02 July 2025

Shri Akhilesh Kumar Trivedi,
Advisor (Networks, Spectrum and Licensing),
Telecom Regulatory Authority of India
Tower F, NBCC World Trade Centre,
Nauroji Nagar,
New Delhi-110029

Subject: Tata Communications Limited's response to TRAI Consultation Paper 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.

Dear Sir,

This is with reference to the TRAI consultation Paper No. 05/2025 dated 03-04-2025 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".**

In this regard, please find enclosed herewith Tata Communication Limited's inputs for your kind consideration as Annexure.

We request you to kindly consider our submissions while finalizing the consultation paper and would be happy to provide any additional information, if required.

Thanking You,

Yours Sincerely,

Alka Selot Asthana
Global Head - Regulatory
Tata Communications Limited

Enclosed: As above

Annexure

Tata Communications Limited's response to TRAI Consultation Paper 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

Tata Communications Limited, a global leader in digital infrastructure and enterprise connectivity solutions, appreciates TRAI's comprehensive consultation on microwave spectrum assignment andexpresses our sincere appreciation to TRAI for the opportunity to provide inputs on the Consultation Paper regarding microwave spectrum assignment across key bands (6 GHz lower, 7 GHz, 13 GHz, 15 GHz, 18 GHz, 21 GHz), E-band, and V-band. The paper's comprehensive approach effectively addresses critical backhaul connectivity requirements while optimizing spectrum utilization for licensed service providers.

The paper includes issues related to Spectrum charges and related terms & conditions such as spectrum cap, carrier aggregation, etc. for assignment of spectrum in 6 GHz (lower), 7GHz, 13 GHz, 15 GHz, 18 GHz, 21 GHz Bands for backhaul purposes of commercial telecom services. Any need for review in respect of use of 7/15 GHz bands in view of consideration of these bands for Access using IMT after WRC - 2027. Quantum/ band(s) of spectrum to be earmarked for (a) last mile connectivity (Fixed Wireless Access) of commercial telecom services and methodology of assignment of spectrum and associated terms & conditions in non-IMT bands (b) backhaul purposes for non-commercial/captive use and associated terms & conditions including charges.

For E&V band, the paper covers issues pertaining to the demand of the spectrum for each of the service/ usage viz. "Backhaul", "Access" and "Integrated Access & Backhaul (IAB), commercial telecommunication services for which the spectrum in E-band and V-band should be assigned for radio backhaul purposes including assignment methodology, quantum of spectrum which should be earmarked for the point-to-point link-based assignment incl. its terms and conditions, need for earmarking certain quantum of spectrum for point-to-point connectivity requirements of captive (non-commercial/ non-TSP) users and how to do assignment, feasibility assessment to allow low power indoor consumer device to-consumer device usages on a license-exempt basis in the V-band in parallel to the use of spectrum by TSP and permitting low power indoor consumer device-to-device usages on a license-exempt basis in the V-band and whether there is need for permitting "outdoor" usages of V-band on a license-exempt basis.

It is our considered submission that Microwave spectrum is equally critical for Enterprise service providers as it enables the high-capacity, low-latency links needed to connect core networks to Enterprises. The growing demand for bandwidth-intensive enterprise applications, cloud services, and IoT deployments has significantly increased the need for robust and scalable solutions. For Enterprise applications purposes[1], radio spectrum is essential requirement for the last mile connectivity, P2P links, private networks and X-haul applications. In order to serve Enterprise customers efficiently, there is need to have sufficient spectrum for ensuring good quality connectivity for various Enterprises to meet their business requirements and digitization of their applications and services.

[1] Enterprise applications such as private 5G, IoT, cloud computing, and Industry 4.0 require low-latency, high-throughput and efficient connectivity.

As a licensed service provider enabling mission-critical communications for enterprises across India, we offer these inputs to ensure spectrum policies align with:

- **Enterprise Digital Transformation** needs,
- **Secure, high capacity backhaul** for cloud, IoT, and Industry 4.0 applications,
- **Competitive neutrality** between access providers and enterprise service providers.

We also recommend that TRAI consider administrative assignment for traditional microwave bands with nominal charges. These should not be subjected to auction. We request TRAI to keep spectrum charges reasonable, delinked from number of uses.

For ensuring competitive neutrality, the inclusive assignment methodologies (e.g., administrative allocation, reasonable charges) are to be adopted which ensure both retail mobile operators and enterprise service providers can access spectrum on fair terms, fostering a level playing field for spectrum usage. Further, it is strongly recommended that the distinction between Access and Backhaul to be maintained. Allocation of Spectrum in these bands should be administrative allocation as defined under the First Schedule of the new Telecommunications Act, 2023.

The TRAI consultation is pivotal in shaping an enterprise-friendly spectrum ecosystem that supports India's digital ambitions. By ensuring fair, flexible, and future-proof spectrum assignment, Government can empower Enterprises to drive innovation, enhance productivity, and contribute to the nation's digital infrastructure growth.

With the above submissions, we are hereby providing our comments / inputs on the issues raised in the Consultation Paper:

Q1. What is the level of demand of the spectrum in the traditional microwave backhaul bands [viz. 6 GHz (lower), 7 GHz, 13 GHz, 15 GHz, 18 GHz, and 21 GHz bands] for radio backhaul purposes? Kindly provide a detailed response with justifications.

Tata Communications Response:

- Spectrum is vital for Enterprise service providers, as it underpins the high-capacity, low-latency links required to connect core networks to various enterprises. The escalating demand for bandwidth-intensive applications, cloud services, and IoT deployments has made robust and scalable solutions indispensable. For enterprise use cases, radio spectrum is essential for last-mile connectivity, P2P links, private networks and X-haul applications to ensure reliable, high-quality connectivity that meets the evolving business and digitization needs of enterprise customers. Radio spectrum-based connectivity supplements and complements the optical fibre-based connectivity.
- The present licensing and regulatory framework has evolved from a retail perspective be it mobility services and/or broadband services. For Enterprise services, being on a different pedestal there is a need to have different standards in various aspects of service provision and the same needs to be addressed by taking measures including making available spectrum for enterprise services and B2B market. The range of services offered to and required by the Enterprises are distinct from the retail access services, thus, the requirement of usage of spectrum is different for B2B and B2C telecom market.
- Current terms and conditions related to spectrum assignment by way of auction such as large quantum of spectrum, extensive rollout obligation and high reserve prices are set from the retail uses perspective thus, making un-viable for Enterprise telecom service providers to participate in the auctions. Moreover, existing spectrum trading and sharing

guidelines are only applicable to Access Service Providers and there are no spectrum leasing guidelines for B2B providers. There is no dedicated licensed band spectrum available earmarked for Enterprise Service Providers to meet the exponentially growing connectivity requirements of Enterprise customers. Fiber connectivity is a major challenge in most locations due to complex and time-consuming RoW permission process and exorbitantly high RoW charges in addition to the physical deployment challenges in densely populated or remote areas. There is no provision for allocation of x-haul spectrum to enterprise service providers in appropriate band. This restrictive spectrum framework leads to several business challenges for Enterprise Service Providers in meeting the connectivity requirements of Enterprises leading to poor Industry 4.0 adoption.

