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Radio Regulatory Technical Advisory Group (RR-TAG)

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| Draft response to India TRAI’s consultation paper on the auction of radio frequency spectrum in the frequency bands identified for International Mobile Telecommunications (IMT) |
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This document drafts a proposed response to the Telecom Regulatory Authority of India (TRAI)’s consultation on the Auction of Radio Frequency Spectrum in the Frequency Bands Identified for International Mobile Telecommunications (IMT) that seeks public opinions on the auction of the following tentative frequency bands: 800 MHz, 900 MHz, 1800 MHz, 2100 MHz, 2300 MHz, 2500 MHz, 3300 MHz, 26 GHz bands, 6425 MHz to 6725 MHz, and 7025 MHz to 7125 MHz bands and 600 MHz bands.

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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 LMSC[[1]](#footnote-2).

Please find below the responses of IEEE 802 LMSC on the following questions: Q14, Q15, Q16, Q17, Q18, Q19, Q20, and Q23.

**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 is highly supportive of the decision to delicense the lower 6 GHz band for low power applications. In our view, there is no need to prescribe certain measures to provide necessary protection to incumbent users, including but not limited to Fixed Microwave (backhaul) Services and Fixed Satellite Service (FSS), when operating indoors at low power (LPI) or with very low power (VLP) in the 6 GHz (lower) band. A study conducted by Broadband India Forum[[2]](#footnote-3) also supports our view.

**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.**

In addition to LPI and VLP operation in lower 6 GHz band, IEEE 802 LMSC recommends TRAI also enable standard power (SP) operation as well. SP enables Wi-Fi operation at higher power than both the very low power (VLP) and the low power indoor (LPI) modes, to optimally utilize the 6 GHz spectrum. In order to enable SP operations effectively, IEEE 802 LMSC recommends TRAI to consider initiating proceedings to utilize an Automated Frequency Coordination (AFC) system in the 6 GHz (lower) band.

AFC technology is used to protect incumbent services during outdoor and indoor operations at standard power level for Wi-Fi operation. IEEE 802 LMSC believes that an AFC system can provide effective automated spectrum sharing to enable essential Wi-Fi technology applications and use cases not only for outdoor operation but also indoor operation in the 6 GHz (lower) band.

The USA[[3]](#footnote-4) and Canada[[4]](#footnote-5) have already started certification of AFC systems. The certification process for AFC systems and devices is based on industry developed recommended compliance specifications[[5]](#footnote-6),[[6]](#footnote-7). Many AFC controlled SP Access Points and Fixed Client devices are already certified in the USA and Canada.

IEEE 802 LMSC notes the presence of different types of incumbent services operating in 6 GHz (lower) band in India. Our understanding is that existing AFC systems are designed with flexibility built-in specifically to enable an AFC system to be customized based on local spectrum regulatory requirements. Therefore, with proper consideration of protection criteria for the existing incumbent services, we believe that AFC systems can properly implement the frequency coordination and maximum allowable power settings for AFC-enabled devices. As an example, in the USA, AFC systems determine frequency and channel availability and maximum permissible power levels for AFC devices considering incumbent fixed services and radio astronomy services.

AFC systems are designed to automatically calculate and make available, to AFC devices, available frequencies and corresponding permissible transmit power levels. AFC systems are required to use the updated incumbent system database to keep the calculations and frequency availability up to date as 6 GHz incumbent links are changed. This means that incumbent services are protected from harmful interference by AFC systems, and that any expansion of such incumbent services over time can be achieved without a need to redesign the AFC systems.

**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 believes that

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

1. **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?**

IEEE 802 LMSC recommends that

1. **What amount of spectrum in the 6425-6725 MHz and 7025-7125 MHz ranges should be put to auction?**
2. **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?**
3. **What should be the block size, minimum bid quantity, and roll-out obligations for the spectrum in these ranges?**
4. **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.**

**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.**

IEEE 802 LMSC recommends that

**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.**

IEEE 802 LMSC believes that

**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 recommends that

**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.**

IEEE 802 LMSC strongly recommends that TRAI

In general, we recommend TRAI to consider the FCC’s rule making *Report and Order*, FCC 03-248[[7]](#footnote-8), adopted on October 16, 2003, for reference.

Lastly, … and we recommend TRAI to investigate this option.

**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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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. [↑](#footnote-ref-2)
2. See Frequency Sharing for RLAN for 6 GHz band in India, October 2021, <https://broadbandindiaforum.in/wp-content/uploads/2021/11/Frequency-Sharing-for-RLANs-in-the-6GHz-band-in-India_Accessible.pdf> [Last accessed: 9th June 2025] [↑](#footnote-ref-3)
3. See Federal Communications Commission: OET announces approval of seven 6 GHz band automated frequency coordination systems for commercial operation and seeks comment on C3 Spectra’s proposed AFC system, <https://docs.fcc.gov/public/attachments/DA-24-166A1.pdf> [Last accessed: 9 June 2025]. [↑](#footnote-ref-4)
4. See Innovation, Science and Economic Development Canada: List of designated Dynamic Spectrum Access System Administrators (DSASAs), Automated Frequency Coordination System Administrators (AFCSAs), issue 1 of DBS-06, <https://ised-isde.canada.ca/site/certification-engineering-bureau/en/node/116> [Last accessed: 9 June 2025]. [↑](#footnote-ref-5)
5. See: Wi-Fi Alliance: 6 GHz AFC resources, Specifications, test plans, and training modules to enable implementation of the 6 GHz standard power devices under AFC system control, https://www.wi-fi.org/discover-wi-fi/6-ghz-afc-resources [Last accessed: 9 June 2025]. [↑](#footnote-ref-6)
6. See Wireless Innovation Forum: Specifications, <https://6ghz.wirelessinnovation.org/baseline-standards> [Last accessed: 9 June 2025]. [↑](#footnote-ref-7)
7. See <https://docs.fcc.gov/public/attachments/fcc-03-248a1.pdf> [Last accessed: 9 June 2025]. [↑](#footnote-ref-8)