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**U.S.-India
Business Council**

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**Re: USIBC Comments on TRAI Consultation Paper on Assignment of
Spectrum in E&V Bands, and Spectrum for Microwave Access (MWA) &
Microwave Backbone (MWB)**

Dear Shri Bhardwaj,

Since our inception in 1975, the U.S.-India Business Council (USIBC) has tirelessly promoted an inclusive bilateral trade environment between India and the United States, and consistently advocates for a strong, strategic relationship in support of entrepreneurship, job creation and economic growth. We participate in stakeholder dialogues to ensure that India's digital economic growth flourishes on par with the global digital and e-market ecosystem. As you may know, USIBC is an integral part of the U.S. Chamber of Commerce, the largest business advocacy organization in the world, operating throughout the United States and in over 50 countries to promote free enterprise and advance trade and investment, representing companies of every size and from every sector. USIBC directly represents some 200 companies based in India, the United States, Europe, and like-minded Asia nations in support of U.S.-India commerce, investment, and innovation.

USIBC has a long history of working with TRAI and the Indian Government to provide a unified business perspective to promote pro-growth policies, connect decision-makers to industry, and offer thought leadership and international best practices. This year alone, we have provided inputs to a half-dozen TRAI consultations, organized workshops, and events on advanced communications, and provide a platform for innovation, investment, and job creation in the telecom sector. We hosted the TRAI Secretary at our India Ideas Summit in New Delhi, in September 2022, and regularly engage the Authority in support of telecommunications policy, sound regulations, and the development of the sector, including on fraud prevention, spectrum auctions and allocation, satellite communications, and other critical and strategic technologies.



As a key industry stakeholder in the Indo-U.S. Initiative on Critical and Emerging Technologies (iCET), we actively foster strategies for long-term, multi-stakeholder bilateral cooperation in the telecoms and manufacturing sectors. During the iCET launch in January and again in September, we hosted the Department of Telecommunications (DoT) Secretary (T) and his senior leadership. In Summer, we led the Advance Telecom Working Group in Washington DC as part of the U.S.-India Information and Communications Technology Working Group (ICTWG) co-chaired by the Ministry of Electronics and Information Technology (MeitY) Secretary with DoT support. Thus, USIBC is a trusted partner that promotes a vibrant Indian telecommunications sector – from services and manufacturing to enabling a dynamic commercial space ecosystem.

It is with this context that today we write today to share our comments to the TRAI's Consultation Paper on Assignment of Spectrum in E&V Bands, and Spectrum for Microwave Access (MWA) & Microwave Backbone (MWB) (Consultation Paper No. 22/2023) issued on 27th September 2023. **Our central suggestion is that satellite and microwave services can co-exist in the E/V bands, and where needed, adopt interference mitigation measures. Additionally, we advocate that TRAI should hold off on any recommendations in the E-Band as the ecosystem for this band is not fully evolved. We also recommend that the V-band (57-64 GHz) be de-licensed to drive innovation.**

Space-based communication services are critical for bridging the digital divide. Non geostationary orbit (NGSO) fixed-satellite service (FSS) systems will provide satellite-based broadband connectivity to customers in unserved and underserved areas, as well as essential backhaul for the rollout of terrestrial mobile services in India. These space-based communication services can offer rapid deployment of connectivity across remote areas where terrestrial broadband or backhaul solutions are impractical. To do this effectively, satellite systems require access to globally harmonized spectrum in the relevant bands. TRAI should recognize the role of space-based communication services and their spectrum requirements.

USIBC underscores that there is an overlap of spectrum used by space-based communication services and MWA and MWB services in the 17.7-19.7 GHz band. Some satellite systems plan to use these frequencies for space-to-Earth (downlink) transmissions to gateways and customer terminals—including those used for broadband and backhaul services. Internationally, these frequencies are allocated to the FSS and terrestrial services and have successfully coexisted for decades. We request TRAI to adopt a balanced approach and specify technical conditions that will support compatible operations between the FSS and MWA and MWB services. Such an approach will provide connectivity diversity that will benefit Indian businesses and citizens.

