BROADBAND INDIA FORUM
"Think Tank for Digital Transformation"

Suites- 401 & 410, Avanta Business Centre,
4th Floor, Statesman House, Barakhamba Road,
Connaught place, New Delhi-110001

18 November, 2025
Ref. No. TVR/1149/2025

Shri Akhilesh Trivedi,
Advisor (Network, Spectrum & Licensing),
Telecom Regulatory Authority of India (TRAI),
New Delhi.

Ref: TRAI Consultation Paper on the Auction of Radio Frequency Spectrum in the Frequency Bands Identified for International Mobile Telecommunications (IMT)

Subject: BIF's Counter-Comments on the Consultation Paper on the Auction of Radio Frequency Spectrum in the Frequency Bands Identified for International Mobile Telecommunications (IMT)

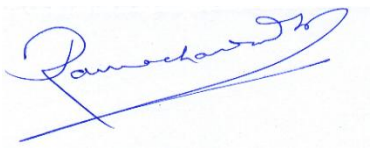
Dear Sir,

This refers to the comments submitted by a few stakeholders on the **Consultation Paper on the Auction of Radio Frequency Spectrum in the Frequency Bands Identified for International Mobile Telecommunications (IMT).** Broadband India Forum (BIF) hereby wishes to submit its counter-comments for your kind consideration (Annexure 1).

We reaffirm our earlier submissions on the above mentioned **Consultation Paper** which also address some of the comments raised now by few stakeholders. We request that our comments and counter-comments be considered together for a holistic evaluation.

Thanking you,

Best Regards,



TV Ramachandran,
President,
Broadband India Forum

Annexure -1 to BIF Letter Ref. No. TVR/1149/2025 dated 18th November'2025

BIF's Counter-Comments on the Consultation Paper on the Auction of Radio Frequency Spectrum in the Frequency Bands Identified for International Mobile Telecommunications (IMT)

We submit that this Consultation Paper is of critical importance, and several stakeholder comments risk diverting attention from the core policy issue and also, from the broader national priorities such as the need for delicensing of the entire 6 GHz spectrum band, among others.

As the country builds the foundational infrastructure for 6G, AI-driven services, high-performance computing, and widespread digital inclusion, spectrum decisions must be firmly rooted in statutory mandates, global evidence, and long-term national priorities. In this context, several submissions made by certain stakeholders diverge significantly from the technical realities, global ecosystem developments, and the legislative framework governing spectrum assignment in certain key spectrum bands viz. 6GHz. Such submissions, if left unaddressed, risk distracting from the central policy question before the Authority. We submit that TRAI's recommendations must focus on how India can unlock maximum consumer welfare and economic value in a technologically feasible manner.

BIF therefore considers it essential to place on record a clear and factual context before responding to individual claims. Specifically, these counter-comments aim to clarify misconceptions, correct factual inaccuracies, and present evidence-backed reasoning in support of immediate delicensing of the lower 6 GHz band and thereafter to also delicense the upper 6GHz band asap. We submit that misplaced proposals calling for IMT allocation in the 6 GHz band are inconsistent with present-day technology and ecosystem readiness, consumer needs, and global regulatory best practices across the globe.

We urge TRAI to provide its recommendations such that they directly advance India's broader national objectives of universal broadband access, affordable connectivity, enterprise productivity, rural digitalisation while ensuring spectrum efficiency which is epitomised by the concept of spectrum sharing through delicensing of the spectrum band viz. 6GHz.

Comment 1:

A few stakeholders have demanded that the entire 1200MHz of the 6 GHz band be allocated through auction for IMT (5G/6G) and not be divided for low powered delicensed Wi-Fi use. They claim it will facilitate early rollout of world class networks and indigenous technology development and also state that PM-WANI is not necessary anymore due to the dominance of mobile broadband.

BIF's Counter Comments:

1.1. At the outset, it is important to note that the aforementioned submissions by the incumbents represent yet another attempt to derail the government's momentum on delicensing critical bands. These comments overlook the clear technological, economic and consumer-welfare linked evidence of delicensing 6 GHz, and also ignore the fact that **no global IMT ecosystem exists for 6 GHz**, that **sufficient spectrum for IMT/6G has already been identified**, and that **over 84 countries have already delicensed the lower 6GHz band while about 14 developed economies have delicensed the entire 6GHz band (lower+upper 6GHz band)** It is therefore essential that TRAI view such positions in the correct perspective and assess them against the demonstrable public-interest and economic advantages of delicensing the 6 GHz band.