- The spectrum has always been seen as a means for connectivity to retail mobile user/ end user as last mile. The term last mile is commonly used for the spectrum utilised by the retail users. The end users' traffic is aggregated at BTSs and then backhauling to the core network. On the other hand, enterprises increasingly require ultra-reliable, high-bandwidth connectivity "Enterprise Backhaul[2]" for Industry 4.0, IoT, cloud services, private networks, and real-time applications which can only be served from High-capacity spectrum for fiber-like speeds.
- Tata Communications being an Enterprise Service provider is required to deliver services to its Enterprise Customers' premises / locations, remote locations, and hybrid networks as per their business requirements which is not feasible at all the times in terms of technical feasibility to access customer location(s) or areas where availability of fixed line connectivity (e.g. Fiber) is a challenge due to difficulty of laying and exorbitantly higher RoW cost.
- Tata Communications being an ISP licensee was administratively allocated spectrum in 3.3-3.6 GHz band which was used to provide services to Enterprise Customers since 2006 and had to be vacated at the behest of DoT in January 2020 for IMT/5G services. After this surrender, replacement spectrum has not been provided. In our understanding, Enterprise business is a different segment and cannot be clubbed with the retail access services. The last mile connectivity for Enterprises has a different connotation vis-à-vis access retail user / access service and refers to the Enterprise connectivity of its premises to the service provider's local infrastructure or point of presence (PoP) using X-haul network. The connectivity can be delivered via various options like fiber optic cables, copper wires, coaxial cables, or wireless (microwave, radio or LTE) links or satellite links.
- Tata Communications is of the view that the MWA (13/15/18/21 GHz) / MWB (7 GHz) spectrum is also required by TSPs having authorizations other than Access Service, and other entities (non-TSP, for non-commercial/captive/ isolated use). Therefore, assignment of MWA/ MWB spectrum would also be made to TSPs having authorizations other than Access Service License/ authorization administratively as has been provided to TSPs having Access Service License/ authorization in line with the First Schedule of the Telecommunications Act, 2023 for optimal spectrum reuse, scalability, and efficiency. The MWA and MWB spectrum band should be assigned for Point-to-Point (P2P) links on administrative allocation on PAN India basis with minimum two numbers of 28MHz FDD paired channels. The administrative assignment should be done in accordance with the First Schedule of the Telecommunications Act, 2023.

[2] Enterprise backhaul connects a business's premises directly to the service provider's local infrastructure or point of presence (PoP) using backhaul network for combining front haul signals/ traffic to carry it to another PoP. The last mile can be delivered via various backhaul options like fiber optic cables, copper wires, coaxial cables, or wireless (microwave, radio or LTE) links.

- The availability of spectrum in these microwave bands is also essential for ensuring reliable, high-throughput backhaul to serve enterprise locations and high-value business parks. Therefore, assignment of MWA/ MWB spectrum would also be made to TSPs having authorizations other than Access Service License/ authorization administratively as has been provided to TSPs having Access Service License/ authorization.
- We also wish to express our sincere gratitude to the Department of Telecommunications, Government of India's progressive decision to open the lower 6 GHz band (5925–6425 MHz) for unlicensed use and for providing us with the opportunity to share our comments and feedback on the Draft Rules on the Use of Low Power and Very Low Power Wireless Access Systems including Radio Local Area Network in the Lower 6 GHz Band (Exemption from Licensing Requirements) Rules, 2025. This step will encourage further innovation and growth in the telecommunications sector. However, we will request TRAI to kindly recommend to DoT that the lower 6 GHz Band should be extended as 5.925GHz - 7.125GHz in accordance with the global standards and spectrum Regulations for unlicensed use considering the fact that the lower 6 GHz band is being widely adopted for unlicensed use to support public Wi-Fi, enterprise wireless LANs, and smart homes/offices.
- The unlicensed use of this band enables cost-effective broadband access, promotes digital inclusion, and supports innovation without the burden of spectrum fees. Further, DoT in its draft Rules has recommended the outdoor power limit of 14 dBm (25 mW) which is highly restrictive and will significantly constrain the ability to fully leverage the transformative potential of this band, especially in the context of next-generation Wi-Fi technologies such as Wi-Fi 6E and Wi-Fi 7. The 6 GHz band offers a cleaner spectrum, but low EIRP limits (14 dBm) negate its potential. To unlock the 6 GHz band's full potential for enterprises, addressing spectrum scarcity, interference, and coverage challenges, while ensuring responsible spectrum sharing, we recommend to adopt the following power limits in line with with global norms and leveraging AFC technology and in alignment with power permitted in 5 GHz band, for its outdoor application use:
    i. 36 dBm EIRP for Point-to-Multipoint (P2MP)
    ii. 53 dBm EIRP for Point-to-Point (P2P)
- It is also submitted that considering increasing connectivity requirements of Enterprises as a part of their digital transformation journey, there is an immense need to explore possibilities for opening the higher backhaul spectrum bands (W and D bands) to deliver ultra-high-capacity, low-latency wireless backhaul for advanced enterprise applications. These bands offer much wider channel bandwidths than conventional microwave frequencies, enabling multi-gigabit throughput over short to medium distances.

Q2. For which commercial telecommunication services should the spectrum in traditional microwave backhaul bands be assigned for radio backhaul purposes? Kindly provide a detailed response with justifications.

Tata Communications Response:

- In our view, following commercial telecommunications services should also be assigned spectrum in traditional microwave bands for radio X-haul purposes:
    - Fixed Wireless Access (FWA).
    - Enterprise connectivity (dedicated access).
    - Remote site connectivity.
    - Redundant network paths in hybrid networks (fiber + wireless).

    - Support for emerging enterprise use cases such as SD-WAN, IoT, and smart infrastructure.
    - Private Network traffic backhauling
- Notably, Fixed Wireless Access (FWA) is gaining prominence as a viable alternative to fiber in suburban and rural regions, owing to its faster rollout and greater cost efficiency. In these deployments, microwave backhaul plays a critical role in connecting FWA base stations to the core network, particularly in areas lacking feasible fiber infrastructure
- Similarly, Enterprise and B2B connectivity, particularly within industrial campuses and Special Economic Zones (SEZs) often demands customized, high-capacity data solutions. In such scenarios, telecom operators and service providers frequently rely on microwave links to deliver dedicated leased lines, establish redundancy paths, and facilitate intra-campus connectivity, especially where fiber deployment is impractical.
- The 6 GHz band also supports wider channels (up to 160 MHz), which are essential for delivering multi-gigabit speeds and supporting next-generation Wi-Fi technologies like Wi-Fi 6E and Wi-Fi 7. The advancement of technology in Wi-Fi Wi-Fi i.e. 6E (IEEE 802.11ax) and Wi-Fi 7 (IEEE 802.11be, when combined with interference-free spectrum access in the lower 6 GHz band with sufficient outdoor power, make Wi-Fi 6E and 7 ideally suited not only for indoor networks but also for outdoor broadband expansion, particularly in underserved rural areas aligned with BharatNet goals. Outdoor use-cases for this band are broad and growing rapidly, including:
    - High-speed public Wi-Fi in urban, rural, and hotspot zones including PM-WANI
    - Wi-Fi as last mile by ISPs to expand broadband coverage
    - AR/VR deployment in public spaces
    - Outdoor autonomous systems (e.g., drones, robots, driverless vehicles)
    - Wireless outdoor backhaul (building-to-building, node-to-node) that can significantly accelerate broadband rollouts, particularly where laying fibre is difficult or expensive

  Higher power limits ensure that wider channels maintain strong signal strength over greater distances, maximizing throughput and capacity. Therefore, to unlock the 6 GHz band's full potential for enterprises, addressing spectrum scarcity, interference, and coverage challenges, while ensuring responsible spectrum sharing, we recommend to adopt the power limits as suggested in our response to Q 1 for outdoor applications in line with global norms and leveraging AFC technology.

