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

Dear Shri Akhilesh Kumar Trivedi,

IEEE 802 LAN/MAN Standards Committee (LMSC) thanks the Telecom Regulatory Authority of India (TRAI) on its ongoing work in the area of spectrum management. The consultation paper on Auction of Radio Frequency Spectrum in the Frequency Bands Identified for International Mobile Telecommunications (IMT) is valuable to inform the public of the areas in which TRAI expects to focus and to solicit feedback that will provide the TRAI with the information necessary to proceed.

IEEE 802 LMSC is a leading consensus-based open standards development committee for networking standards that are used by industry globally. It produces standards for networking devices, including wired and wireless local area networks (“LANs” and “WLANs”), wireless specialty networks (“WSNs”), wireless metropolitan area networks (“Wireless MANs”), and wireless regional area networks (“WRANs”). Technologies produced by implementers of our standards are a critical element for all networked applications today.

IEEE 802 LMSC is a committee of the IEEE Standards Association and of Technical Activities, two of the Major Organizational Units of the IEEE. IEEE has over 460,000 members in more than 190 countries and its core purpose is to foster technological innovation and excellence for the benefit of humanity. IEEE is also a major accredited standards development organization whose standards are recognized worldwide. In submitting this document, IEEE 802 LMSC acknowledges that other components of IEEE Organizational Units may have perspectives that differ from, or compete with, those of IEEE 802 LMSC¹.

Please find below the responses of IEEE 802 LMSC on the following questions: Q14, Q15, Q16, and Q20.

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.

IEEE 802 LMSC respectfully asks TRAI not to put any spectrum in the upper 6 GHz band (including 6425 MHz to 6725 MHz and 7025 MHz to 7125 MHz) to auction for IMT in the forthcoming auction.

Instead, IEEE 802 LMSC strongly recommends that the entire 6 GHz frequency band, including the upper 6 GHz band (6425 MHz to 7125 MHz), be made available for delicensed use rather than being reserved for exclusive licensed services or auctioned. Making the entire 6 GHz band

¹ This document solely represents the views of IEEE 802 LMSC and does not necessarily represent a position of either the IEEE or the IEEE Standards Association.

available for delicensed access now by authorizing low power indoor operation across the upper 6 GHz band will provide significant public benefits to your nation by enabling the rapid adoption of readily available wireless technologies (e.g., Wi-Fi 7 based on IEEE Std 802.11be-2024 technologies), fostering a broad innovation ecosystem, and supporting the increasing demand for high-capacity, low-latency connectivity across multiple sectors. Wi-Fi 7 products supporting 320 MHz channels are now prominent in the global market. According to a recent report from the Wi-Fi Alliance², hundreds of millions of Wi-Fi 7 devices have been shipped globally since 2024 with this number expected to exceed 2.1 billion by 2028.

The expansion of delicensed spectrum in the 6 GHz band is essential for the continued growth of advanced Wi-Fi (Wi-Fi 6E, Wi-Fi 7, and Wi-Fi 8 in the future), which is critical for delivering gigabit speeds and reliable wireless connectivity in homes, enterprises, and public spaces. Recent industry analyses underscore that delicensed 6 GHz access is instrumental in supporting bandwidth-intensive applications including telehealth, rural education, farming, commerce, remote work, industrial automation, and high-definition streaming while also relieving congestion on the legacy delicensed bands (i.e., 2.4 GHz and 5 GHz). Recent studies have also assessed the economic value of Wi-Fi to India for the next decades which shows the importance of access to delicensed spectrum³.

Full allocation of the untruncated 1200 MHz spectrum also unlocks new opportunities for Fixed Wireless Access (FWA), allowing providers to deliver high-speed broadband to underserved and rural communities where traditional wired infrastructure may not be economically feasible. Multiple manufacturers provide 6 GHz Standard Power Wi-Fi based FWA solutions in the United States of America and Canada which demonstrate that FWA deployments using delicensed 6 GHz spectrum can significantly reduce the digital divide and accelerate universal broadband coverage. For example, Radisys, an Indian company owned by Reliance Jio, builds 5 GHz and 6 GHz broadband access gear based on IEEE 802.11 technologies through the acquisition of Mimosa Networks which has large FWA installations through India⁴.