USIBC also suggests that TRAI develop new procedures for MWA services to coexistence with uncoordinated earth stations operating with space-based communication services in the



17.7-19.7 GHz ban. These procedures should also adopt a non-interference, non-protected mechanism to enable ubiquitous deployment of satellite customer terminals where both the fixed service (FS) and FSS have co-primary allocation status.

USIBC provide question-by-question responses as an annex to this letter, and thanks you for your consideration of our position. We request to be included in any deliberations on the subject, both formal and informal, given the stakeholders we represent, including many Indian companies. Should your office have any questions, my colleague, USIBC Senior Director of Digital Economy Aditya K. Kaushik, akaushik@usibc.com would be happy to address them. USIBC is committed to enhancing commerce and investment between India and the United States and is grateful that you consider our submission.

Warm regards,

A handwritten signature in blue ink, appearing to read "Jay Gullish".

Jay Gullish
Executive Director
U.S.-India Business Council



Appendix

Q2. Whether spectrum for MWA and MWB should be assigned for the entire LSA on an exclusive basis, or on Point-to-Point (P2P) link basis? Response may be provided separately for (i) TSPs with Access Service License/ Authorization, (ii)TSPs having authorizations other than Access Service License/ authorization, and (iii) Other entities (non-TSP, for non-commercial/ captive/ isolated use) in the table given below with detailed justification:

Microwave bands	Spectrum should be assigned for the entire LSA on an exclusive basis, or on P2P link basis for -		
	TSPs with Access Service License/ Authorization	TSPs with other than Access Service License/ Authorization	other entities (non-TSP, for non-commercial/ captive/ isolated use)
MWB (6/7 GHz)			
MWA (13/15/18/21 GHz)			

Many satellite systems rely on the 17.7-19.7 GHz frequencies for space-to-Earth communications to gateways and customer terminals, and thus, assignment and licensing procedures for MWA should permit the continued coexistence with space-based communication services. We recommend that TRAI adopts well-established international provisions and recommendations that enable smooth operations of both terrestrial and space services that have shared the 17.7-19.7 GHz band for decades. Appendix 7 of the International Telecom Union (ITU) Radio Regulations describes methods for determining the coordination area around earth station which can provide a baseline. The channel modelling of the terrestrial path between an earth station and fixed station can be further refined using Recommendation ITU-R P.452.

TRAI should permit uncoordinated satellite customer terminals on a non-interference, non-protected basis with respect to the Access Service Provider (ASP). These operators should be accountable for mitigating interference from the MWA service.



Exclusive spectrum assignment should only be done for terrestrial services and not space-based communications services. We also wish to submit that the Supreme Court's 2G Judgment does not bind the Indian government to assign spectrum only through auctions.

Q3. Keeping in view the provisions of ITU's Radio Regulations on coexistence of terrestrial services and space-based communication services for sharing of the same frequency range, do you foresee any challenges in ensuring interference-free operation of terrestrial networks (i.e., MWA/ MWB point to point links in 6 GHz, 7 GHz, 13 GHz, and 18 GHz bands) and space-based communication networks using the same frequency range in the same geographical area? If so, what could be the measures to mitigate such challenges? Suggestions may kindly be made with justification.

Coexistence between terrestrial networks like the MWA service and space-based communication services cannot be generalized and can be managed with appropriate assignment mechanisms and technical conditions. Specifically, TRAI should adopt technical conditions applicable to the MWA service that follow ITU-R Recommendations for the fixed service applications in the 18 GHz frequency band. For example, Recommendation ITU-R F.699 contains antenna patterns for stations in the fixed service. Such antenna patterns facilitate compatibility with space-based communication services by managing off-axis emissions. Recommendation ITU-R F.595 contains channel arrangements which enhance operational transparency. Applying these Recommendations and coordination provisions like those in the ITU Radio Regulations are sufficient for space-based communication services to anticipate the magnitude and behaviour of interference. With predictable and transparent spectrum assignment procedures for MWA services and technical conditions following international standards, the interference magnitude and likelihood from the MWA service becomes deterministic, which is mission critical for space-based communication services—particularly for earth stations like gateways. Finally, MWA service is protected from space-based communication services using the power flux-density limits contained in Article 21 of the ITU Radio Regulations.