1.2. Hence, BIF requests that the TRAI recommend **immediate delicensing of the lower 6GHz band in consonance with the Draft Gazette Notification issued by the DoT on 16 May 2025**. In addition to this, we strongly recommend that the **upper 6GHz band (6425-7025MHz) must also be made available for delicensed use asap.**

1.3. This additional 600MHz in conjunction with the 500MHz in the lower 6GHz band, would provide together a solid chunk of 1100 MHz band which will help provide 3 channels of 320 MHz and an additional channel of 160MHz concurrently. This will enable the consumer to download high bandwidth intensive applications like 4K/8K video, advanced gaming, AR/VR/XR, robotic surgeries, besides spurring innovation. **We submit the following justification as to why delicensing of the entire 6GHz band (lower+upper 6GHz) will be beneficial for both the consumers and the country and align with the country's larger National Goals, than its use for IMT. This should be read in conjunction with the reasoning given by us in our comments to the CP dated 4.11.2025.**

1.4. **Immediate consumer benefit via license-exempt Wi-Fi 7.**
The upper-6 GHz band is pivotal for next-generation Wi-Fi (Wi-Fi 7 and beyond), enabling wider channels (160/320 MHz), lower latency, and higher throughput for

homes, enterprises, education, healthcare, and public venues. Delicensing the lower 6GHz band—at least for low-power indoor (LPI) and very low power (vLPi)use now and thereafter delicense the upper 6GHz band would deliver immediate gains to Indian consumers and enterprises

Delay in delicensing the 6GHz band is causing a daily Economic Loss to the nation of INR 630 Crores (estimated on a conservative basis):

1.5. As per Dr. Raul Katz (Dynamic Spectrum Alliance) Report based on a study carried out specifically for India, the Total Economic Value of allocating the 6GHz band for Wi-Fi is estimated to be USD 4030 Billion which amounts to **322.4 lakh Crores** over a period of 10 years. This roughly translates to an Average per year of 32.24 lakh crores.

1.6. Basis a more conservative estimate which was carried out by Prof. Rekha Jain, formerly of IIMA in 2021, estimated the Economic Value of Delicensed Spectrum Bands in 2025 would have been **2.3 lakh Crores**, provided the 6GHz band was delicensed by 2023.

1.7. From the above studies it is evident that even on a conservative basis, the **Daily Economic loss to the nation amounts to a minimum of INR 630 Crores.**

The global device and infrastructure ecosystem for 6 GHz Wi-Fi is mature and shipping at scale today, while a robust handset and radio ecosystem for 6 GHz IMT does not even exist today.

1.8. So, identification and auctioning spectrum that lacks immediate, widespread IMT ecosystem support begets uncertainty and disruption to the services of the incumbent users (fixed services, fixed satellite services of ISRO and other commercial satellite operators, etc.) in the short term, and under-utilization in the medium to long term, and delaying or potentially not realizing the socioeconomic benefits that can be readily delivered by 6 GHz Wi-Fi which already possesses a mature ecosystem.

Delicensing of 6GHz for use by Wi-Fi (instead of auction for IMT) will lead to Energy Efficiency and Environmental Sustainability -which will be in consonance with our Sustainability Goals.

1.9. Wi-Fi's inherent energy efficiency and spectrum reusability contribute meaningfully to sustainability objectives, including e-waste reduction and the development of sustainable digital infrastructure. Wi-Fi industry supports India's commitment to decarbonization targets and net-zero goals. We recognize that efficient spectrum management plays a critical role in reducing energy consumption and carbon emissions.

1.10. As a key enabler of digital connectivity, Wi-Fi provides energy-efficient broadband access while reducing the need for extensive infrastructure builds—contributing directly to environmental and sustainability goals.

1.11. The WIK Consult study[1] has established that use of IMT (in the upper 6GHz band) instead of delicensed 6GHz WiFi **would require 16% more energy, translating to as much as 3.2 megatons additional CO2 emissions** for Europe per year. If the entire 6GHz band were to be delicensed in India (which has nearly double the population of Europe and higher GDP growth), the **energy savings annually would be several orders higher - probably be about 10-15 megatons of CO2.**

1.12. Moreover, Wi-Fi contributes to reduced CO_2 emissions in the following ways:

- Offloading mobile traffic: Wi-Fi reduces the power consumption and environmental impact of traditional cellular infrastructure.
- Supporting fiber deployments: Wi-Fi eliminates the need for energy-intensive cellular towers in residential and enterprise environments.
- Incorporating energy-saving features: Wi-Fi 6/6E and Wi-Fi 7 technologies include innovations such as Target Wake Time, which significantly reduces power consumption for connected devices.
- Enabling smart building automation: Wi-Fi powers IoT-based energy management systems that optimize energy use in homes, offices, and industrial environments.
- Facilitating remote services: Wi-Fi supports remote work, telehealth, and digital learning—helping reduce transportation-related emissions.
- Empowering smart agriculture: Wi-Fi-based connectivity enables precision farming, minimizing resource waste and lowering the carbon footprint of agricultural operations.

Delicensing of 6GHz will lead to efficient spectrum utilization in areas where more than 80% of data is generated and consumed.