Hybrid spectrum sharing models where delicensed technologies such as Wi-Fi are prioritized for indoor environments and licensed IMT services are focused on outdoor mobile broadband are emerging as practical and efficient approaches. This flexible model promotes coexistence, maximizes the utility of the band, and aligns with global regulatory trends. For example, UK Ofcom actively works on the sharing of the upper 6 GHz spectrum between mobile and Wi-Fi services and preparing to enable the entire 1200 MHz spectrum for delicensed use before the end of 2025⁵.

In contrast, dedicating the upper 6 GHz band solely to licensed services and auctioning it for exclusive use risks spectrum underutilization, reduced competition, and higher consumer costs, while limiting the broad societal and economic benefits that open and delicensed access enables. Delicensed spectrum fosters a vibrant, competitive marketplace-encouraging innovation, lowering barriers to entry, and enabling a diverse range of applications and business models.

² See Wi-Fi Alliance introduces Wi-Fi CERTIFIED 7™, <https://www.wi-fi.org/news-events/newsroom/wi-fi-alliance-introduces-wi-fi-certified-7> [Last accessed: 21 October 2025].

³ Dynamic Access Alliance, “Assessment of the economic value of the 6 GHz spectrum band in India,” October 2024, <https://www.dynamicspectrumalliance.org/2024/nov/Assessing-the-economic-value-of-Wi-Fi-India-2034-2044.pdf>, [Last accessed: 21 October 2025].

⁴ See Fierce Network: Mimosa’s Fix for the Rural Broadband Crunch, <https://www.fierce-network.com/sponsored/mimosas-fix-rural-broadband-crunch>, [Last accessed: 21 October 2025].

⁵ See Ofcom pioneers sharing of upper 6 GHz spectrum between mobile and Wi-Fi services, <https://www.ofcom.org.uk/spectrum/innovative-use-of-spectrum/ofcom-pioneers-sharing-of-upper-6-ghz-spectrum-between-mobile-and-wi-fi-services>, [Last accessed: 21 October 2025].

In summary, making the entire 6 GHz band available for delicensed use, with the flexibility for hybrid sharing models, will yield substantial economic, social, and technological benefits, support digital transformation and maximize spectrum value for the public interest.

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.

IEEE 802 LMSC strongly advises against auctioning the spectrum in the 6425 MHz to 6725 MHz and 7025 MHz to 7125 MHz ranges for IMT in any future auction until after the completion of comprehensive international studies and real-world assessments. ITU region 3 is working on finalizing the 7 GHz spectrum (7125 MHz to 8400 MHz) for IMT use and any auctioning decision in the upper 6 GHz band is recommended to be delayed until this spectrum is finalized in the region.

The upper 6 GHz band is presently the subject of extensive technical review and coexistence studies by global regulatory bodies. These studies are essential for determining whether IMT deployment in these frequencies can coexist with incumbent fixed, satellite, and rapidly expanding delicensed uses such as Wi-Fi 6E, Wi-Fi 7, and fixed wireless access without harmful interference. Recent deployments of delicensed 6 GHz spectrum have demonstrated significant benefits for consumers and the broader economy, including dramatic improvements in indoor wireless capacity, support for hybrid work, digital education, and bridging the digital divide through fixed wireless access with outcomes documented in recent industry and academic research. For example, in 2024, Wi-Fi Alliance and the Faculty of Medicine Ramathibodi Hospital at Mahidol University in Thailand successfully completed a seven-month trial showcasing the benefits of 6 GHz Wi-Fi for healthcare⁶. The study, supported by the United States Trade and Development Agency (USTDA), demonstrated improved performance for medical applications like AR/VR training and near-instant response times, addressing network overload and latency issues with legacy Wi-Fi spectrum which utilizes narrower channels. The goal was to show how the 6 GHz band with wider channels can transform healthcare by providing high performance and ultra-low latency use cases, and the data collected over the course of the pilot trial showed more than a two-time increase in network data throughput and more than a five-time reduction in latency when using the entire 6 GHz band versus the lower 6 GHz band⁷.

