bands:** This group shall include 2300 MHz, 2500 MHz, 3300 MHz and 6 GHz bands. The spectrum cap for this group may be fixed at 50% of the total spectrum available in these bands within each Licensed Service Area (LSA).

    d. **High-Band TDD bands:** This group shall include 26 GHz, 37-37.5 GHz, 37.5-40 GHz, and 42.5-43.5 GHz bands. The cap for this group may be fixed at 50% of the total spectrum available in these bands within each Licensed Service Area (LSA).

4. The above grouping structure ensures that caps, if at all retained, are technology-neutral and propagation-consistent while allowing operators sufficient operational flexibility to aggregate spectrum efficiently for next-generation network deployment

5. Notwithstanding the above submissions, we would urge the Authority to look beyond the avoidable concerns like monopolization of spectrum resources, which are relevant only in the spectrum scarcity scenarios and **focus on the optimum deployment and in deriving strategic dividend and efficiencies that**

can be delivered through wider channel sizes in uni or dual spectrum band networks.

Q9. Are there any other inputs/ issues related to the auction of spectrum in the existing bands viz. 800 MHz, 900 MHz, 1800 MHz, 2100 MHz, 2300 MHz, 2500 MHz, 3300 MHz and 26 GHz bands for the forthcoming auction? Suggestions may be made with detailed justifications.

RJIL Response

1. We submit that as major portions of these spectrum bands are already assigned, the remaining spectrum is available only in small fragments that too away, from the existing assignments of the service providers and for this spectrum to be gainfully deployed there is a need to ensure the spectrum contiguity. While in past, in many cases, inter-operator arrangements have been successful in ensuring contiguous spectrum blocks for all users, however, this may not always be feasible like in case of 3300 MHz band. Therefore, the Authority should address the issue of contiguity in this band.

2. We further submit that since spectrum assigned through auction is assigned at market-determined prices, such spectrum should continue to be permitted for deployment across diverse use cases in a technology-neutral manner — including Access, Backhaul, Integrated Access Backhaul (IAB), and other permissible applications. The use of such spectrum shall not be restricted or limited on account of the exclusion of certain use cases from the auction mandate as prescribed under Schedule I of the Telecommunication Act, 2023. Furthermore, with the emergence of Non-Terrestrial Networks (NTN), the successful bidder should also be permitted to utilise the assigned spectrum for NTN operations.

Q10. Whether the spectrum in the 600 MHz band should be put to auction in the forthcoming auction? If yes, whether the band plan n105 should be adopted for the 600 MHz band, or otherwise? Please provide a detailed response with justifications.
And
Q11. In case you are of the opinion that the 600 MHz band should not be put to auction in the forthcoming auction, what should be the timelines for auctioning of the 600 MHz band? Please provide a detailed response with justifications.

RJIL Response

1. We reiterate our submissions that **all spectrum that can be put to use in public or private communication networks should be auctioned and spectrum in the 600 MHz band is no exception.** Therefore, this band should be auctioned along with other IMT bands in the forthcoming auction of spectrum.

2. The Authority is aware that there are working networks in this band globally and there should not be any apprehension in deploying this key sub-1-GHz spectrum in the country. As highlighted in our comments in the preface the spectrum in sub-1-GHz is the ether of telecommunication services.

3. The sub-1-GHz bands are the key coverage bands due to their high coverage potential, which increases exponentially as we go down the ladder so 600 MHz will be the most valuable of sub 1 GHz bands, not only for its coverage potential but also by virtue of the fact that this is the only unused sub 1-GHz band with sufficient spectrum availability i.e. 2X40 MHz. In fact, this alone makes it invaluable. Further, the earlier limitations of non-availability of 3GPP standards in this band are no longer relevant with completion of standardization of this band in 3GPP in year 2022.

4. We submit that the TRAI should adopt 3GPP Band n105 as the harmonized band plan for the 600 MHz spectrum in India as per the following specifications.

3GPP 38.101: Table 5.2-1: NR operating bands in FR1			
NR operating band	**Uplink (UL)** ***operating band***	**Downlink (DL)** ***operating band***	**Duplex Mode**
	BS receive / UE transmit	**BS transmit / UE receive**	
	F_{UL_low} – F_{UL_high}	**F_{DL_low} – F_{DL_high}**	
n105	663 MHz – 703 MHz	612 MHz – 652 MHz	FDD

5. The Authority has already indicated the massive global interest in adoption of the 3GPP n105 band (erstwhile APT 600 MHz band) post 3GPP standardization in October 2022, which is also in line with Indian position in 2022, and there is no need for repeating the same here.

6. Evidently, this interest will be replicated into rapid device eco-system development across the globe. Further, the developments indicated by the GSA report referred by the Authority should remove any remnants of doubt in auctioning this spectrum.

7. **Furthermore, while device ecosystem may be a concern now but once a major country like India successfully auctions this spectrum, then it will be a massive**

thrust to ongoing ecosystem development. Thus, a successful auction of this spectrum would be akin to a positive signal for ecosystem development.

8. It may also be taken into consideration that the chipset ecosystem in n105 band is ready. Inclusion of APT600 MHz in the 3GPP NR channel list has simplified integration for handset manufacturers, fixed wireless access (FWA) providers, and IoT device makers due to readily available support in chipsets. Major chipset vendors like Qualcomm have already incorporated n105 support across their product lines, including RFICs for smartphones, customer-premises equipment (CPE), and FWA platforms. This was showcased during IMC-2024, where commercial devices demonstrated seamless operation on n105. As telecom operators procure this band, original device manufacturers (ODMs) and original equipment manufacturers (OEMs) are expected to enable n105 support across their new devices, including budget-friendly models.

9. We reiterate that the device support for newer bands is very closely related to regulatory clarity. Unambiguous and clear regulatory decision by India will further motivate the device vendors to start offering the band within the cost-sensitive markets like ours. This will mirror the successful rollout of Band n78 and n28 in India post-2022 auction, where ODMs quickly adapted to market needs. These bands n78, n28 among others followed a similar playbook, they were already supported in the chipset, and device makers rapidly enabled these bands to cater to market trends. The support for n105 is expected to follow a similar trend, with a robust and ready support in chipset, and devices to closely follow market trends based on business considerations in cost sensitive markets like India.

Q12. In case it is decided to auction the spectrum in the 600 MHz band in the forthcoming auction, -
(a) Should the entire available spectrum in the 600 MHz band be put for bidding in the forthcoming auction?
(b) Whether the eligibility criteria, associated eligibility conditions, block size, minimum bid quantity of spectrum, validity period for the assignment of spectrum, area of assignment on Telecom Circle/ Metro Area-basis, spectrum cap and roll out obligations for the spectrum in the 600 MHz band in the forthcoming auction should be kept the same as those in the spectrum auction of 2022, or otherwise?
Please provide a detailed response with justifications.
And
Q13. Are there any other inputs/ issues related to the auction of spectrum in the 600 MHz band for the forthcoming auction? Suggestions may be made with detailed justifications.