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.

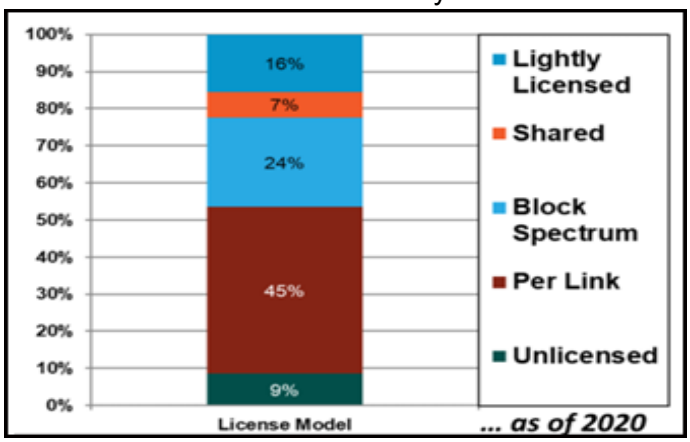
And

Q4. In case it is decided to use different methods (block-based, linkbased, or any other) for the assignment of the spectrum in traditional microwave backhaul bands for radio backhaul purposes for different types of commercial telecommunication services, what quantum of spectrum, and in which of 6 GHz (lower), 7 GHz, 13 GHz, 15 GHz, 18 GHz, and 21 GHz bands should be earmarked for point- to-point link-based assignments? Kindly provide a detailed response with justifications.

Tata Communications Response to Q3 & Q4:

Tata Communications recommends Point-to-Point administrative assignment method of spectrum in traditional microwave backhaul bands:

- Point-to-Point (P2P) link-based assignment is the most efficient and scalable approach for non-Access service license holders (such as ISPs and NLDOs) given their national license scope. The P2P links allow precise, need-based deployment, encourage spectrum reuse, and minimize underutilization, especially where operators only require selective deployment rather than contiguous coverage.
- As per ABI Research[3] currently the most popular method for PTP networks, accounting for about 45% of the countries surveyed.



- For TSPs other than access service license, the mentioned traditional microwave backhaul bands (7/13/15/18/21 GHz) should be assigned for Point-to-Point (P2P) links on administrative allocation on PAN India basis with minimum two numbers of 28MHz FDD paired channels to meet their customers' requirements.

Q5. What should be the terms and conditions for the assignment of spectrum in traditional microwave backhaul bands for radio backhaul purposes of various commercial telecommunication services, such as –

(a) Carrier size;

(b) Carrier aggregation;

(c) Validity period of the assignment;

(d) Renewal mechanism;

(e) Roll-out obligations; and

(f) Surrender of spectrum etc.?

Kindly provide a detailed response with justifications. along with the international scenario on the matter.

Tata Communications Response:

- The present licensing and regulatory framework has evolved from a retail perspective be it mobility services and/or broadband services and is more suited to B2C telecom

[3] https://www.gsma.com/connectivity-for-good/spectrum/wp-content/uploads/2022/04/wireless-backhaul-spectrum.pdf

businesses. For Enterprise services, being on a different pedestal there is a need to have different standards in various aspects of service provision and the same needs to be addressed by taking measures including making available spectrum for enterprise services and B2B market. The range of services offered to and required by the Enterprises are distinct from the retail access services, thus, the requirement of usage of spectrum is different for B2B and B2C telecom market.

- Current terms and conditions related to spectrum assignment by way of auction such as large quantum of spectrum, extensive rollout obligation and high reserve prices for spectrum put up in the auction from retail uses perspective thus, making un-viable for Enterprise telecom service providers to participate in the auctions. Moreover, existing spectrum trading and sharing guidelines are only applicable to Access Service Providers and there are no spectrum leasing guidelines for B2B providers. Further, there is no dedicated licensed band spectrum earmarked currently for Enterprise Service Providers to meet the exponentially growing connectivity requirements of Enterprise customers.
- Spectrum in MWA & MWB band should be assigned administratively to ensure efficient utilization of the spectrum resource and only on non-exclusive basis to all TSPs with other than Access Service License/Authorization including category 'A' ISPs, NLDOs at Pan India basis as these licensees has National area licenses.
- The validity period of the MWA/ MWB Carrier assignment should provide sufficient timeframe to allow licensees to make the necessary investments, innovations & optimize networks. Therefore, a validity period of 15-20 years annual renewal would be appropriate.
- The option of surrendering the spectrum should also be provided in the administrative allocation framework. The TSPs should be able to surrender the spectrum after five years of the assignment and thereafter annual review of usage of such spectrum may be done with an option of surrender spectrum after every two years till the validity period. The mechanism of surrender and return of Bank Guarantees etc. should be made smooth and easy.
- There is no requirement to prescribe any roll out obligations for MWA/MWB carrier assignment considering administrative allocation of the spectrum as per need basis only. The administrative allocation of spectrum gives flexibility to the regulator to allocate spectrum to operators only on need basis for deployment of the MWA and MWB networks only in geographies with specific business needs of the respective TSPs other than access service license. Moreover, Service providers like Tata Communications who is catering the needs of B2B segment and use of such spectrum is entirely dependent upon business requirements, hence there is no case for prescribing any rollout obligation.
- The carrier size for MWA and MWB band carriers should be paired 28 MHz (FDD) to meet the fair allocation of spectrum resource to both the categories (TSPs with access service license/TSPs other than access service license).
- ITU Traditional Microwave Frequencies - These are the most widely used microwave bands globally today and will continue to be very important in the coming years. The introduction of wider channels (28 MHz to 56 MHz and eventually toward 112 MHz to 224 MHz) has started, which, together with new spectrum-efficient technologies
- In view of above submissions, Tata Communications recommends a well-structured and harmonized regulatory framework including following terms and conditions:

Sno.	**Parameter**	**Tata Communications' Aligned View**
(a)	**Carrier Size**	Paired 28 MHz FDD per link, PAN India basis

(b)	**Carrier Aggregation**	It should be allowed where spectrum availability permits, to enable high-capacity links.
(c)	**Validity Period**	15–20 years with annual renewal option
(d)	**Renewal Mechanism**	Annual self-declaration-based renewal, with usage review and option to surrender
(e)	**Roll-out Obligations**	No obligations for P2P links; roll out should be Enterprise usage driven
(f)	**Surrender**	Permissible post 5 years

- Globally[4], Regulators (such as FCC in the USA, Ofcom in the UK, and ACMA in Australia) have adopted flexible, technology-neutral, and scalable policies for backhaul spectrum assignment. These policies emphasize key parameters such as adaptive carrier sizing, renewable license tenures, light licensing models in high-frequency bands.