1.13. The majority of broadband data is ultimately delivered over Wi-Fi at the edge. Opening the upper-6 GHz for Wi-Fi aligns spectrum supply with demand points (homes, enterprises, dense venues), improving spectral efficiency and quality of experience for the consumers while complementing India's licensed mobile network infrastructure.

[1] https://www.wik.org/en/publications/publication/nachhaltigkeitsvorteile-bei-der-6-ghz-spektrum-vergabe

Delicensing of 6GHz will lead to safeguarding the interests of the incumbents viz. ISRO and commercial satellite operators deploying Fixed Satellite Services (FSS) besides ease and practicality of implementation.

1.14. Delicensing of the entire 6GHz Spectrum band is the most efficient form of spectrum utilization, by virtue of being a shared spectrum usage. This leads to sharing of spectrum in the most efficient manner by all players-incumbents as well as new entrants. This form of utilization also supports/enables modern and next -generation WiFi viz. WiFi 6E & WiFi.

1.15. Upper-6 GHz hosts important incumbent services. Establishing a license-exempt regulatory regime (based on LPI & VLPI now) offers TRAI a proven, low-risk coexistence solution that can be implemented faster and at scale, avoiding the protracted coordination challenges that would accompany exclusive and higher power IMT use.

1.16. While co-existence studies carried out between RLAN(WiFi) using delicensed 6GHz shows peaceful and harmonious co-existence with all incumbent services, it is verily believed that there are persistent challenges for the Fixed Satellite Service deployment by ISRO and other Satcom players, if the band is deployed for IMT.

Global spectrum harmonization and certainty of investment with assured returns.

1.17. A number of countries -at least 14 countries globally viz. US., Korea, Saudi Arabia, Brazil, and some others have already delicensed the entire 6GHz spectrum band. This includes this portion of the band viz. 6425-6725MHz band as well. This band is meant for usage for Modern & Advanced Wi-Fi based on globally harmonised IEEE Standards 802.11ax and 802.11 be. **Aligning India accordingly, will accelerate local manufacturing, drive economies of scale, and reduce costs for Indian consumers and enterprises.**

Delay in delicensing of 6GHz will result in India being unable to take advantage of advanced Digital Regime.

1.18. What delicensed 6GHz can do, cannot be done with existing delicensed spectrum bands (2.4 & 5 GHz). It can work to download intensive data centric applications viz. Advanced Gaming, Sony Playstation 5 Pro, Quest AR/VR headsets, Meta Ray Ban AR/VR Glasses and other High-bandwidth immersive services viz. Industry 5.0, Robotics, AI & E-health including robotic surgeries, all of which need delicensed 6GHz band. Several critical sectors such as education, healthcare, manufacturing, enterprise and agriculture stand to benefit if the 6 GHz spectrum is delicensed. Delay in opening of the band results in denial of these globally available products to Indian consumers besides resulting in the inability to cater to increasing data demand indoors.

1.19. **PM-WANI's Strategic Role & Technology Imperative:**

- Concerns regarding the relevance of PM-WANI Public WiFi in light of India's mobile broadband growth are refuted by clear global and national evidence. Fixed broadband networks carry nearly five times the volume of traffic as mobile broadband, with average per-subscriber usage around 22 times higher globally. **India contributes only 3–5% of global broadband traffic d**espite its large wireless user base, underscoring a **critical gap in productive consumption and competitiveness that only PM-WANI and fixed-broadband models can fill**.
- PM-WANI, with rational and affordable tariffs, is not just a policy option but a pivotal solution for **bridging the digital divide, scaling economic inclusion and providing mass affordable access where mobile caps and costs limit progress.**
- **However, current public WiFi deployments using WiFi 5 & WiFi 6 technology face intrinsic capacity constraints and cannot deliver the throughput and low latency needed for catering to next gen and new applications & services. Immediate permission and deployment of WiFi 6E/7, enabled by delicensing the 6 GHz band for public use, are essential for India to meet its broadband and productivity goals.**
- **PM-WANI should be viewed as a strategic enabler for inclusive economic growth, digital entrepreneurship and next-generation broadband and not as an end goal but as part of a necessary continuum requiring urgent technological and policy upgrades**.

Competition and a level playing field for all

1.20. Preserving 6 GHz for license-exempt use supports **TRAI's objectives of fair competition and a level playing field** for all by empowering millions of small and medium players,—ISPs, device makers, start-ups, campuses, and households—without erecting barriers to entry inherent in exclusive (auctioned) licensing.