RJIL Response

1. As mentioned in the previous response there should be no doubt about putting to auction the spectrum in 600 MHz band. **We submit that this band has great potential for improving the coverage of wireless broadband and would play a very significant role in covering remote and rural areas.**

2. This spectrum will massively buttress the coverage capacities for current 4G/5G and future 6G networks. Considering that 5G and 6G networks will require spectrum to not just support eMBB but also uRLLC and mMTC services, and also **in the coverage layer; additional sub-1-GHz band i.e. 600 MHz spectrum will be vital.** The coverage band requirements will increase from current 2X20 MHz per operator to at least 2X30 MHz per operator and this 2X40 MHz spectrum will be invaluable in meeting the same.

3. Further as 700 MHz, 800 MHz and 900MHz bands have already been exhausted in most LSAs, the new 600 MHz band will be the prime candidate to meet new coverage requirements. **Additionally, in order to achieve the objective of harmonised frequency arrangement and optimum utilization of this spectrum, it is also important to ensure that there are no other services/ authorizations given for this band utilization on either co-primary or secondary basis.**

4. Furthermore, as far as the eligibility criteria, associated eligibility conditions, block size, minimum bid quantity of spectrum, validity period for the assignment of spectrum, area of assignment on Telecom Circle/ Metro Area-basis, spectrum cap and roll out obligations for the spectrum in the 600 MHz band are concerned, these should be as per other sub-1-GHz bands. Accordingly, these should be kept the same as those in the spectrum auction of 2022.

5. We further submit that since spectrum assigned through auction is assigned at market-determined prices, such spectrum should continue to be permitted for deployment across diverse use cases in a technology-neutral manner — including Access, Backhaul, Integrated Access Backhaul (IAB), and other permissible applications. The use of such spectrum shall not be restricted or limited on account of the exclusion of certain use cases from the auction mandate as prescribed under Schedule I of the Telecommunication Act, 2023. Furthermore, with the emergence of Non-Terrestrial Networks (NTN), the successful bidder should also be permitted to utilise the assigned spectrum for NTN operations.

Q14. Whether the spectrum in 6425-6725 MHz and 7025-7125 MHz ranges in the upper 6 GHz band should be put to auction for IMT in the forthcoming auction? Kindly provide a detailed response with justifications.
And
Q15. In case you are of the opinion that the spectrum in 6425-6725 MHz and 7025-7125 MHz ranges should not be put to auction in the forthcoming auction, what should be the timelines for auctioning of this spectrum for IMT? Kindly provide a detailed response with justifications.

RJIL Response

1. We submit that the spectrum in 6 GHz band is a critical part of the 5G/6G mid-band spectrum configurations. To realize its vision of global 6G leadership, India must ensure timely and adequate allocation of harmonized, contiguous spectrum. This will drive indigenous innovation, research, and early deployment of world-class networks.

2. Leading studies by Ericsson and Nokia indicate that 6G will require about 750 MHz of mid-band spectrum per operator, roughly 3 GHz in total for wide-area IMT use. Nokia notes that, beyond the current ~1 GHz available for IMT, an additional 500–750 MHz per network is essential. Ericsson emphasizes that advanced 6G use cases like holographic communication, immersive metaverse, and digital twins demand at least 3 GHz of contiguous mid-band spectrum to ensure seamless mobility and capacity.

3. The Authority should allocate the entire 1200 MHz of the 6 GHz band (5925–7125 MHz) for IMT and other licensed use. As the 6 GHz band is the anchor for 5G and 6G, full allocation and auction of this band is essential to ensure efficient utilization and India's readiness for next-generation connectivity.

4. However, unfortunately out of the 1200 MHz spectrum in the 6 GHz frequency band, only 400 MHz spectrum in two fragmented chunks at 6425-6725 MHz (300 MHz) and 7025-7125 MHz (100 MHz) is immediately available for auction and the remaining 300 MHz in frequency range 6725-7025 MHz will be available by December 2030. Out of this, 500 MHz in frequency range 5925-6425 MHz is being considered for delicensing. Given India's limited mid-band spectrum, dividing the band by delicensing the lower 500 MHz would permanently constrain future use and risk interference.

5. Another concerning factor is that the device and network equipment ecosystem for 6 GHz in India and globally is currently developing and availability of devices and

supporting network equipment is expected only in 2030. Thus, this spectrum would not be deployable in next 5 years and effective deployment will start only in 2030.

6. However, considering the importance of this spectrum in achieving national goals and network efficiencies, it is important that the investments in this band should start in right earnest at the earliest. Therefore, we believe that the entire spectrum in the band 5925-7125 MHz should be put to auction now in order to push device eco-system development.

7. There is no need to mention that mobile networks are the primary mode of internet access in India. As a result, India has one of the highest mobile data usage globally (24 GB/month/sub) and more than 945 million wireless broadband subscribers. Considering the high population density of India (481/sq km), lower penetration of fixed line broadband and resultant extensive use of mobile data, particularly driven by mobile wireless networks such as 4G/5G in India, the current spectrum availability of a mere 370 MHz in mid band (i.e. 3300-3670 MHz) is inadequate. This scarcity of mid-band spectrum would significantly fall short in meeting the spectrum requirements of the TSPs.

8. Further, the international assessments including that by GSMA[4] indicate that for a ubiquitous 5G and 6G coverage a minimum of 2 GHz bandwidth of mid-band spectrum would be required to support the growth of 5G in the 2025-2030 time frame.

9. Considering heavy reliance on mobile networks in India and the TSPs commitment to ensure highest Quality of Service (QoS) in 5G networks along with ubiquitous coverage, the operators in India would require multiple times the quantities assigned in comparison to other countries. This is crucial for India to strive towards becoming the number 1 broadband service provider globally. Hence, though GSMA study indicated minimum availability of 2 GHz of bandwidth in mid-band, keeping in mind the population density and data requirements of Indian population, the spectrum requirement will far exceed the minimum of 2 GHz bandwidth requirement. It is to be noted that currently, India has earmarked only 18% of quantum requirements as indicated by the GSMA study.

10. As 6 GHz band is the only mid-band spectrum available for IMT services, which offers a contiguous bandwidth for the TSPs, we request TRAI to recommend auction of complete 6 GHz band i.e. 5925-7125 MHz band for licensed service in a technology neutral manner . Further, additional mid-band spectrum in remaining parts of the C-band should also be made available for IMT/5G use.

[4] https://www.gsma.com/connectivity-for-good/spectrum/5g-spectrum-guide-2/

11. The International examples of delicensing the 6 GHz band in dense-fiber penetration countries such as USA, Canada, Brazil, Chile, South Korea, Mexico and Saudi Arabia etc. are not relevant to Indian ecosystem which is primarily served by wireless networks.

12. **Further, in order to avoid unnecessary and impossible burden on the successful bidders and to enable them to develop this band, the financial and roll-out obligations in this band should kick in only when the entire spectrum band is available in 2030. This will also enable the service providers to decide on 5G or 6G deployment of this spectrum.**

13. To summarize, we submit that entire 6 GHz spectrum band should be auctioned in one go including the parts that will be available only in 2030. The spectrum should be assigned to the successful bidders so that they can start working on the other aspects of the network development on an initial payment of 5% of successful bid amount. All other obligations viz. deferred payment liabilities, roll out obligations, spectrum term and rest should start from 2030, when the entire band will become available.