We request TRAI to extend the practice of blanket licensing for satellite customer terminals to the 17.7-19.7 GHz frequency band to permit ubiquitous deployments of uncoordinated earth stations. The European Conference of Postal and Telecommunications Administrations (CEPT) Electronic Communications Committee (ECC) has studied the compatibility between the fixed service and FSS in ECC Report 232. This report concludes that compatibility can be ensured in the long-term in less populated areas. In urban areas, FSS earth stations could use more than 65% of the 17.7-19.7 GHz band. The study showed that if interference occurred, there were alternative frequencies available to which the FSS earth station could move its traffic. We agree with these conclusions, which support TRAI actions to adopt spectrum assignment methodologies for uncoordinated earth stations in the 17.7-19.7 GHz frequency band. Those uncoordinated earth stations operating with space-based communication services should follow a national-level administrative assignment methodology and operate



on a non-protected basis with respect to the MWA service. This ensures that future operations of MWA are not encumbered with regulatory uncertainty by a potentially large deployment of earth stations (e.g., customer terminals) receiving in the 17.7-19.7 GHz frequency band. TRAI can refer to the European Conference of Postal and Telecommunications Administrations (CEPT) ECC Decision (00)07 adopted in October 2000 (amended March 2016) for more information regarding possible procedural considerations for uncoordinated earth stations.

Q23. What quantum of spectrum in E-band (71-76 / 81-86 GHz) and V- band (57-64 GHz) is required to meet the demand of TSPs with Access Service License/ Authorization? Whether spectrum in E-band and V- band is also required by the TSPs other than Access Service License/ Authorizations, and other entities (non-TSP, for non-commercial/ captive/ isolated use)? Information on present demand and likely demand after five years may kindly be provided as per the proforma given below:

We are supportive in making the 57-64 GHz and if possible, the 64-71 GHz frequency range available under a licence-exempt regulatory regime without the application of light-licensing.

We do not support band fragmentation through different licensing mechanisms for mobile service in the 57-71 GHz. We believe that a licence-exempt approach is appropriate. New services and applications require larger bandwidths to support the consumer demand for data-intensive applications. In addition, the splitting of frequency bands increases the costs and thus causes delay in manufacturing and bringing new devices to market because of regulatory uncertainty.

While we note that the World Radiocommunication Congress (WRC)-19 amended the Radio Regulations to include an International Mobile Telecommunications (IMT) identification in the 66-71 GHz frequency range, it is clearly stated that, “This identification does not preclude the use of this frequency band by any application of the services to which it is allocated and does not establish priority in the Radio Regulations.” It is important to avoid fragmenting 57-71 GHz. This would effectively create a hard-border splitting the 57-71 GHz with Institute of Electrical and Electronics Engineers (IEEE) technologies in 57-66 GHz and 3rd Generation Partnership Project (3GPP) technologies in 66-71 GHz. The footnote in the Radio Regulations for 66-71 GHz addresses this point nicely.

That said, we support licence-exempt use in the 57-64 GHz since it provides greater market certainty, because it avoids the IMT identified bands in 66-71 GHz and provides a valuable guard band.



Q25. Do you agree that the issues relating to the assignment of E-band and V-band for space-based communication services and its coexistence with terrestrial networks may be taken up at a later date? If not, the concerns and measures to overcome such concerns may kindly be suggested with relevant details.

Utilization of the V-band under a license-exempt regime with the applications and power levels authorized in other countries do not present an interference or coexistence risk to space-based services.

Q27. Whether Frequency Division Duplexing (FDD) or Time Division Duplexing (TDD) based configuration should be adopted for V-band carriers? In case you are of the opinion that FDD based configuration should be adopted, detailed submissions may be made with band plan, ecosystem availability, and international scenario.

We would recommend in not imposing restrictions to choose between FDD or TDD for the V band as it will restrict applications. We would recommend that for licence-exempt use in the V-band; a technology neutral approach may be adopted with FDD or TDD operations dictated by the specific applications.

Q28. What should be the carrier size for assignment of spectrum in E-band (71-76/81-86 GHz) and V-band (57-64 GHz)? Whether there is a need to prescribe a different carrier size based on different LSA categories or different user categories viz. (i) TSPs with Access Service License/ Authorization, (ii) TSPs other than Access Service License/ Authorization and (iii) other users (non-TSP, for non-commercial/ captive/ isolated use)? If yes, suggestions may be made with detailed justification.

