Annexure-1

TRAI Consultation Paper (No. 05/ 2025 dated 28th May, 2025) on Assignment of the Microwave Spectrum in 6 GHz (lower), 7 GHz, 13 GHz, 15 GHz, 18 GHz, 21 GHz Bands, E-Band, and V-Band

About SIA-India:

The Satcom Industry Association of India (SIA-India) is a non-profit organization established to serve and promote the common interests of the satellite industry ecosystem in India and seeks to ensure that the satellite industry benefits from the appropriate political, industrial and regulatory environment to fulfil their vital role in the efficient and ubiquitous delivery of satcom services in India.

As a trade association, we strongly articulate the need for certainty in the satellite industry which is absolutely vital to attract investments and ensure continued development of existing and new satellite capabilities.

SIA-India is pleased to provide comments to the relevant questions, which we feel will impact satellite services as under:

Q3. Which of the following methods should be used for the assignment of the spectrum in traditional microwave backhaul bands for radio backhaul purposes for various commercial telecommunication services:

(a) Block-basis in LSA,
(b) Point-to-point link-basis, or
(c) Any other?
Please provide a detailed response with justifications in respect of the relevant commercial telecommunication services.

It will be prudent to consider the frequency bands under reference in the document be restricted to point-to-point backhaul only.

Q9. As the 7125-8400 MHz range in the 7 GHz band and the 14.8-15.35 GHz range in the 15 GHz band are being considered for IMT in WRC- 27, whether there is a need to review the usage of 7 GHz and 15 GHz microwave backhaul bands at this stage itself, or should the review be undertaken after considering the outcome of WRC-27? Kindly provide a detailed response with justifications.

SIA-India is of the considered opinion that WRC is the competent forum to decide the possible use of the bands 7 GHz band (7125-8400 MHz) and 15 GHz band (14.8-15.35 GHz) the terrestrial component of IMT in the frequency bands based on the appropriate studies studies of technical, operational and regulatory issues during current WRC-27 study cycle by ITU-R Working Parties.

Presently, the frequency range 7125 – 8400 MHz is used for communication between the earth stations and space stations of the Earth Exploration Radio Service (EESS), Fixed Satellite Service (FSS), Meteorological Satellite Service (MetSat), Mobile Satellite Service (MSS) and Space Research Radio Service (SRS). This band is heavily used by Satcom with downlink in 7250-7750 MHz and uplink in 7900-8400 MHz to support many applications. Particularly, the uplink band 7900-8400 MHz could have sharing characteristics close to the upper 6 GHz band (FS military point-to-point, audio-visual transport and FSS uplink). The protection of space stations in this band would however be much more critical than in the upper 6 GHz band.

The 15 GHz band (14.8-15.35 GHz) is allocated to SRS and WRC-23 upgraded the SRS use to primary status. Several space agencies operate current and future missions, including manned missions (currently ISRO is also involved) in this frequency band.
SIA-India opposes an IMT identification in the above ranges or parts of thereof as well as in the adjacent bands unless the continued operation of current and future usage of incumbent services is adequately guaranteed by the ongoing compatibility studies at ITU-R level.

In view of the above, it is premature to consider the 7 GHz band (7125-8400 MHz) and the 15 GHz band (14.8-15.35 GHz range) for terrestrial IMT microwave backhaul. Hence, it is prudent to wait and align with any outcome of WRC-27 on Agenda item 1.7 for identifying spectrum for mobile use.

Q10. In case it is decided to review the usage of 7 GHz and 15 GHz bands at this stage itself, what should be the policy framework for the assignment of the spectrum in 7 GHz and 15 GHz microwave backhaul bands to take care the possible outcomes of AI 1.7 of the WRC-27? Kindly provide a detailed response with justifications.

In view of our response to Q9 above, we do not support any review to the 7 GHz and 15 GHz bands at this stage itself.

Q16. Considering that the Government has decided to delicense the 6 GHz (lower) band (5.925-6.425 GHz) for low power applications, whether there is any need to prescribe certain measures to provide necessary protection to incumbent users such as Fixed Microwave (backhaul) Services, Fixed Satellite Service (FSS) etc. operating in the 6 GHz (lower) band? If yes, which specific measures should be prescribed for this purpose? Kindly provide a detailed response with justifications.

The lower 6 GHz band 5.925-6.7 GHz is allocated for FSS (Earth-to-Space) services and are used for feeder links in the band. Therefore, the delicensed wi-fi (WAS/RLAN) use in this band would strictly be limited to the technical parameters mentioned in the DoT notification dated 16th May 2025 to avoid interference to FSS feeder links. It should be ensured that RLAN(Wi-Fi) systems are not granted any protection from satellite earth station transmitters are limited to 'low power indoor' and 'very low power' applications.

Q17. Any other suggestions relevant to the assignment of spectrum in 6 GHz (lower), 7 GHz, 13 GHz, 15 GHz, 18 GHz, and 21 GHz bands may kindly be provided with detailed justifications.

Satellite earth station gateways are currently using frequency bands including 5.725 – 7.075 GHz and 12.75 – 13.25 GHz. Similarly, the access to the C-band (3.8-4.2 GHz) is crucial for satellite for its current and future operations. Given its unique characteristics, C band remains essential to FSS for some specifically critical services which require both global geographical coverage and high resistance to rainfall conditions.