Q16. Considering that the satellite-based service (uplink) will coexist with IMT-based services in the upper 6 GHz band, whether pilot trials should be conducted to ascertain the keep-out distance of the IMT base stations for satellite uplink stations before the auction of the upper 6 GHz band,
or
should it be left to the telecom service providers to ascertain the keep-out distance of the IMT base stations for satellite uplink stations at the time of commercial deployment after the auction? Kindly provide a detailed response with justifications.

RJIL Response

1. We agree that the co-existence of satellite-based service (uplink) with IMT-based services in the upper 6 GHz band is a matter of discussion and analysis. However, considering the fact that there is sufficient time in deployment of this spectrum for IMT, it would be suitable to conduct a pilot trial to determine the keep-out distance of IMT base stations from satellite uplink stations prior to auctioning the Upper 6 GHz band. This will help in objective assessment of the coexistence requirement between IMT and satellite services.

2. We further submit that conducting regulator-led trials before the auction is in line with international best practices. For example, CEPT, FCC, and ACMA have all relied on coexistence studies before finalizing technical rules for 6 GHz.

3. Operators may later refine deployment through additional site-specific coordination, but a minimum protection regime must be defined in advance to ensure both IMT growth and satellite service integrity.

Q17. In case it is decided to put the spectrum in 6425-6725 MHz and 7025-7125 MHz ranges in the forthcoming auction, -

(a) Whether the 3GPP band plan n104 should be adopted for the upper 6 GHz band? If no, which band plan should be adopted for the upper 6 GHz band?

RJIL Response

We reiterate that the **entire 6 GHz band (5.925–7.125 GHz)** should be earmarked and auctioned in a technology neutral manner for IMT/6G and any other technology-based deployment, ensuring India's readiness for next-generation connectivity.

(b) What amount of spectrum in the 6425-6725 MHz and 7025-7125 MHz ranges should be put to auction?

RJIL Response

1. We submit that the entire 1200 MHz in the 6 GHz band (5.925–7.125 GHz) be included in the upcoming auction to ensure transparency and investment certainty. While only 400 MHz is immediately available, the remaining 800 MHz will be freed as satellite usage vacates. Auctioning the entire 1200 MHz even if major portions of it are made available in phases will enable operators to plan long-term investments in 6G networks and infrastructure with clarity on future spectrum availability.

2. The Payment obligations, roll-out conditions, and spectrum tenure should begin only after the complete and contiguous spectrum is assigned, ensuring alignment between financial commitments and availability. To encourage serious participation, the Authority may consider requiring the successful bidder to deposit ~5% of the auction price upfront, serving as a firm commitment of intent while simultaneously this deposit could be utilized to fund the migration of existing satellite users to alternate frequency bands before 2030, if not before 2028. This balanced approach promotes

transparency, fiscal prudence, and investment certainty while advancing India's 6G readiness.

(c) Whether the spectrum in the 6425-6725 MHz and 7025-7125 MHz ranges should be auctioned on Telecom Circle/Metro service area basis with a validity period of 20 years? If no, what should be the area and validity period of spectrum assignment in the 6425-6725 MHz and 7025-7125 MHz ranges?

RJIL Response

Yes, this is a regular mid-band IMT spectrum and should be auctioned on Telecom Circle/Metro service area basis. However, as submitted before, the successful bidder should have the option to for spectrum validity between 20 years or 40 years.

(d) What should be the block size, minimum bid quantity, and roll-out obligations for the spectrum in these ranges?

RJIL Response

1. We submit that the block size of 10 MHz in line with the block size in 3300 MHz band will be suitable for this band as well. Further, considering this a new band, the minimum bid quantity should be 50 MHz.

2. The roll-out obligations should be analogous to those for new entrants in 3300 MHz band and as per existing practices the operators who have completed roll-out in 3300 MHz band should not be required to fulfill any additional roll-out obligations.

3. Further, it is important to ensure that roll-out obligations in 6 GHz band be applied only after the entire band or at least 300 MHz of contiguous spectrum is assigned. Imposing deployment requirements on a fragmented or partially available band would be technically inefficient and economically unviable. The roll-out schedule must align with full band availability and harmonization to ensure efficient, future-ready deployment.

4. For bands being auctioned for the first time, roll-out obligations, if imposed, should be proportionate and aligned with:
    a. Device ecosystem readiness,
    b. Technology maturity and deployment feasibility, and
    c. Global and national band plans.

5. Any overly stringent requirements for nascent bands could hinder planning, raise costs, and deter investment. Further, USOF's statutory responsibilities should not be shifted to licensees through such obligations.

(e) What should be the eligibility criteria and associated eligibility conditions for bidding for the spectrum in these ranges?
Please provide a detailed response with justifications.

RJIL Response

The eligibility conditions should remain same for all access bands and only access service providers should be allowed to bid for this access spectrum.

Q19. To mitigate inter-operator interference due to TDD-based configuration, whether the approach adopted for the 3300 MHz and 26 GHz bands should also be made applicable for the newly identified spectrum in the upper 6 GHz band? In case you are of the opinion that some other provisions are required to be established, suggestions may kindly be made with detailed justifications.

RJIL Response

1. We agree with the Authority's approach that to mitigate TDD inter-operator interference, India should follow the same harmonisation principle used for 3300 MHz and 26 GHz i.e. assign identical frequency ranges across all circles to national winners where possible.

2. Further, since spectrum is assigned on LSA basis, cross border interference issues could still be there if the overlapping frequency spots have been assigned to different TSPs in neighboring LSAs. This can also be avoided if a TSP is assigned same frequency spots across different LSAs, to the extent possible. Further interference mitigation be left to the mutual coordination between the TSPs.

3. It is suggested that spectrum harmonization of 3500 band (n78) be carried out on the same lines -currently there is overlap among cross border operators which is a major challenge for TDD interference mitigation.

4. Further, as **submitted previously, permitting the rank holder to choose the frequency spot would be an optimum solution, which has already been tried and tested solution in previous auctions. Under this arrangement in case a TSP is rank 1 holder in majority of LSAs then it should be allocated the preferred frequency spot in all LSAs. We also suggest that this process may**

be adopted for all the bands although will require auction process software upgradation.

5. In addition to providing a harmonized spectrum allocation, it will also ensure enhanced competition in auction wherever a particular frequency range is found more useful within the 6 GHz band due to lesser interference risk or better eco-system availability.

6. In addition to above, to mitigate interference issues of the TDD band more effectively, we submit that all regulation for TDD bands should be similar to the ones prevailing under LTE Band 40 for instance GPS 1 PPS Synchronization and Use of Identical DL:UL Ratio across the operators, which is to be prescribed as part of auction conditions.

Q20. Are there any other inputs/ issues related to the auction of spectrum in the upper 6 GHz band for the forthcoming auction? Suggestions may be made with detailed justifications.

RJIL Response:

1. Globally, it is well acknowledged that **6 GHz band (5925 – 7125 MHz) is the 'golden band' for 6G**, as it provides optimum combination of Coverage as well as Capacity, which cannot be matched by any other band. It is the **only band now left with the Government, which can offer contiguous bandwidth of 300 MHz each** for 4 operators to help them to provide globally competitive 6G services.

2. However, there are 2 different ways by which this band is being considered worldwide. In the U.S. and parts of Europe, the lower 6 GHz (5.925 – 6.425 GHz) has been delicensed for Wi-Fi use, while China has taken a lead by finalising its entire 6G spectrum band (5.925 – 7.125 GHz) for 6G.