Q6. Is there a need to prescribe ceilings on the number of carriers that can be assigned to a commercial telecommunication service provider in each frequency band [6 GHz (lower)/ 7 GHz/ 13 GHz/ 15 GHz/ 18 GHz/ 21 GHz] or in a group of frequency bands for radio backhaul purposes? Kindly provide a detailed response with justifications.

Tata Communications Response:

We do not recommend any ceiling on number of microwave carriers that can be held by a licensee as this spectrum will be shared across the LSA by multiple number of Users and there will not be any exclusive assignment of the same. However, for TSPs having access service authorisation, further assignment of spectrum in the new bands should be done only after usage validation of their existing allocated carriers.

Q7. In case it is decided to prescribe ceilings on the number of carriers that can be assigned to a commercial telecommunication service provider (TSP) for each frequency band or each group of frequency bands, -

(a) Should there be any criterion for the ceiling on the number of carriers that may be assigned to a TSP? If yes, what should be the criteria?

(b) In case of group of frequency bands, how should the bands be grouped?

(c) What should be the respective ceilings for each frequency band, or each group of frequency band(s)?

(d) Should there be any provision for assignment of spectrum above the ceiling limit on a case-by-case basis? If yes, what criterion should be prescribed, based on which, additional spectrum above the ceiling limit may be assigned to a telecom service provider?

Kindly provide a detailed response with justifications.

Tata Communications Response:

Not applicable in view our response to Q6 above.

[4] https://ised-isde.canada.ca/site/spectrum-management-telecommunications/en/official-publications/policies/spectrum-utilization-policies-sp/decisions-spectrum-utilization-policies-and-technical-requirements-related-backhaul, https://www.gsma.com/connectivity-for-good/spectrum/wp-content/uploads/2022/01/wireless-backhaul-spectrum-positions-v2.pdf and https://www.ecfr.gov/current/title-47/chapter-I/subchapter-D/part-101/subpart-C/section-101.147

Q8. In the new policy regime for the assignment of spectrum, whether there is a need to grant an option to telecom service providers already holding carriers in traditional microwave backhaul bands to retain the existing carriers with them? Kindly provide a detailed response with justifications.

Tata Communications Response:

- It is recommended that under the new policy regime, particularly for TSPs other than access service license, the mentioned traditional microwave bands (7/13/15/18/21 GHz) should be assigned for Point-to-Point (P2P) links on administrative allocation on PAN India basis with minimum two numbers of 28MHz FDD paired channels to meet their customers' requirements, which do not need ubiquitous coverage.
- For TSPs having access service authorisation, further assignment of spectrum in the new bands should be done only after usage validation of their existing allocated carriers.
- Surrender of spectrum carriers should be made smooth and time bound. License may undertake assessment from time to time to ascertain the utilization.

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 WRC27, 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.

And

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.

Tata Communications Response to Q9 and Q10:

- Based on the technical and regulatory considerations for the 7 GHz (7125-8400 MHz) and 15 GHz (14.8-15.35 GHz) microwave backhaul bands in light of their potential reallocation for IMT (International Mobile Telecommunications) at WRC-27, a balanced approach is recommended as follows:
    - Since WRC-27 outcomes will determine global harmonization of these bands for IMT, influencing equipment standards, interference thresholds, and coexistence frameworks, hence it is requested to defer any major regulatory reviews until post-WRC-27 considering the fact that the microwave backhaul networks remain critical for rural/remote connectivity where fiber is impractical.
    - TRAI should recommend to DoT for initiation of preparatory coexistence studies to model interference scenarios between IMT and incumbent microwave systems, ensuring evidence-based policy post-WRC-27
    - Stakeholder consultations (e.g., telcos, equipment vendors, regulators) to assess the technical feasibility of spectrum sharing, migration pathways for existing backhaul links and cost implications for network upgrades.
    - Strategic alignment with global standards also needs to be ensured.
- Further, it also recommended that there should be a provision to assign the mentioned traditional microwave bands (7/15 GHz) to TSPs other than access service licensees on a Point-to-Point (P2P) link basis. Administrative allocation on PAN India basis with minimum two numbers of 28MHz FDD paired channels is essential to meet Enterprise customers' requirements.

Q11. Whether there is a need to earmark certain quantum of spectrum in traditional microwave backhaul bands for the last-mile connectivity (Fixed Wireless Access) to the customer equipment of commercial telecommunication services? Please provide a detailed response with justifications.

Tata Communications Response:

- Yes, there is a critical need to earmark certain quantum of spectrum in traditional microwave backhaul bands for the last-mile connectivity (Fixed Wireless Access) to the customer equipment of commercial telecommunication services. This approach addresses India's growing demand for high-speed broadband, bridges the urban-rural digital divide, and optimizes spectrum utility while maintaining backhaul efficiency.
- Spectrum for X-haul is a supplement / complement to fiber and copper connectivity. Further opening of satellite services is leading towards technology agnostic and medium agnostic connectivity demand for high speeds.
- The assignment criteria for allocation of additional carries for Microwave bands should be on need-basis, after examining full justification of the requirements and availability of spectrum and upon taking into consideration spectrum requirement of other users with a view to ensuring electromagnetic compatibility etc.
- The non-access service providers lack administrative allocation of spectrum for X-haul disadvantaging them against access service providers who hold spectrum and can further obtain, trade and share. Earmarking spectrum for FWA would enable ISPs to serve enterprise customers with reliable, SLA-compliant connectivity and also prevent the customer churn due to QoS degradation from suboptimal unlicensed-band solutions (e.g., UBR).
- Also, traditional microwave bands (e.g., 7 GHz, 15 GHz) offer lower propagation loss compared to E/V bands, making them ideal for FWA in non-line-of-sight scenarios. Example: 7 GHz band provides longer range and better penetration through obstacles, reducing infrastructure costs thereby ensuring optimal spectral and economic efficiency.
- Globally, SATRC countries[5] use microwave bands for FWA to achieve cost savings of 40–60% vs. fiber in difficult terrains.

Q12. In case it is decided to earmark certain quantum of spectrum in traditional microwave backhaul bands for the last-mile connectivity (Fixed Wireless Access) to the customer equipment of commercial telecommunication services, -

(a) What quantum of spectrum, and in which of 6 GHz (lower), 7 GHz, 13 GHz, 15 GHz, 18 GHz, and 21 GHz bands should be earmarked for such purposes?

(b) What should be the eligibility conditions to obtain the spectrum in traditional microwave backhaul bands for such purposes?

(c) What should be the terms and conditions for the assignment of spectrum in traditional microwave backhaul bands for such purposes through auction such as-

(i) Block size; (ii) Minimum quantity for bidding; (iii) Spectrum cap; (iv) Validity period of the assignment; (v) Roll-out obligations; (vi) Surrender of spectrum etc.?