(iii) We would recommend that carrier sizes in the V-band should be dictated by the applications utilized under a license-exempt regime on a technology neutral basis and do not need to be mandated in regulation The entire V-band should be available for all user categories.

Q29. Whether there is a need to assign spectrum in E-band and V-band in such a way that if a TSP acquires more than one carrier, all the assigned carriers to a TSP are contiguous? Kindly justify your response.

Q31. Whether there is a need to prescribe the maximum number of carriers that can be held by a TSP in E-band and V-band? Kindly justify your response.

Q32. (b) In case it is decided to prescribe a ceiling on the number of carriers that a licensee can hold in E-band and V-band,



Q33. (iii) Which methodology should be used for assignment of spectrum in E- band and V-band? Response may be provided in the table given below:

Q34. In case you are of the opinion that certain user categories should be assigned spectrum in E-band and V-band for P2P links by any methodology other than auction, should some carriers be earmarked for such users? If yes, how many carriers should be earmarked for such users? Kindly justify your response.

Q35. In case it is decided to assign spectrum in E & V bands to the TSPs with Access Service License/ Authorization through auction and adopt P2P links assignment for TSPs other than Access Service License/ Authorization, who may be requiring to establish only a few links, what threshold limit in terms of number of links, may be prescribed, beyond which, the TSPs with other than Access Service License/ Authorization should be required to acquire spectrum in E- band and V-band bands through auction? Kindly justify your response.

Q36 In case it is decided to assign spectrum in E & V bands to all the TSPs through auction, should such TSPs be permitted to lease their spectrum acquired through auction, on P2P link basis, to the TSPs and other entities for non-commercial/ captive/ isolated use, who may be required to establish only a few links? What could be the regulatory issues and potential misuse of such a regime? What measures could be put in place to mitigate the concerns? Kindly justify your response.

Q48 © In case it is decided for assignment of spectrum on administrative basis, what should be the spectrum charging mechanism for assignment of spectrum for i) E band ii) V band iii) MWA carriers iv) MWB carriers separately for each of the following three categories.

Response to Q 29, 31,32 33(iii), 34, 35, 36 and 48.

We are supportive in making the 57-64 GHz and if possible, the 64-71 GHz frequency range available under a licence-exempt regulatory regime without the application of light-licensing.

Q37. In case it is decided to assign spectrum in E-band(71-76/81-86GHz) and V-band (57-64 GHz) on an exclusive basis, should the spectrum be assigned on an LSA basis, or pan-India basis or for any other geographic area should be defined? Kindly justify your response.

The full V-band on a licence-exempt basis should be made available for all users and geographic areas.



Q38. What should be the scope of services/usages for spectrum in E-band (71-76/ 81-86 GHz) and V-band (57-64 GHz) assigned through auction or any other assignment methodology? Kindly justify your response.

For V-band please see our answer to Q23 where we state our preference for a licence-exempt approach to this band. We also believe that under a license-exempt regulatory framework; the scope of services/usages should be left to the discretion of the operator/user. The full V-band on a license- exempt basis should be available for all users.

Q41. In case it is decided to assign spectrum in E-band and V-band through any methodology other than auction, what should be the validity period, process for augmentation/ surrender of carriers, and other terms and conditions? Suggestions may be made with detailed justification.

For V-band please see our answer to Q23 where we state our preference for a licence-exempt approach to this band. We also believe that under a license-exempt regulatory framework, the duration of spectrum access needs to be sufficient to ensure market certainty. This should be at the minimum be 10 years .

Q42. What should be the eligibility conditions and associated conditions for assignment of spectrum in E-band (71-76/81-86 GHz) and V-band (57-64 GHz)? Response may be given for each user category viz. (i) TSPs with Access Service License/ authorization, (ii) TSPs with other than Access Service License/ authorization, and (iii) Other entities (non-TSP, for non-commercial/ captive/ isolated use) with detailed justification.

For V-band please see our response to Q23 where we state our preference for a licence-exempt approach to this band. All users, including original equipment manufacturers (OEM) and start-ups, should have access to the de-licensed band to bring innovative technologies and solutions to the market.