1.21. **In view of the above reasons and rationale, we urge TRAI to recommend that :**

- **Entire 6GHz band should be completely delicensed.**
- **Delicense Lower 6GHz band immediately in accordance with the DoT draft Gazette Notification of 16th May, 2025 while permitting Wi-Fi low-power indoors (LPI) & VLPI (Very Low Power) to unlock consumer and enterprise benefits now.**
- **Also delicense the upper 6GHz band (6425-7025MHz) thereafter at the earliest in accordance with at least 14 developed economies globally viz. US., Korea, Saudi Arabia, Brazil, and some others which have already delicensed the entire 6GHz spectrum band.**

This shall help deliver rapid, tangible benefits to Indian users and industry, advance TRAI's pro-consumer and pro-competition objectives, and enable acceleration towards achieving a Digital India and accelerate our roadmap towards becoming a Viksit Bharat by 2047.

Comment 2

A few stakeholders have said that –

- L band (1-2GHz) & S band (2-4GHz) frequencies, which are used for mobile satellite connectivity and next-gen telecom applications should be included in the upcoming spectrum auctions.
- All backhaul spectrum bands including E & V band should be auctioned.
- These bands (backhaul & spectrum) should be treated on par with IMT spectrum and auctioning these bands will provide a level playing field for telecom and satellite providers, foster healthy competition and support emerging technologies for both indoor and remote environments.
- Administrative allocations should not be done, where government agencies assign spectrum without transparent market pricing as it could favour a handful of players and stifle sectoral innovation.
- India should mirror global best practices that increasingly favour auctions for satellite spectrum.

BIF's Counter Comments:

2.1. We submit that these arguments by certain stakeholders suffer from a basic misunderstanding of the statutory framework, the nature of Satcom spectrum, and globally accepted licensing principles. The arguments advanced seek to reopen questions that are already conclusively settled in law, and blatantly ignore the explicit provisions of the Telecom Act 2023, conflating fundamentally different categories of spectrum use. In this context, BIF seeks to set the record straight through the following clarifications:

a. The issue of **method of assignment of Satcom spectrum for FSS applications in all Satcom spectrum bands** is already settled under Schedule 1 of the Telecom Act 2023. Hence the question of reviewing the same, albeit for any band viz. L & S bands simply doesn't arise. **It would be ultra vires the provisions of the Act itself and would not be legally tenable.**
b. By virtue of the fact that Satcom spectrum is principally always a shared spectrum which can be shared by any number of operators and is never given exclusively, hence it cannot be auctioned. In fact, it is the highest and best methodology for efficient utilization of spectrum i.e. by virtue of sharing of spectrum amongst any number of operators , thereby leaving no spectrum spot unutilized.
c. For a same band there can be and have been different modes of assignment of spectrum based on their applications. While access spectrum is always

assigned through spectrum auction, backhaul spectrum (on different spots within the same band) can be and is always assigned administratively. Further, as per Schedule 1 of the Telecom Act, all spectrum bands designated for backhaul are to be assigned only through administrative manner.

d. **In case of E band which is used for multi gigabit backhaul, the band is to be given administratively in a 'light touch' manner, as per global best practices**.
e. **In case of V band (57-71GHz), while the lower V band (57-66GHz) should be delicensed as it is impacted by absorption of oxygen molecules and atmospheric attenuation, the upper V band (66-71GHz) should be made available to Telcos for backhaul. However, allocation in the upper V band may be done administratively in alignment with Schedule 1 of the Telecom Act for all backhaul bands**

2.2. The above rationale has been uniformly applied across all major jurisdictions, reflecting a clear global consensus on the administrative assignment of Satcom and backhaul spectrum. Accordingly, any suggestion to auction Satcom or backhaul spectrum is wholly misplaced and is outside the realm of legal, technical, and regulatory feasibility.

2.3. **Hence, we support and request TRAI to maintain this position in its recommendations as has been done previously, and also followed by the DoT. This is fully aligned with these internationally recognised best practices.**

Comment 3

A few stakeholders have urged the Authority to:

- Review Net Neutrality or make "flexible rules for Net Neutrality" to facilitate launch of "tariff products" based on network slicing technology under 5G SA . They have said "that these products are for a defined upload speed slice and low latency gaming slice, etc ". They have cited few jurisdictions which have done so.
- Bring parity in communication between OTTs and TSPs, bring LTGs under the DBN framework.
- Bring Indian EM Radiation (EMF) norms at par with ICNIRP norms, restricting outdated technologies viz. 2G/3G from using spectrum, thereby compelling the TSPs offering these services and their customers to migrate to the latest technologies.

BIF's Counter Comments:

3.1. The present Consultation Paper relates to the auction of IMT spectrum bands, and these suggestions fall wholly outside the mandate of this consultation paper. Such extraneous propositions must not be entertained in this process, as they risk diluting the main scope of the CP, confusing the regulatory objective, and diverting the Authority from the clearly defined terms of reference. These matters require independent, evidence-driven consultations and not backdoor insertion into a spectrum auction framework. They must therefore not be considered in the present consultation.