3. It is relevant to note that the **need for mobile spectrum in India is far greater than that of China**, primarily due to 2 reasons:

    a. **Exceptionally High population density**: India's population density of approximately 481 persons per sq. km is over three times that of China (150) and nearly twelve times that of the United States (40). Consequently, Indian networks face a unique "demand density" challenge, where a single cell site must serve exponentially more users. This makes large, contiguous spectrum blocks indispensable for maintaining service quality and network economics.

    b. **Low Fixed broadband penetration:** India's fixed broadband penetration stands at only ~15 households per 100, compared with ~95 in China, ~93 in the United States, and ~97 in South Korea. China is expected to reach 600

million fiber-connected homes by 2030. India, by contrast, remains heavily dependent on wireless connectivity to deliver broadband access under the Digital India mission. Hence, the spectrum allocated for mobile broadband must compensate for this fixed-line deficit.

4. While determining the spectrum quantum for 5G and 6G, the above specified India's specific demographic and infrastructural characteristics must be duly considered. Thus, it is imperative that we reserve this entire 6 GHz band (5925 - 7125 MHz) for licensed use and start auctioning this band without any further delay.

5. We further submit that since spectrum assigned through auction is assigned at market-determined prices, such spectrum should continue to be permitted for deployment across diverse use cases in a technology-neutral manner — including Access, Backhaul, Integrated Access Backhaul (IAB), and other permissible applications. The use of such spectrum shall not be restricted or limited on account of the exclusion of certain use cases from the auction mandate as prescribed under Schedule I of the Telecommunication Act, 2023. Furthermore, with the emergence of Non-Terrestrial Networks (NTN), the successful bidder should also be permitted to utilise the assigned spectrum for NTN operations.

6. In view of the above, we reiterate that this spectrum band should be auctioned in a technology neutral manner so that the successful bidders can deploy the spectrum with any approved technology like GSM/WCDMA/LTE/CDMA/IMT-2020 (5G technology)/IMT-2030 (6G technology)/any technology based on standards approved by ITU/TEC or any other International Standards Organization/ bodies like 3GPP, IEEE etc. In case the technology happens to be other than above, then on opting for such technology, prior intimation to DoT should be given.

Q21. Considering the need to assign a contiguous 24 MHz block in the 1427-1518 MHz range to the Government user,
(a) Which band plan and duplexing scheme should be adopted for IMT in the 1427-1518 MHz range?
(b) Which range of spectrum (a contiguous block of 24 MHz) should be assigned to the Government user? Kindly provide a detailed response with justifications.
And
Q22. Are there any other inputs/ issues related to the spectrum in the 1427-1518 MHz range? Suggestions may be made with detailed justifications.

RJIL Response

We take this opportunity to bring to the Authority's attention that as per the evolving consumption patterns, App behaviour and growing usage demand, more

than supplementary downlink, there will be a need for supplementary uplink band. Thus, the Authority should hold back on designating 1427–1518 MHz as Supplementary downlink for Government user now and instead re-evaluate the suitability of this band once the 5G networks are mature and 6G networks on the rise, basis consumption patterns and market requirements.

Q23. Whether there is a need to review the spectrum auction method and design followed in India? If yes, suggestions on spectrum auction method and design may be made with detailed justifications and international practice in this regard.

RJIL Response

1. We do not believe that there is a need to review the spectrum auction method and submit that the Simultaneous Multiple Round Auction (SMRA) is an optimum auction format that helps discover true market value with multiple rounds of bidding with systematic price escalations. This model provides flexibility for the bidders and leads to efficient allocation of resources. This is a successful and most preferable model of spectrum auction in India and should be persisted with.

2. It is further reiterated that the reason for less than optimum sale in one or two auctions should be seen from the right perspective and should not lead to doubts on basic premises. The SMRA auction has been a successful auction model and should not be tampered with just because some other countries are using other models. Furthermore, while the desire for increase in competition is well appreciated, it will not happen by changing auction designs in a 3-operator auction.

3. Therefore, we reiterate that there should be no change in auction design and SMRA should be continued with.

Q24. What additional economic, technical, or market-related factors should be taken into account while determining the valuation and, subsequently, the reserve price of spectrum, in order to promote effective competition, ensure optimal spectrum utilization, and encourage wider participation in auctions?

RJIL Response

1. There are many relevant economic, technical, or market-related factors that should be taken into account while determining the valuation and, subsequently, the reserve price of spectrum. We have attempted to summarize these factors in following paras.

2. **Objectives of the auction:** The key Government objectives under a spectrum auction, over the years, has been to obtain a market determined price of Spectrum through a transparent process; Ensure efficient use of spectrum and avoid hoarding; Stimulate competition in the sector; Promote rollout of the respective services; and To arrive at optimal price of spectrum to ensure sustainable and affordable access to Digital Communications. Essentially the idea is to get a market price of spectrum through a **transparent, non-discriminatory process while allowing operators to use it optimally and efficiently. The only hindrances to achieving these objectives will be to not getting the reserve price right and not auctioning all available spectrum. The Authority should avoid these possible pitfalls.**

3. **Protection of Past Auction Valuations:** We submit that innovative spectrum reforms and intensive spectrum requirements under 5G and beyond technologies and concerns regarding less uptake of spectrum in auction should not lead to reduction in reserve price for existing bands, even for the LSAs and band where spectrum was sold in the preceding auction. Such reductions have no logical or reasonable justification and in fact will lead to significant erosion of the value of the spectrum for the buyers who bought the spectrum in preceding auction. This concern becomes more apparent in era when the auctions are planned to be held every year. We submit that such unreasonable practices have serious impact on investor confidence as drastic reduction in prices, for bands that have already been sold in previous auction, creates investors' uncertainty leading to a possibility of muted response in next auction, anticipating speculative gains in subsequent auction next year. This will also have adverse impact on fund raising capability of TSPs.

4. Accordingly, we submit that the Authority should recommend inclusion of a provision in the NIA for the price guarantees in subsequent auctions based on auction determined price in current auction and during the life of the spectrum, which is duly protected for the NPV value, for the LSA that has been successfully sold in the last auction. In worst case price should not be reduced for at least 3 years. In case the price is reduced then the benefit of the reduction should be made available to the existing buyers.

5. **International Benchmarking:** We submit that for new spectrum bands being put to auction, international benchmarking whenever an auction determined price is available globally would be a critical **measure, as this is derived from actual marketability assessments across the band. Thus, along with the spectral**

efficiency analysis by the Authority, this factor should also be taken into consideration and give due weightage in spectrum valuation.

6. **Intrinsic value and replaceability factor:** Some spectrum bands and their cohorts with similar propagation characteristics are already in short supply with clear view of unavailability of any similar new bands in future. These spectrum bands have much higher intrinsic value and low replaceability factor boosting their valuation, a prime example being Sub-1-GHz bands. On the other hand, the spectrum in higher frequency bands is inter-changeable without any significant efficiency loss and keeps getting supplemented by identification of new capacity bands for IMT, thus the relative value of a single spectrum band is not that high. This is another factor to be considered.