(d) Whether flexible use i.e., both backhaul connectivity, and last mile connectivity (fixed wireless access) to the customer equipment should be permitted in the frequency

[5] https://apt.int/sites/default/files/SATRC-SAPVI-08_Microwave_Backhaul_report.docx

ranges earmarked for such purposes? If yes, should the terms and conditions of the auction of spectrum be the same as those applicable for the "access spectrum"?

Kindly provide a detailed response with justification and international practice.

Tata Communications Response:

- It is submitted that TRAI should recommend reserving 50-100 MHz per operator (access and non-access service provider) in sub-15 GHz bands (prioritizing 7 GHz, 13 GHz) for FWA and allocation of the same should done administratively.
- All licensed service providers should be eligible to obtain the spectrum in traditional microwave bands for X-haul purposes.
- There should not be any rollout obligation for deployment of such spectrum for Enterprise use cases.
- No threshold limit in terms of number of links should be prescribed for the TSPs with other than Access Service License/ Authorization under existing P2P assignment of MWA/MWB carriers as same is being shared among multiple Service Providers and considering their simultaneous usage along with Geospatial separation assumptions. The threshold should be imposed only for spectrum assigned through auction for exclusive uses.

Q13. Should a certain quantum of the spectrum in traditional microwave backhaul bands be earmarked for fulfilling point-to-point connectivity requirements of captive (non-commercial/ non-TSP) users? If yes –

(a) What quantum of spectrum, and in which of 6 GHz (lower), 7 GHz, 13 GHz, 15 GHz, 18 GHz, and 21 GHz bands should be earmarked for such purposes?

(b) What should be the terms and conditions for the assignment of spectrum for such purposes, such as-

(i) Carrier size; (ii) Carrier aggregation; (iii) Ceiling on the number of carriers; (iv) Validity period of the assignment; (v) Renewal mechanism; (vi) Criteria for the assignment of additional spectrum above the ceiling limit; (vii) Roll out obligations; and (viii) Surrender of the spectrum, etc.?

Kindly provide a detailed response with justifications.

Tata Communications Response:

- Yes, a certain quantum of spectrum in traditional microwave backhaul bands should be earmarked for captive (non-commercial/non-TSP) users, with clear policy, eligibility, and assignment mechanisms. This should be done via administrative assignment, with periodic review and robust monitoring to ensure optimal and equitable use of this valuable resource.
- Further, we wish to reiterate that for TSPs other than access service license and other certain user categories MWA and MWB band should be assigned for Point-to-Point (P2P) links on administrative allocation on PAN India basis with minimum two numbers of 28MHz FDD paired channels to meet their business requirements which do not need ubiquitous coverage.
- For TSPs with other than Access Service License/ Authorization, in our view, there should not be any condition prescribed for assignment of spectrum in 6/ 7/ 13/ 15/ 18/ 21 GHz bands and allocation of same should be market driven considering following factors -
    - Size of network
    - Net worth

- Pan India presence
- Number of customers to be served using such spectrum.
- No rollout obligation to be made applicable considering Point-to-Point (P2P) link on administrative allocation at pan India basis.

Q14. In case your response to Q13 is 'no', in what manner should the point-to-point connectivity requirements of captive (non-commercial/ non-TSP) users be fulfilled? Kindly provide a detailed response with justifications.

Tata Communications Response:

Not applicable in view of response provided in Q13

Q15. In case it is decided to assign the spectrum in traditional microwave backhaul bands on a point-to-point link basis to cater to point-to-point connectivity requirements of commercial telecommunication service providers as well as captive (non-commercial/ Non-TSP) users, whether there is a need to prescribe minimum link lengths (path lengths) in these bands? If yes, what should be the minimum link length for each of the traditional microwave backhaul bands? Kindly provide a detailed response with justifications.

Tata Communications Response:

- In our view minimum path lengths should not be mandated uniformly across all bands.
- Based on point-to-point use cases it should be leave upon the service providers for their respective network application and services.
- Mandating minimum link lengths may hinder network flexibility and usage of spectrum particularly for dense enterprise environments.

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.

Tata Communications Response:

- Since the unlicensed use of this band enables cost-effective broadband access, promotes digital inclusion, and supports innovation without the burden of spectrum fees. Therefore, the lower 6 GHz Band should be extended as 5.925GHz -7.125GHz in accordance with the global standards and spectrum Regulations for unlicensed use considering the fact that the lower 6 GHz band is being widely adopted for unlicensed use to support public Wi-Fi, enterprise wireless LANs, and smart homes/offices.
- Further, DoT in its draft Rules has recommended the outdoor power limit of 14 dBm (25 mW) which is highly restrictive and will significantly constrain the ability to fully leverage the transformative potential of this band, especially in the context of next-generation Wi-Fi technologies such as Wi-Fi 6E and Wi-Fi 7. The 6 GHz band offers a cleaner spectrum, but low EIRP limits (14 dBm) negate its potential. Therefore, to unlock the 6 GHz band's full potential for enterprises, addressing spectrum scarcity, interference, and coverage challenges, while ensuring responsible spectrum sharing, we recommend to adopt the following power limits in line with with global norms and leveraging AFC technology and in alignment with power permitted in 5 GHz band, for its outdoor application use:

- i. 36 dBm EIRP for Point-to-Multipoint (P2MP)
- ii. 53 dBm EIRP for Point-to-Point (P2P):

- Mitigation of Interference Risks**:** AFC Systems: As implemented in the U.S., AFC ensures higher-power devices (36 dBm) avoid interference with incumbent services (e.g., satellite links). India can adopt similar dynamic spectrum management to enable safe operation. Further, technical safeguards can be implemented such as
  - enforcing strict thresholds (e.g., -27 dBm/MHz) to protect adjacent bands by implementing out-of-Band Emission Limits and
  - geofencing: Restrict high-power use near sensitive sites (e.g., airports, oil platforms).

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.

Tata Communications Response:

We would like to submit the following:

- Traditional Microwave bands are natural resources and do not need any upfront investment to make them available for use. Therefore, apart from administrative charges, no upfront charges should be levied on their administrative assignment to TSPs / Other entities.
- Administrative allocation of MWA/MWB spectrum to non-access players is essential to preserve enterprise service continuity.
- Implement real time spectrum management systems to facilitate dynamic assignment and coordination of P2P links at a national level.
- Annual spectrum charges for MWA and MWB carriers should be levied on “link-by-link” basis.
- For a TSP procuring MWA/MWB under the captive category, an AGR based model is justified only if the annual spectrum charges are applied to AGR directly arising from the use of microwave spectrum, i.e. excluding any AGR arising as a result of use of any other media.