IEEE 802 LMSC believes it is critical to allow time for the full evaluation of these delicensed deployments, particularly as hybrid spectrum management approaches, such as prioritizing delicensed use indoors and IMT deployment outdoors, are actively being studied and piloted around the world. These models may ultimately provide the greatest long-term value by efficiently accommodating the needs of diverse users and technologies. Prematurely auctioning the upper 6 GHz spectrum for IMT risks foreclosing these broader benefits and could lead to regulatory fragmentation, reduced innovation, and inefficient spectrum utilization. Therefore, we recommend that no timeline for IMT auctioning be set before the end of World Radiocommunication Conference (WRC) 2027, allowing for the completion of ongoing technical studies, harmonization efforts, and market impact assessments. This measured approach will best ensure that any future decisions

⁶ See Wi-Fi Alliance® and Faculty of Medicine Ramathibodi Hospital drive 6 GHz Wi-Fi® innovation in Thailand, <https://www.wi-fi.org/news-events/newsroom/wi-fi-alliance-and-faculty-medicine-ramathibodi-hospital-drive-6-ghz-wi-fi>, [Last accessed: 21 October 2025].

⁷ See Wi-Fi Alliance 6 GHz Wi-Fi® Trial in Thailand Report (2025), <https://www.wi-fi.org/file/6-ghz-wi-fi-trial-thailand-report-2025>, [Last accessed: 21 October 2025].

regarding the 6425 MHz to 6725 MHz and 7025 MHz to 7125 MHz bands are aligned with global best practices and maximize public benefit.

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.

IEEE 802 LMSC highlights the necessity of the pilot trials to determine the keep-out distance between IMT base stations and satellite uplink stations in the upper 6 GHz band being conducted prior to any auction of this spectrum, rather than leaving this critical assessment to individual telecom service providers at the time of commercial deployment. Determining the appropriate separation distances between IMT and satellite services is a complex technical issue, involving multiple propagation environments, deployment scenarios, and interference mitigation techniques. Relying solely on theoretical studies or delegating this responsibility to service providers post-auction risks inconsistent implementations, potential harmful interference, and costly retroactive corrections, which could disrupt both satellite and terrestrial services. Wi-Fi poses a significantly lower risk to the existing satellite services than IMT due to the lower power and indoor nature of the Wi-Fi deployments.

In summary, IEEE 802 LMSC recommends that hybrid sharing of the upper 6 GHz band to be considered and pilot trials to be established in parallel to evaluate the necessary keep-out distances for IMT base stations in relation to satellite uplink stations before any auction consideration of the upper 6 GHz band. This approach ensures evidence-based policymaking, protects incumbent users, and provides a stable and predictable regulatory environment for all stakeholders.

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.

IEEE 802 LMSC would like to strongly reiterate that the 6 GHz spectrum in the upper 6 GHz bands should not be included in the forthcoming auction. There are several critical reasons for this position.

First, the upper 6 GHz band is currently undergoing extensive international studies and coexistence assessments. Premature auctioning before all aspects are studied would undermine evidence-based policymaking and could result in inefficient or fragmented spectrum use.

Second, recent real-world deployments of delicensed 6 GHz spectrum have demonstrated substantial benefits to connectivity, economic growth, and digital inclusion through advanced Wi-Fi and fixed wireless access services. These outcomes highlight the importance of preserving the band for delicensed and hybrid use, maximizing public benefit and supporting innovation across multiple sectors.

Third, incumbent users such as satellite and fixed services require robust protection and coexistence frameworks, which cannot be assured until comprehensive pilot trials and technical evaluations are completed. Auctioning the spectrum without these safeguards in place risks harmful interference to existing services, deployment delays, and regulatory disputes.

In summary, IEEE 802 LMSC recommends deferring any auction of the upper 6 GHz band until at least after WRC 2027, after all necessary technical studies, coexistence trials, and economic impact assessments have been completed, and international harmonization has been achieved. This approach will ensure the long-term value, efficiency, and public benefit of this vital spectrum resource.

Conclusion

IEEE 802 LMSC thanks TRAI for the opportunity to provide this submission and respectfully requests to consider our responses provided in this document.

Respectfully submitted

By: /ss/.

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