7. **Network Costs:** Another important criterion is the projected cost of laying a network. We submit that as we go up in the frequency chart, the coverage area reduces considerably thereby leading to a larger spend on network infrastructure and Opex to maintain this infrastructure. **As per our understanding, 3.5 GHz band needed 40% more sites than 1800 MHz to have a similar coverage. On the other hand, the sub-1-GHz bands need considerably lesser outlay. All these facts should be juxtaposed with the modern 5G and beyond networks' requirement to support Massive MIMO Radio Units (MRU) which is approximately 4 times than 1800 MHz band RU. Due to high power consumption of MRU, it increases SMPS and battery back-up capacity. In addition, further capex will be added to power infrastructure and real estate space. Therefore, Capex and Opex for 3.5 GHz has increased by at least 5 times compared to 1.8 GHz band.**

8. **Relevant technical factors:** Further, in addition to the poorer coverage of higher frequency bands like 6 GHz, there is another factor which determines technical efficiency of the band. This is the TDD Self Interference due to Tropospheric Ducting effect. **In 2300 MHz band, there is a loss of approximately 20% of capacity on over 70% of the TDD cells, which is likely to increase in case of 6 GHz band thus requiring more Capex for similar level of coverage. This is an important factor that should be borne in mind while deriving technical efficiency of TDD bands.** The impact of all these factors will continue compounding as we go up the frequency chart.

9. **Revenue Potential of spectrum:** There is always an inverse relationship between the coverage objectives and ARPUs. **Thus, while we go for the final millions to be connected to broadband, the pricing needs to be just right for them to come onboard without entry barriers. This implies that there is minimal**

pricing elasticity available with TSPs on addition of new spectrum and the cost of the spectrum needs to be somewhat absorbed in existing pricing. Thus, the addition of new capacity bandwidths will not allow massive increase in ARPUs/tariffs due to the low paying capacity and disposable income. While on the other hand the coverage bands have the potential of adding new customers to the networks giving a bump to revenues and higher ARPUs later on when they start consuming more data going forward. Therefore, it is reasonable to conclude that the revenue potential of new capacity bands will not be enormous and therefore pricing should be accordingly appropriate.

10. **Impact of proliferation on national economy**: The NDCP-2018 notes that ***"It has been broadly estimated that a 10% increase in broadband penetration in a country could potentially lead to an over 1% increase in GDP. However, studies in India estimate that the impact could be significantly higher for the country, given the increased productivity and efficiency gains that are likely to accrue to the economy"***. Thus, policy makers need to keep the overall economic benefits of broadband penetration in mind, while carrying out the pricing exercise for spectrum. We request the Authority to rationalize the spectrum valuation with a focus to put maximum spectrum in use.

Q25. Should the valuation of a given spectrum band, among 800 MHz, 900 MHz, 1800 MHz, 2100 MHz, 2500 MHz, 3300 MHz, and 26 GHz, be based exclusively on its respective auction-determined price from the 2022 and/or 2024 auctions, without applying any other valuation approach? In such a case, should the auction price be indexed using MCLR or any other basis (please specify) to account for the time gap? Please provide detailed justification.

And

Q26. If the answer to the above is in the negative, should the past auction-determined price of the respective spectrum band still be considered as one of the approaches or basis for valuation, along with other approaches? Please provide justification for your response. In such a case, should the auction price be indexed using MCLR or any other basis (please specify) to account for the time gap? Please provide detailed justification.

RJIL Response

1. We submit that auction discovered price (ADP) is a relevant and important factor in a subsequent valuation exercise of already auctioned and sold spectrum bands, and we do not see any reason to change the same. However, this should not be the only factor to be considered.

2. **Another key factor to be considered is the replaceability of a spectrum band under the current and upcoming technologies. This will be a key metric for right valuation of the spectrum.** For instance, spectrum in TDD mid-bands i.e. 2300 MHz, 2500 MHz, 3300 MHz and 6 GHz can be substitute for one another in current 4G and 5G technologies, while their role in 6G is still evolving and nothing can be said with certainty till the standards are completely frozen by 2030.

3. On the other hand, the valuation of the sub-1-GHz bands is an entirely different exercise owing to the irreplaceable coverage role played by these bands and paucity of this spectrum and many Government departments constantly eyeing a free piece of this pie like Railways and BSNL getting spectrum in 700 MHz.

4. Furthermore, with around 2X 60 MHz availability in existing bands (excluding 600 MHz band) the availability is abysmally low, which would have direct impact on the valuation of 600 MHz band. Thus, the valuation pressure on this band would be very high.

5. Another key factor for consideration is the unsold spectrum in an auction, as this also acts as an important guiding point on whether the valuation was wrong at certain places. However, the valuation of a spectrum that was sold in an auction should not be reduced in the next auction as this will jeopardize the sunk investments by a service provider who bought the spectrum.

6. **Evidently, only the past auction prices are not a relevant consideration for spectrum valuation. There are multiple factors that need to taken into consideration, which include the relative importance of the spectrum in current and future technologies, device eco system development stage among others.**

7. Consequently, we submit that for new spectrum band and even for considering the auction determined prices for spectrum bands auctioned and sold earlier, for years priors to the auction, the Authority should also take into consideration all other relevant factors. For instance, the spectrum availability at that time of auction and consequent competitive intensity, association with license renewal etc. would be very relevant factors for using the valuation of spectrum in prior auctions.

8. Further, while it has been TRAI's policy to consider indexation if the valuation exercise is being done post 1 year of last auction, the indexation should not become a tool to make spectrum unviable and thereby undeployable. We must always bear in mind that spectrum is a resource owned by the people of India and

should not become unavailable just because of inflexibility in policy. **As mentioned above, replaceability, intrinsic nature of the spectrum and relative demand should be key factors in using indexation and in cases of low demand the indexation can be dropped also.**

Q27. Should the spectrum valuation exercise be undertaken once every three years, as recommended by the Authority in its recommendations dated 11.04.2022? If not, what should be the revised periodicity for conducting the valuation exercise? Please justify your response along with detailed basis for conducting a fresh valuation exercise.

And

Q28. Should the valuation models as adopted by the Authority in its last recommendation, continue to be used as a basis for valuation of spectrum in the 800 MHz, 900 MHz, 1800 MHz, 2100 MHz, 2300 MHz, 2500 MHz, 3300 MHz, and 26 GHz bands? Please provide a detailed justification.

And

Q29. Is there a need to introduce any changes to the valuation models or methodologies currently followed by the Authority for spectrum valuation exercises, including the discontinuation of any existing model or the introduction of a new model? If yes, please provide specific suggestions along with a detailed justification.

RJIL Response

1. We submit once all available spectrum is put to auction and we have market determined price for all spectrum, then extensive annual valuation exercise may not remain relevant. However, the Authority may require re-evaluating the spectrum valuation in view of unsold spectrum in auction, technological changes, change in international benchmarks on spectrum valuation, new technologies and new spectrum bands being recognized as IMT bands and so on so forth.

2. Thus, while the regular valuation exercise with a 3 years interval is a good idea and there is no harm in persisting with the same, there will always be a need for revisiting the valuation for minor upgrades and tweaks considering all the factors discussed above at the time of auction.

3. Thus, the annual spectrum auctions will definitely require an annual re-look at valuation by the Authority, however, the extensiveness and comprehensiveness of this exercise can be curtailed by deciding certain fixed parameters to address the issue of completely unsold bands or to reiterate the valuation.