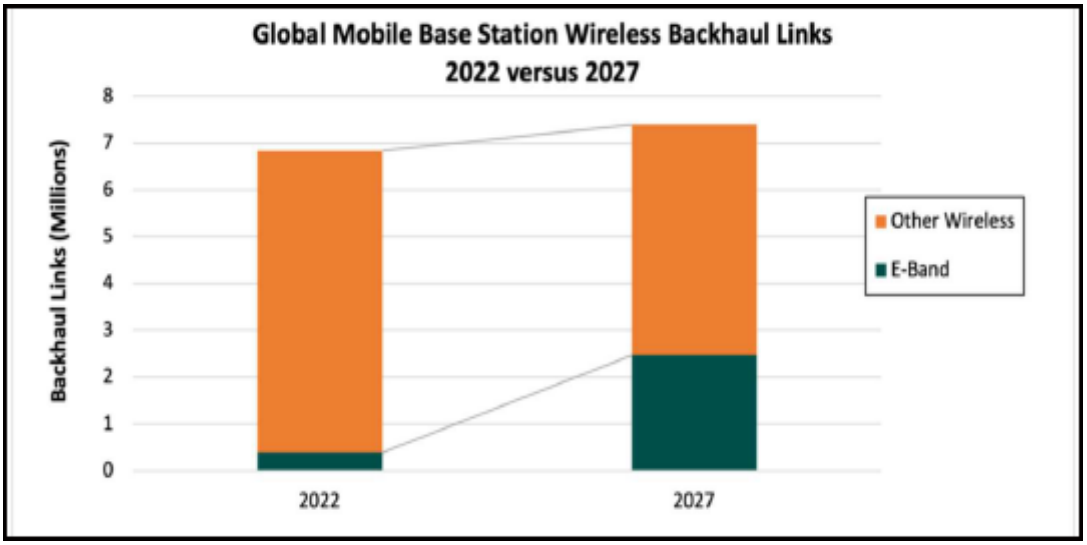
Q18. What is the level of demand of the spectrum in the E-band (71-76 GHz, and 81-86 GHz) for each of the service/ usage viz. “Backhaul”, “Access” and “Integrated Access & Backhaul (IAB)”? Kindly provide a detailed response in respect of each service/ usage with justification including availability of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

Tata Communications Response:

- The E &V Band spectrum has the ability to deliver higher bandwidths and can be deployed for last mile connectivity and backhaul applications, high-capacity P2P links and Private Networks. Therefore, it is recommended that the E-band be lightly licensed and made available to all licensed service providers.
- Worldwide, there is strong demand and future potential for E-band spectrum across following services/usage:
  - X-khaul: To support high-capacity enterprise links, 5G small cells, and FWA
  - Access: For short-range enterprise applications

Band	Frequency range
E-band	71-76 GHz, and 81-86 GHz
V-band	The V-band is generally referred to as the 57-64 GHz range. The extended V-band is considered to be the 57-66 GHz range.

- According to ABI Research, E-band links are expected to grow to over 2.5 million in the year 2027, making up 33% of total wireless backhaul links. A comparison[6] of Wireless Backhaul Links in 2022 Vs 2027 is as under:



The ecosystem is mature with standardized 3GPP specs, available radio equipment, and growing deployments globally (e.g., USA, Brazil, Korea). Prominently, existing enterprise offerings will directly benefit from E-band P2P deployments.

- E-Band frequencies have several unique characteristics not experienced by conventional lower frequency radio systems. At high E-band frequencies, antennas are highly directional, with systems communicating point-to-point via highly focused “pencil beam” transmissions. Thus, interference concerns are greatly reduced, and frequency reuse is promoted. Propagation limitations, particularly rain fading, limit high frequency links to relatively short-range distances (a few kilometers). This would result in greater frequency reuse and easier path planning.
- For E-Band spectrum, we recommend using the lightly licensed administrative methodology for assignment of E-band (71-76/81-86 GHz) as per global practice (please refer table below)

E-band: Country-wise License Regime & Administrative Fees, Source: *ETSI’s Database (*European Telecommunications Standards Institute)					
Country	Freq. Band [GHz]	Status of the band	FDD/TDD	License Regime	License Cost Estimation for 250MHz/Year [Euro]
USA	71-76;81-86	Open	FDD/TDD	Light licensing	100
Australia	71-76;81-86	Open	FDD/TDD	Light	2240

[6] https://www.rcrwireless.com/20230807/5g/the-use-of-e-band-for-backhaul-a-key-ingredient-for-successful-5g-beyond-analyst-angle

				licensing	
Brazil		Open		Light licensing	950
Canada		Open	FDD/TDD	Licensed	240
Greece	71-76;81-86	Open	FDD/TDD	Link by link	230
Indonesia	71-76;81-86	Open		Light licensing	2360
Turkey	71-76;81-86	Open		Link by link	1600
Italy	71-76;81-86	Open	FDD	Link by link	2800
South Korea	71-76;81-86	Open	FDD/TDD	Light licensing	190
New Zealand	71-76;81-86	Open	FDD/TDD	Link by link	115
Iraq		Open		Link by link and Block	3600
Russia	71-76;81-86	Open	FDD/TDD	Unlicensed	-
Saudi Arabia		Open		Link by link	8083
Malaysia	71-76;81-86	Open	FDD/TDD	Link by link	1000
Nigeria	71-74;81-84	Open			50
Finland	71-76;81-86	Open	FDD		35

- Tata Communications recommends adopting the FDD allocation of E-band spectrum in India considering the usage for BH application, global adoption and ecosystem availability.
- The E-band (71-76/ 81-86 GHz) spectrum can be used to support a wide range of services and applications. These bands are well-suited for a variety of services like:
    - High-speed backhauls.
    - Point-to-point links to extend network coverage to specific geographies with business potential.
    - E-band spectrum should also be allowed to be used for a variety of innovative and emerging applications. Regulators must keep the options open for any relevant applications on the band.
    - E & V Band spectrum can also be used for extending coverage for captive non-public networks where fiber deployment is a constraint. Examples include mines, remote area ports, Agriculture areas etc.

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.

Tata Communications Response:

- The V-Band (57-64 GHz) should be delicensed due to the limited propagation characteristics of the band in line with global practices due the limited propagation characteristics of the band. V-Band has the highest oxygen absorption and therefore atmospheric loss and higher rain loss render these frequencies unsuitable for long distance transmission. With “best effort” connectivity, systems can transmit up to a few

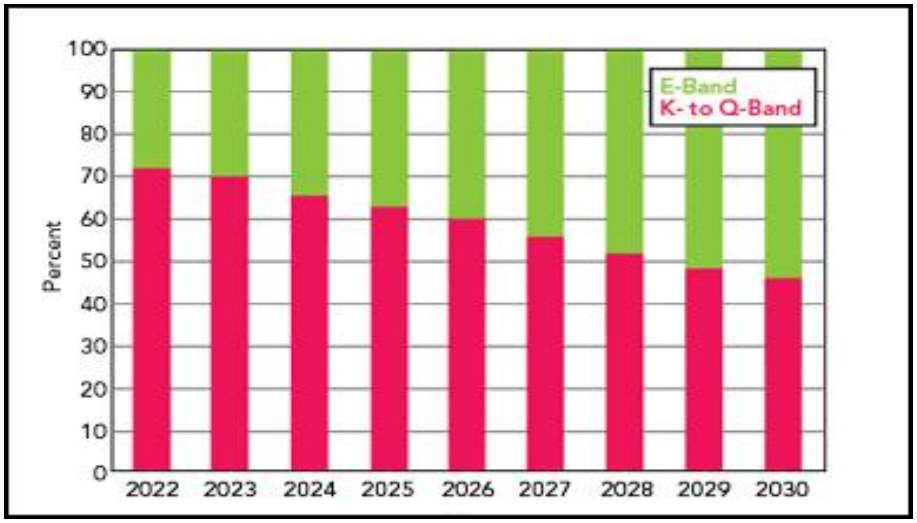
hundred meters only. Hence, many administrations do not license this band. For the V-band spectrum, the specific applications are still under evolution for use in short ranges, indoor etc. TRAI in its recommendations must keep the options open for any relevant applications in this band.