We are concerned that any policy shift in the lower 6 GHz band (for instance, the recent delicensing in this band) may lead to long-term regulatory shift, which could eventually affect the C-band policy for satellites.

The Ku band frequency range 12.75 – 13.25 GHz (Earth to space) is extensively used GSO-FSS systems in accordance with the provisions of Appendix 30B of the ITU RR. In the Ku-band the global demand, utilization and broadband communications application include connectivity requirements for users on aircraft, vessels, and vehicles in motion, is a crucial driver for this spectrum band. The demand is for user terminals that operate at both fixed locations and in motion in urban, suburban and rural areas worldwide. Thus, this band has high demand for Land ESIM, Maritime ESIM and Aeronautical ESIM earth stations. SIA-India also expect that Ku-band (12.75-13.25 GHz) is kept available for ESIM operations.

In this context, the proposals under this consultation raise serious coexistence challenges between terrestrial and satellite services, especially when deployed in the same or adjacent frequency bands. Numerous technical studies have consistently shown that ubiquitous deployment of mobile technologies, especially outdoor point-to-multipoint (PMP) fixed services, is incompatible with the operation of FSS earth stations, even when those stations are at known and coordinated locations.

Critically, PMP deployments involve high-density, high-power transmissions that are distributed across wide areas, which significantly increases the aggregate interference risk to FSS earth station receivers. Unlike point-to-point systems, which are typically directional and more manageable from an interference coordination perspective, PMP networks radiate across broader areas and make harmful interference to FSS much

more likely, especially in urban and suburban areas where satellite gateways or ESIM terminals may also be located.

Co-frequency sharing between FSS and fixed services operating in PMP mode is especially problematic due to the dynamic and non-deterministic interference environment they create, leaving little room for predictable coordination. This interference potential is further exacerbated when PMP links are deployed without adequate geographic separation or when power levels and antenna patterns are insufficiently constrained.

Furthermore, satellite operators require long-term regulatory certainty to justify investments in infrastructure and services that connect underserved areas, support mobility, and underpin digital inclusion efforts. Therefore, to reduce interference risk and support continued growth of both sectors, SIA-India urges that any terrestrial use of the identified bands be strictly limited to point-to-point fixed service links, where interference can be more reliably assessed and mitigated through coordination.

In view of the above, we are concerned that the proposals envisaged in the consultation raise serious issue of coexistence between mobile and satellite services deployed in the same frequency band or adjacent bands. The significant issues concerning coexistence between outdoor IMT and FSS receivers (onboard satellites and in earth stations) in these bands need to be addressed. It is extremely important to note that several technical analyses have time and again demonstrated that co-existence between ubiquitously deployed satellite services and terrestrial mobile services are not feasible. Co-frequency sharing between FSS and MS remains complex even in the case of FSS Earth stations at known location as large separation distances must be observed in order to avoid harmful interference into the earth station receivers.

Furthermore, satellite operators need certainty about the conditions that will guarantee a stable regulatory environment to support investment in broadband and other connectivity services to end users. Hence, it is essential that frequency bands allocated to both terrestrial and satellite services contain the necessary regulatory provisions to ensure the delivery of interference-free services. To alleviate satellite industry apprehensions, it will be prudent that current consultation objectively considers the frequency bands under reference in the document be restricted to point-to-point backhaul only.

In this context, it is prudent to conduct an audit analysis and examine what progress has been made with regards to IMT deployment, and how much spectrum has yet to be allocated and licensed or used from already existing and harmonized mobile spectrum. Hence, SIA-India looks forward to further deliberations on approaches best suited for economies of scale, and nuances such as the extensive power levels and density constraints to be placed on IMT stations to ensure they do not interfere with FSS services.

Q18. What is the level of demand of the spectrum in the E-band (71-76 GHz, and 81-86 GHz) for each of the service/ usage viz. “Backhaul”, “Access” and “Integrated Access & Backhaul (IAB)”? Kindly provide a detailed response in respect of each service/ usage with justification including availability of technical standards and ecosystem.

E bands support broad-band systems in providing backhaul for high-speed and low latency broadband to consumers. 70/80 GHz (71-76 GHz / 81-86 GHz) The 70/80 GHz band is an internationally allocated co-primary band for the fixed-satellite service (FSS). Globally, satellite operators are keen interest in deploying in the E-band to meet growing consumer demand for high-speed low-latency broadband. It is further understood that a number of operators have already filed for next-generation satellite systems with 70/80 GH gateway links. Therefore, availability of adequate spectrum for gateway earth stations are crucial and should not be constrained.

Q19. What is the level of demand of the spectrum in the V-band (57-64/66 GHz) for each of the service/ usage viz. Backhaul, Access and IAB? Kindly provide a detailed response in respect of each service/usage with justification including availability of technical standards and eco-system.

V bands support broad-band systems in providing backhaul for high-speed and low latency broadband to consumers. V bands are key for the future of satellite services and access to V bands plays a critical role in enabling feeder links for the next generation of high and very high throughput satellite systems. Any new approach to allocating and licensing for microwave backhaul purposes in V band should ensure co-existence with satellite services and also should not constrain access to substantial and contiguous spectrum in India.

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