Q43. Whether there is a need to prescribe any roll out obligations for spectrum in E-band and V-band? Should the roll out obligations be linked to the number of carriers assigned to a TSP? Kindly justify your response.

Q44. In case it is decided to prescribe roll out conditions, what should be the roll-out obligations associated with the assignment of spectrum in E-band and V-band? What provisions should be prescribed for non- fulfilment of the prescribed roll-out obligations? Response may kindly be given for each user category viz. (i) TSPs with Access Service License/ Authorization, (ii) TSPs with other than Access Service License/ Authorization, and (iii) Other entities (non-TSP, for non- commercial/ captive/ isolated use) with detailed justification.



For Q43 and Q43.

For V-band please see our response to Q23 where we state our preference for a licence-exempt approach to this band. In a license-exempt, the case of rollout obligations does not arise.

Q45. Whether it is feasible to allow low powered indoor consumer device- to-consumer device usages on license-exempt basis in V-band (57-64 GHz), in parallel to use of the auction acquired spectrum by telecom service providers for establishment of terrestrial and/ or satellite- based telecom networks? If yes, whether it should be permitted? Kindly justify your response.

We are supportive in making the 57-64 GHz and if possible, the 64-71 GHz frequency range available under a licence-exempt regulatory regime without the application of light-licensing. We do not believe that other licensed services should have access to 57-64 GHz but if there is a desire to licence then this should be in the 64-71 GHz band.

V-band is already allowed on license-exempt basis worldwide except for a few countries. We encourage India to align with those countries that do not restrict and licensed the band to enable innovative modern technologies and products in the Indian market. Additionally, the de-licensed band could make possible to replace wired cables with innovative technologies. Some examples of how the band could be used include:

- Contactless ports such as USB3, ethernet, and display ports.¹
- Radar/motion sensing such as palm-sized radars, and in-vehicle children sensors.²
- home security. And,
- health care.

Q46(a) Whether it should be permitted in entire band or part of the band? Kindly provide detailed response including the frequency carriers, which should be considered for license exemption with justification.

We are supportive in making the 57-64 GHz and if possible, the 64-71 GHz frequency range available under a licence-exempt regulatory regime without the application of light-licensing. Full 7 GHz band is required to support contactless ports, device to device data transfer, and motion sensing. A few examples include:

¹ <https://www.molex.com/en-us/products/contactless-connectivity>

² <https://blog.research.google/2020/03/soli-radar-based-perception-and.html>

<https://www.fcc.gov/document/fcc-permits-hot-car-sensors-save-children>

<https://www.federalregister.gov/documents/2023/07/24/2023-15367/fcc-empowers-short-range-radars-in-the-60-ghz-band>"



- Contactless ports: the full band is required to support the extremely high data rates of USB3 and USB4.
- Device to device data transfer: the full band is required to achieve very high data rates to transfer large volumes of data quickly.
- Motion sensing: range resolution is proportional to the spectrum bandwidth and thus, the full band is required to achieve precise sensing.

(b) Whether there is a need to define such indoor use? If yes, what should be the definition for such indoor use?

We believe that there is no need to define "indoor-use" for licence-exempt deployments in the V-band. Indoor use restriction would greatly limit the types of innovative devices allowed on the market and restrict growth.

(c) What technical parameters should be prescribed including EIRP limits? Suggestions may kindly be made with supporting justification and international scenario.

USIBC recommends the use of 57-64GHz - ECC Recommendation 70-03, Annex 1: n1, The European Telecommunications Standards Institute (ETSI) EN 305 550 , 20 dBm avg EIRP and 13 dBm/MHz EIRP PSD, and 57-71GHz - ECC Recommendation 70-03 Annex 3: c1.

Q47. Any other suggestions relevant to assignment of spectrum in E-band (71-76/81-86 GHz) and V-band (57-64 GHz) may kindly be made with detailed justification.

DoT has through its reference letter to TRAI L-14035/10/2022-BWA has acknowledged that the device/chip ecosystem for supporting various technologies for data transfer between consumer devices in the V band has developed and license exempt basis would serve greater public interest and realizing significant socio-economic gains.