- Additionally, V band is unlicensed in Europe, Australia, Canada, Japan, Republic of Korea and the United States due to limited propagation characteristics of the band, hence it is proposed to de-license the V-band (57-64 GHz) according to global practice. Pls refer below table for country wise status of V-Band –

V-Band Country-wise status (60 GHz) Source: *BIF White Paper (*Broadband India Forum)	
Country	V Band Status
USA	License-Exempt
UK	License-Exempt
Switzerland	License-Exempt
South Africa	License-Exempt
Spain	License-Exempt
Slovakia	License-Exempt
Singapore	License-Exempt
Poland	License-Exempt
Philippines	License-Exempt
New Zealand	License-Exempt
Malesia	License-Exempt
Korea	License-Exempt
Japan	License-Exempt
China	License-Exempt
Canada	License-Exempt
Brazil	License-Exempt
Belgium	License-Exempt
Austria	License-Exempt
Australia	License-Exempt

- Tata Communications recommends adopting the TDD mode of operation for unlicensed use of V-band spectrum in India considering global adoption and ecosystem availability.
- There is significant interest in using V-band for:
    - Short-range access and last-mile wireless links
    - Wi-Fi 6E and 7-based indoor enterprise deployments
- Analysis of global adoption of various bands for X-haul[7]

[7] https://www.microwavejournal.com/articles/40630-v-band-and-e-band-radio-links-are-becoming-important-for-5g-fixed-wireless-access-and-xhaul



- It is also important to mention that the 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.
- Further, for any delicensed band any restrictions of applications must not be allowed, and regulator must allow TSPs to use the spectrum as per their business needs and allow new innovative applications, including low power indoor applications to evolve.

Q20. For which commercial telecommunication services should the spectrum in E-band and V-band be assigned for radio backhaul purposes? Responses with detailed justifications may kindly be provided for E-band and V-band separately.

Tata Communications Response:

- Tata Communications is of the view that the E & V Band spectrums which has the ability to deliver higher bandwidths and can be deployed for last mile connectivity and backhaul applications, high-capacity P2P links and Private Networks.

Band	Application/services
E-band	Enterprise X-haul
V-band	Very short-range application

- The carrier size in E-band (71-76/81-86 GHz) should be 250 MHz allocated to TSPs other than Access Service License/ Authorization.
- We recommend using the lightly licensed administrative methodology for assignment of E-band (71-76/81-86 GHz) as per global practice (Australia, Brazil, Indonesia, S. Korea etc.) to TSPs with other than access service license/authorization.
- The administrative allocation of spectrum gives flexibility to the regulator to allocate spectrum to operators only on need basis for deployment of networks only in geographies with specific business needs of the respective TSPs other than access service license.
- We also recommend that E-Band should be exempted from any rollout obligation considering administrative allocation of the spectrum as per need basis only.
- Additionally, V band is unlicensed in Europe, Australia, Canada, Japan, Republic of Korea and the United States due to limited propagation characteristics of the band, hence it is proposed to de-license the V-band (57-64 GHz) according to global practice.

Q21. Which of the following methods should be used for the assignment of the spectrum in E-band and V-band for radio backhaul purposes for various commercial telecommunication services:

(a) Block-basis in LSA; (b) Point-to-point link-basis; or (c) Any other?

Responses with detailed justifications may kindly be provided for E-band and V-band separately in respect of the relevant commercial telecommunication services.

Tata Communications Response:

- In order to meet the ISPs enterprise customer requirements, there is a need to create a robust network to meet their Enterprise backhaul connectivity requirements. In this regard, the assignment of spectrum in the E-band should be done on an administrative manner as it has the ability to deliver higher bandwidths.

Band	Recommended Assignment Method
E-band	**Point-to-Point link basis** (lightly licensed , administrative)
V-band	**De-licensed indoor & outdoor usage**

- For V-Band Spectrum, it is proposed to de-license the V-band (57-64 GHz) in line with global practice due the limited propagation characteristics of the band. V band is already unlicensed in United States, UK, Japan, China, Korea, Canada, Brazil, Australia, Singapore etc. V band is susceptible to very high propagation loses because of this average link distances are very small (~ 200-300 meters), which makes its use in access applications limited. It should be looked at backhauling purposes mainly. Considering its high bandwidth and propagation characteristics, it would be more suitable to in-campus applications like CNPN backhaul. Over the next few years, we expect about 10000 private networks to be setup in India, based on the allocation of spectrum. In that case, there could be a demand for a similar number of backhaul radios using V band.
- In respect to the E-band, Tata Communications recommends using the lightly licensed administrative methodology for assignment of E-band (71-76/81-86 GHz) as per global practice (Australia, Brazil, Indonesia, S. Korea etc.) to the TSPs with other than access service license/authorization.
- As mentioned above the requirement of spectrum for TSPs other than Access service license is limited to point-to-point link connectivity, leasing out of the spectrum is not recommended for TSPs other than access service license. Additionally, it must be stated that for TSPs with access service license leasing out of E-band spectrum band must not be allowed to avoid any hogging of spectrum by any such players.

Q22. In case it is decided to use different methods (block-based, link based, or any other) for the assignment of the spectrum in E-band and/ or V-band for radio backhaul purposes for different types of commercial telecommunication services, how much spectrum in E-band and V-band should be earmarked for the point-to-point link based assignment for radio backhaul purposes for commercial telecommunication services? Responses with justifications may kindly be provided for E-band and V-band separately.

Tata Communications Response:

- We recommend a minimum Two number of paired 250 MHz FDD carriers in E-Band spectrum to the TSPs other than Access Service License/ Authorization on PAN India basis for enterprise backhaul purpose.

- For V-Band Spectrum, it is proposed to de-license the V-band (57-64 GHz) in line with global practice due the limited propagation characteristics of the band. V band is already unlicensed in United States, UK, Japan, China, Korea, Canada, Brazil, Australia, Singapore etc.
- Additionally, we recommend using the lightly licensed administrative methodology for assignment of E-band (71-76/81-86 GHz) as per global practice (Australia, Brazil, Indonesia, S. Korea etc.) to TSPs with other than access service license/authorization.

Q23. What should be the terms and conditions for the assignment of the spectrum in the E-band for radio backhaul purposes of commercial telecom services such as-

(i) Band plan;

(ii) Carrier size;

(iii) Carrier aggregation;

(iv) Validity period of the assignment;

(v) Renewal mechanism;

(vi) Surrender of the spectrum;

(vii) Ceiling on the number of carriers (spectrum cap);

(viii) Criteria for the assignment of additional spectrum above the ceiling limit; and

(ix) Roll-out obligations etc.?

Kindly provide a detailed response with justifications.