4. **The valuation methodologies used by the Authority are an eclectic mix of hard coded methods like auction discovered price (ADP), technical approaches like spectral efficiency analysis and international benchmarking, so at present these approaches seem sufficient. However, the Authority should remain open to emergence of new valuation techniques and include the same in the mix as soon as these are available. Further, the contours of the DoT spectrum report referred to in the CP should also be carefully examined and imbibed for improvement in current methodologies, wherever applicable.**

5. Other factors that can be introduced are the cost of building terrestrial networks with higher frequency bands, revenue growth potential and national proliferation goals, among others. The Authority should bear in mind that as we go for higher frequency, the coverage reduces and cost of installing network goes up considerably, thus to laden such spectrum with unrealistically high reserve price would invariably keep the newer technologies and faster data networks out of reach for consumers.

Q30. Should the auction determined price of other bands by using spectral efficiency factor serve as a basis of valuation for the 800 MHz, 900 MHz, 1800 MHz, 2100 MHz, 2300 MHz, 2500 MHz, 3300 MHz and 26 GHz bands? If yes, which spectrum bands be related, what efficiency factor or formula should be used and what is the basis for the same? Please justify your suggestions.
And
Q31. Apart from the approaches highlighted above which other valuation approaches should be adopted for the valuation of spectrum in existing bands? Please provide detailed information along with justifications.

RJIL Response

All these bands have been auctioned multiple times and have their own existing valuations and are themselves benchmarks for spectral efficiency factor so we do not think that there is any need for using auction determined price of other bands by using spectral efficiency factor serve as a basis of valuation for the 800 MHz, 900 MHz, 1800 MHz, 2100 MHz, 2300 MHz, 2500 MHz, 3300 MHz and 26 GHz bands.

Q32. Should the auction determined price of other bands by using spectral efficiency factor serve as a basis of valuation for 6425–6725 MHz and 7025–7125 MHz bands? If yes, which spectrum bands be related, what efficiency factor or formula should be used and what is the basis for the same? Please justify your suggestions.
And

Q33. Should the auction determined price of other countries in 6 GHz spectrum bands serve as a basis of valuation of 6425- 6725 MHz & 7025-7125 MHz bands in India? What methodology should be followed for using this auction determined price as a basis for valuation? Support your suggestions with justifications and country-wise auction data.

And

Q34. If the above approach is considered appropriate, should the international auction-determined prices be normalized to account for cross-country differences such as population, GDP, purchasing power parity (PPP), subscriber base, and other relevant factors? If so, should normalization be carried out by using the ratio of auction prices of 6 GHz spectrum bands vs other mid band/mmWave band within the same country to neutralize the impact of cross-country differences? Alternatively, please suggest any other suitable normalization methodology that may be adopted in this context.

And

Q35. Apart from the approaches highlighted above, which other valuation approaches may be adopted for the valuation of 6425- 6725 MHz & 7025-7125 MHz bands? Please provide detailed information along with justifications.

RJIL Response

1. We submit that from the perspective of spectral efficiency and propagation characteristics the spectrum closest the 6 GHz band is the 3300 MHz band. The 3300 MHz band was auctioned just in 2022 and has a relatively new ADP. Further, as per our understanding the 6GHz band would cover around 20% area covered by the 3300 MHz band, as explained in following section.

   Comparison of the cell radius and coverage area of 3500 MHz band vs 6500 MHz frequency band.

   Factors considered :

- **Propagation model: 3GPP Urban Macro (UMa) model is used for the analysis which is providing 5.4dB of additional loss in 6.5GHz.**
- Penetration loss: 3dB additional loss in 6.5GHz
  - 3500MHz: 24 dB
  - 6500MHz: 27 dB
- Uplink Throughput: 6 dB of delta in Maximum Allowable Path Loss (MAPL) is expected for cell edge

- .

As per link budget, the cell radius reduction is coming out to be ~58%, while area reduction is ~83%.

Scenarios	Unit	Dense Urban	Urban	Sub Urban	Rural
Cell Radius as per 6500Mhz_2Mbps UL	m	116	157	312	538
Cell Radius as per 3500Mhz_512Kbps UL	m	276	372	738	1275
% Reduction in cell Radius	%	58.0%	57.8%	57.7%	57.8%
Area Covered by single (3 sector) site_6500MHz	Sq km	0.024	0.048	0.190	0.564
Area Covered by single (3 sector) site_3500MHz	Sq km	0.148	0.270	1.061	3.168
% reduction in Site Area	**%**	**83.5%**	**82.2%**	**82.1%**	**82.2%**

2. Thus, by the Authority's methodology in 2022 recommendations, a technical efficiency factor of 0.2 should be applied on the ADP of spectrum in 3300 MHz band to derive the valuation of 6 GHz band. Thus, the valuation of 6 GHz band should be half of the ADP of 3300 MHz band.

3. The auction determined price of 6 GHz in Hong Kong at HK$ 2.1 million per MHz is at approximately 75% of India's 3300 MHz ADP. Further the international benchmarking has to take into consideration the population and geography to be covered and earning potential and relative ARPUs. Thus, considering all these factors and above calculations, we submit that valuation at 20% of 3300 MHz band ADP is the optimum valuation for spectrum in 6 GHz band.

Q36. Should the auction determined price of other bands by using spectral efficiency factor serve as a basis of valuation for 600 MHz bands? If yes, which spectrum bands be related, what efficiency factor or formula should be used and what is the basis for the same? Please justify your suggestions.

RJIL Response

1. Yes, the optimum measure for this spectrum will be the auction discovered price of spectrum 700 MHz band. The spectrum in this band will be more efficient than the spectrum in 700 MHz band owing to much lower frequency, as explained in following section.

Comparison of the cell radius and coverage area of 600 MHz band vs 700 MHz frequency band.

Factors considered

- **Propagation model: 3GPP Urban Macro (UMa) model is used for the analysis which is providing 1.2dB of lower loss in 600MHz.**
- Penetration loss: slightly lower in 600 MHz (0.4dB)
    - 700MHz: 18 dB
    - 600MHz: 18-0.4=17.6 dB
- Uplink Throughput: 0dB of delta in Maximum Allowable Path Loss (MAPL) is expected for cell edge

As per link budget, the cell radius increases by ~10.3%, while area increased is ~21.6%.

Scenarios	Unit	Dense Urban	Urban	Sub Urban	Rural
Cell Radius as per 600MHz_512kbps UL	m	830	1149	2321	4036
Cell Radius as per 700MHz_512kbps UL	m	754	1042	2105	3660
% Increase in cell Radius	%	10.1%	10.3%	10.3%	10.3%
Area Covered by single (3 sector) site_600MHz	Sq km	1.342	2.572	10.497	31.741
Area Covered by single (3 sector) site_700MHz	Sq km	1.108	2.116	8.634	26.102
% Increase in Site Area	**%**	**21.2%**	**21.6%**	**21.6%**	**21.6%**

2. Further, owing to the ample availability, this spectrum will have the potential of being a coverage layer band for a new 6G network, playing the critical role in ensuring broad, reliable coverage, particularly in rural and remote areas.

3. This spectrum will also be useful due to its excellent propagation qualities and will be useful in enhanced indoor coverage and owing to its range it will be very useful for remote connectivity and will be an anchor band for a world full of sensors.

4. We reiterate our position that the **auction discovered prices are the most relevant and important factor in a subsequent valuation exercise of already auctioned and sold spectrum bands as well as new spectrum band with comparable propagation characteristics, and we do not see any reason to change the same.**

5. Furthermore, past auction prices become more relevant consideration for new spectrum band when there are no other suitable valuation metrics. The opportunity cost of **600 MHz band, which is the only and last available sub-1GHz band that can provide large chunk of spectrum suitable for 6G,should**

also be factored in. Hence the valuation of this band should be 2 times the ADP of spectrum in 700 MHz band. It is submitted that this is the minimum multiplier factor required for this band.

Q37. Should the auction determined price of other countries in 600 MHz band serve as a basis of valuation of 600 MHz band in India? What methodology should be followed for using this auction determined price as a basis for valuation? Support your suggestions with justifications and country-wise auction data.
And
Q38. If the above approach is considered appropriate, should the international auction-determined prices be normalized to account for cross-country differences such as population, GDP, purchasing power parity (PPP), subscriber base, and other relevant factors? If so, should normalization be carried out by using the ratio of auction prices of 600MHz band vs other sub GHz spectrum bands within the same country to neutralize the impact of cross-country differences? Alternatively, please suggest any other suitable normalization methodology that may be adopted in this context.

RJIL Response

1. As per the data shared by TRAI, the Auction determined price per MHz per pop in USA is US$ 0.9387 for 600 MHz, which is much higher than the 700 MHz cost in India, which at the population of 1.4 billion comes to around $ 0.3161 per MHz per pop, which is approximately one third of the US spectrum cost.

2. However, the international auction determined prices have to be seen in perspective of the earning potential of the spectrum in a country and considering much larger population to be covered in India with much lower ARPU, the normalization factor would only lead to the price suggested in previous response i.e. twice the ADP of spectrum in 700 MHz band in India.

Q39. Apart from the approaches highlighted above which other valuation approaches may be adopted for the valuation of 600 MHz band? Please provide detailed information.

RJIL Response

We submitted that as the two most compelling valuation approaches are leading to a similar valuation, all other approximations can be dropped in this case.

Q40. Should the value of 800 MHz, 900 MHz, 1800 MHz, 2100 MHz, 2300 MHz, 2500 MHz, 3300 MHz, 26 GHz, 6425- 6725 MHz & 7025-7125 MHz and 600 MHz bands be determined using a single valuation approach? If yes, please indicate which single valuation approach or method should be adopted in each case and provide detailed justification.

And

Q41. In case your response to the above question is negative, will it be appropriate to take the average valuation (simple mean) of the valuations obtained through the different approaches attempted for valuation of the above spectrum bands, or some other approach like taking weighted mean etc. should be followed? Please support your answer with detailed justification.

RJIL Response

1. We submit that valuation exercise cannot be a 'one size fits all' kind of exercise for all spectrum bands. Each valuation technique should be evaluated at merit with each spectrum band. Thus, while the ADP might be most suitable option for bands that have been already auctioned multiple times like 800 MHz, 1800 MHz, 2100 MHz, 2300 MHz, 2500 MHz etc. International benchmarking with reasonable indexation can be a suitable approach for new bands to be auctioned. Further, even in new bands to be auctioned there can be variances with respect to intrinsic value of spectrum due to technical efficiency based on propagation characteristics of the band.

2. Thus, we submit that it is not necessary to examine all valuation techniques to all spectrum bands and if the Regulator feels even single valuation approach for a particular spectrum band can be taken as the appropriate value of that band as long as it gives the optimum result.

3. Average valuation of multiple valuation methodologies can be too simplistic an approach, if the valuations are widely disparate and/or one methodology appears to be apt from all aspects. In such a scenario, this method should be avoided.

Q42. What ratio should be adopted between the reserve price for the auction and the valuation of the spectrum in 800 MHz, 900 MHz, 1800 MHz, 2100 MHz, 2300 MHz, 2500 MHz, 3300 MHz, 26 GHz, 6425- 6725 MHz & 7025-7125 MHz and 600 MHz bands and why? Please support your answer with detailed justification.

RJIL Response

1. We submit that in view of reduction in number of effective bidders in past few auctions, reduced auction activity, lack of new entrants in sector for a while, reserve price formula of 70% of valuation of spectrum is no longer relevant.

2. We submit that in view of the requirement of discovering efficient price of spectrum, the reserve price should be decided in such a manner that there is greater participation in auction. **However, the same is possible only when reserve price is not kept at artificially high levels that act as barrier and discourages TSPs from participating in the auction. There are past instances of reduction in reserve price leading to greater participation in spectrum auction.**

3. It is pertinent to point out that reduction in reserve price does not necessarily lead to loss to the Exchequer. **We understand that even if there is some reduction in final winning price as compared to previous auction, the rediscovered price will be reflective of current market price of that particular spectrum band and Government will receive license fee from that particular spectrum, which may have remained unsold and unused due to unreasonable reserve price.** There will also be the wider benefit from utilization of scarce natural resource. We reiterate that optimum value of spectrum is derived from its usage rather than from the one time auction revenues.

4. Consequently, **we submit that the reserve price formula needs to be revisited, and the reserve price should be kept at 50% of the valuation of the spectrum.** This will enable free play of competitive market forces and help discover the real market value of spectrum. No need to add that we do not agree to proposal of keeping last discovered auction price as reserve price in next auction.

Q43. What should the payment terms and associated conditions for the assignment of 800 MHz, 900 MHz, 1800 MHz, 2100 MHz, 2300 MHz, 2500 MHz, 3300 MHz, 26 GHz bands, 6425- 6725 MHz & 7025-7125 MHz bands and 600 MHz bands relating to:
(i) Upfront payment
(ii) Moratorium period
(iii) Total number of instalments to recover deferred payment
(iv) Applicable interest rate for protecting the NPV of bid amount
Please support your answer with detailed justification.

RJIL Response

1. We submit that the payment terms for 600 MHz, 800 MHz, 900 MHz, 1800 MHz, 2100 MHz, 2300 MHz, 2500 MHz, 3300 MHz, 26 GHz bands should be on same

lines as in NIA 2024, with the changes suggested with regards to spectrum tenure. The spectrum tenure and payment schedule shall commence from the date of actual assignment of the complete quantum of spectrum won in the auction. Additionally, there is a need to align the interest rate in option 2 with current Repo Rate of RBI i.e. at 5.5%.

Option 1: Full or part upfront payment of the bid amount within 10 calendar days from the issuance of Demand Note by DoT. Where part upfront payment has been made, which can be a multiple of complete years with a minimum of two years, the buyer shall have the option of availing moratorium for the corresponding number of years for which the upfront payment has been made, and the balance amount shall be payable in equal annual instalments over the remaining period, payable in advance at the beginning of each year, after the period of moratorium if any, duly protecting the Net Present Value (NPV) of the bid amount at the applicable rate of interest. The annual instalments shall become due and payable on the Effective Date anniversary of each following year.

Option 2: Payment of 20 (or 40, as per the option exercised by the successful bidder) equal annual instalments of the bid amount, duly protecting the NPV of the bid amount at the applicable rate of interest, in advance at the beginning of the year, the first instalment becoming payable within 10 calendar days from the issuance of Demand Note by DoT. The balance 19 (or 39, as per the option exercised by the successful bidder) instalments shall become due and payable on the Effective Date anniversary of each following year. In case of 40 year tenure the bid price will be increased by a factor of 1.2 to protect the NPV.

The applicable interest rate for protecting the NPV of the bid amount is 5.50%.

2. Successful Bidders shall deposit the Successful Bid Amount i.e., full amount or part upfront payment amount or first instalment in case of deferred payment option within ten (10) calendar days from the issuance of Demand Notice by DoT. In case of the due date of payment is a Saturday, Sunday or a public holiday, the due date for payment will be considered as the next working day.

For partially available spectrum band of 6 GHz, which will be fully available in 2030, following payment terms are suggested.

3. Successful Bidders shall deposit 5% of the Successful Bid Amount within ten (10) calendar days from the issuance of Demand Notice by DoT to secure the assignment of the spectrum in 2030. In case the due date of payment is a Saturday, Sunday or a public holiday, the due date for payment will be considered

as the next working day. Operators shall make a 5% down payment at the time of auction.

4. The remaining 95% shall be accrued and payable from the date of assignment or 2030, whichever occurs earlier. The successful bidder shall be given the opportunity to avail deferred payment option in 2030 as well as full upfront payment option.

Q44. Any other suggestion relevant to the subject may be submitted with detailed justification.

RJIL Response:

1. **Parity between Communication OTTs and TSPs**

   OTT communication services are treated at par with TSP communication services by the customers and these service providers as well. These have customer base at par with TSPs and are leveraging the lack of regulatory and financial obligations to cannibalize the TSP revenue. COAI has already submitted a request to bring these unregulated services that rely on mobile numbers as identifiers for their users, under regulatory regime. To **ensure regulatory parity and accountability, OTT communication services should be brought under the UL framework for the services rendered. This approach would not only maintain consistency in regulatory treatment but also ensure proper oversight of services that utilize public numbering resources to offer communication services, regardless of their technological implementation. This is also imperative to control the spam and fraud that is spreading more rapidly through OTT channels.**

2. **Waiver of license fee for fixed Broadband services**

   The Government recognizes the importance of fixed line services in meeting the objectives of Digital India and the National Broadband Mission. TRAI has recommended thrice for waiver of license fee on fixed line broadband revenue and DoT has also approved this, but final approval is not forthcoming. The revenue of the wireline license fee is less than 5% of telecom revenue and this waiver can rejuvenate the sector without much financial impact. Waiver of license fee on wireline broadband is a critical measure to achieve affordable fixed-line broadband services, and this approved decision should be implemented. We request the Authority to reiterate its recommendations.

3. **Suspend Digital Bharat Nidhi (DBN) contribution from TSP and bring LTG under its framework**

   Large Over the Top (OTT) Players like Google, Meta, Netflix, Amazon, etc. are Large Traffic Generators (LTGs) and the main beneficiary of the digital connectivity provided in the country. These OTT players use the TSP network for providing advertising and various content-based services to their subscribers. The LTGs account for nearly 70% of the network traffic (3,500 crores GB per month). They increase the load on the TSP's networks by their service models without any contribution towards development and maintenance of such networks. As the OTT players are the key beneficiaries of the broadband expansions. Therefore, they must contribute towards the objectives of DBN. This contribution may, however, be limited to only large OTT players like Google, Meta, Netflix, Amazon, etc. and the Government may impose 10% of their Indian revenue as contribution to DBN.

4. **Rationalization of taxes and levies**

   The Current taxes and levies regime is excessive with over 30% of revenue being used for servicing taxes and levies. This has an unhealthy outcome of insufficient surplus cash with TSPs for reinvestment in sector. We seek

   i. Abolish USO/DBN levy
   ii. Reduction of License Fee from 3% to less than 1% of AGR
   iii. Reduction in GST from 18% to 5%
   iv. Exemption of Government Payments from GST
   v. Review of exclusion list for AGR

5. **Bring the Indian norms at par with ICNIRP norms**

   The Governments has reduced the emf radiation limits in India from 1/10th of ICNIRP to half of ICNIRP limits, however, the requirements for 5G and beyond technologies and the quantum of spectrum required for these services, irrevocably establishes that India cannot keep a path separate from the world. Especially when we want to compete on technology leadership. There is a need to bring the EMF limits at par with ICNIRP norms, and the Authority should also recommend the same.

6. **Net Neutrality related issues**

With the stabilizing of our 5G SA services across country, we are receiving proposals to launch tariff products based on network slicing technology under 5G SA. The sample proposals are for products for a defined upload speed slice and low latency gaming slice etc. Globally, Net Neutrality is evolving with market and technology scenarios. FCC had repealed Net Neutrality rules basis market dynamics and Ofcom has concluded that new dimensions to NN can be added in the form of permitting premium quality retail offers; (b) new 'specialised services'; (c) traffic management; (d) Most zero-rating offers. The TRAI should adopt a flexible approach to recognize traffic management, technology centric innovations like network slicing in 5G; specialised and managed services on same physical broadband medium.

7. **Auction of Backhaul spectrum**

To meet the growing backhaul demand for 5G and upcoming 6G networks and to align with the draft National Telecom Policy (NTP) 2025 and national digital goals, adequate and harmonized backhaul spectrum must be ensured for TSPs. Sufficient backhaul capacity is essential for seamless broadband delivery and and to realizing India's vision of a digitally empowered society and knowledge economy.

In this context, we urge the Authority to recommend the auction of backhaul spectrum, particularly the bands assigned on exclusive basis, to facilitate the telecom industry's ability to manage the exponentially growing data traffic and support the transition to advanced network architectures, including 5G-Advanced and 6G. Further, spectrum in the **E-Band (71–76 GHz / 81–86 GHz) and V-Band (57–71 GHz)** holds critical importance in this regard. These bands are especially suited for **Integrated Access and Backhaul (IAB) and wireless-to-the-home (FWA) deployments**, offering high throughput and low latency. Timely allocation of these bands for Access/backhaul use through a transparent and market-based mechanism will significantly enhance network efficiency, lower costs, and enable rapid coverage expansion.

Optimum utilization of Spectrum by restricting outdated technologies.

We submit that there is a need to put a limit of N-2 on the technology to be deployed with valuable spectrum. This will ensure that the TSPs and customers would be required to migrate to latest technologies in a phase-wise manner. Thus, when 5G is the leading global mobile communication technology, no network should be wasting the spectrum resources in 2G. This will help maximize spectral efficiency, with 5G achieving up to 20X higher spectral efficiency as compared to

2G. The Authority is aware that the newer-generation technologies are far more energy-efficient, with 5G using 50× less power per MHz than 2G and delivering 270X more data per watt. This will also be beneficial in the terms of lower OPEX, simplified operations, and sustainability, as newer generations consume far less power per MHz and deliver significantly higher data efficiency.

Promote Indigenous Technologies

The Indian telecom networks should not be completely dependent on 3GPP and other global standards and there should be sufficient space for indigenous technologies to develop and prosper and going forward these can become key tech exports. However, the NIA conditions require a new technology to be deployed only if it is approved by international standards bodies or TEC. However, in order to support new technology and promote deployment of indigenous technologies to support “Atmanirbhar Bharat” goals the processes need to be more permissive.