Tata Communications Response:

- We recommend using the lightly licensed administrative methodology for the assignment of E-band (71-76/81-86 GHz) as per global practice.
- The terms and conditions for the assignment of the spectrum in the E-band for radio backhaul purposes of commercial telecom services could be as below:

Sno	Parameter	Recommended Approach
(i)	**Band Plan**	71–76 GHz uplink / 81–86 GHz downlink (FDD)
(ii)	**Carrier Size**	250 MHz FDD carriers
(iii	**Carrier Aggr**	Permitted (where spectrum available)
(iv)	**Validity**	15–20 years with option for annual renewal
(v)	**Renewal**	Light-touch mechanism (self-declaration + usage review)
(vi)	**Surrender**	Permitted post 5 years, without penalty
(vii)	**Spectrum Cap**	No rigid cap; need-based link-wise allocation sufficient
(vii)	**Add. Spectrum**	Based on link congestion, perf. metrics, and deployment density

(ix)	**Roll-out obligation**	None; usage is for enterprise driven deployments

Q24. What frequency range (57-64 GHz, or 57-66 GHz) in the V-band should be adopted for radio backhaul purposes? In case you are of the opinion that the 57-66 GHz range should be adopted for radio backhaul purposes, considering that the 66-71 GHz range is already identified for IMT, whether there is a need for provisioning a guard band between the 57-66 GHz range (for the backhaul purposes) and the 66-71 GHz range (for IMT)? If yes, what should be the guard band? Kindly provide a detailed response with justifications.

Tata Communications Response:

- It is reiterated that the V-Band (57-64 GHz) should be delicensed due to the limited propagation characteristics of the band in line with global practices.
- V band is unlicensed in United States, UK, Japan, China, Korea, Canada, Brazil, Australia, Singapore etc. due to limited propagation characteristics of the band, hence it is proposed to de-license the V-band (57-64 GHz) in India according to global practice.
- V band is susceptible to very high propagation loses because of this average link distances are very small (~ 200-300 meters), which makes its use in access applications limited. It should be looked at backhauling purposes mainly. Considering its high bandwidth and propagation characteristics, it would be more suitable to in-campus applications like CNPN backhaul. Over the next few years, we expect about 10000 private networks to be setup in India, based on the allocation of spectrum. In that case, there could be a demand for a similar number of backhaul radios using V band.

Q25. What should be the terms and conditions for the assignment of the spectrum in the V-band for radio backhaul purposes of commercial telecom services including the following aspects: (i) Band plan; (ii) Carrier size; (iii) Carrier aggregation; (iv) Validity period of the assignment; (v) Renewal mechanism; (vi) Surrender of the spectrum; (vii) Ceiling on the number of carriers (spectrum cap); (viii) Criteria for the assignment of additional spectrum above the ceiling limit; and (ix) Roll-out obligations etc.?

Kindly provide a detailed response with justifications

Tata Communications Response:

- Tata Communications recommends to de-license the V-band (57-64 GHz) in line with global practice due to its limited propagation characteristics of the band. The V band is already unlicensed in in United States, UK, Japan, China, Korea, Canada, Brazil, Australia, Singapore etc.

Sno.	Parameter	Recommended Approach
(i)	**Band Plan**	57–64 GHz (Unlicensed use)
(ii)	**Carrier Size**	50, 100, 125, 250, 500 MHz (flexible)
(iii	**Aggregation**	Permitted across available channels
(iv)	**Validity**	Not applicable

(v)	**Renewal**	Not applicable
(vi)	**Surrender**	Not applicable
(vii)	**Spectrum Cap**	Not applicable for de-licensed use
(viii)	**Extra Spectrum**	Not applicable
(ix)	**Roll-out Obligations**	Not applicable due to local/short-range nature, **de-licensed.**

- The above suggested carrier size for assignment of spectrum in V Bands will provide flexibility for the TSP to choose multiple adjacent/contiguous carriers in the band. With this provision TSP can plan low-capacity, medium capacity, and high-capacity links by choosing an appropriate number of adjacent carriers. This will improve overall efficiency, increase flexibility and will reduce the cost of the network deployment in rural, suburban and urban areas.

Q26. In case it is decided to earmark a few carriers in E-band and/ or V band for services/ usages as "Access" and/ or "Integrated Access & Backhaul (IAB)", -

(a) What quantum of spectrum in E-band and V-band should be earmarked for such services/ usages?

(b) What should be the eligibility conditions to obtain the spectrum in E-band and V-band for such services/ usages?

(c) What should be the terms and conditions for the assignment of spectrum in E-band and V-band through auction such as-

(i) Block size; (ii) Minimum quantity for bidding; (iii) Spectrum cap; (iv) Validity period of the assignment; (v) Roll-out obligations; and (vi) Surrender of spectrum etc.?

(d) Should flexible use [i.e., radio backhaul, and last mile connectivity (fixed wireless access) to the customer equipment] be permitted in frequency ranges earmarked in E-band and/ or V-band for such services/ usages? If yes, should the terms and conditions of the auction of spectrum be the same as those applicable for "access spectrum"?

Responses with detailed justifications and international practices may kindly be provided for E-band and V-band separately.

Tata Communications Response:

- We recommend using the lightly licensed administrative methodology for assignment of E-band (71-76/81-86 GHz) as per global practice (Australia, Brazil, Indonesia, S. Korea etc.) to TSPs with other than access service license/authorization.
- It is proposed to de-license the V-band (57-64 GHz) in line with global practice due the limited propagation characteristics of the band. V band is already unlicensed in United States, UK, Japan, China, Korea, Canada, Brazil, Australia, Singapore etc.

Q27. Whether there is a need for earmarking certain quantum of spectrum in E-band and V-band for point-to-point connectivity requirements of captive (non-commercial/ non-TSP) users? If yes,

(a) What quantum of spectrum in E-band and V-band should be earmarked for such purposes?

(b) What should be the terms and conditions for the assignment of spectrum such as:

(i) Carrier size; (ii) Carrier aggregation; (iii) Ceiling on the number of carriers; (iv) Validity period of the assignment; (v) Renewal mechanism; (vi) Criteria for the assignment of additional spectrum above the ceiling limit; (vii) Roll out obligations; and (viii) Surrender of the spectrum etc.?

Responses with detailed justifications may kindly be provided for E-band and V-band separately.

Tata Communications Response:

- Tata Communications recommend use of lightly licensed, administrative methodology for assignment on a Point-to-Point (P2P) link basis, as per global practice (Australia, Brazil, Indonesia, S. Korea etc).
- The E &V Band spectrum has the ability to deliver higher bandwidths and can be deployed for last mile connectivity and backhaul applications, high-capacity P2P links and Private Networks. Therefore, it is recommended that the E-band be lightly licensed and made available to all licensed service providers.
- The ecosystem is mature with standardized 3GPP specs, available radio equipment, and growing deployments globally (e.g., USA, Brazil, Korea). Prominently, existing enterprise offerings will directly benefit from E-band P2P deployments.

Q28. In case your response to Q27 is 'no', in what manner should the point-to-point connectivity requirements of captive (non-commercial/ non-TSP) users be fulfilled? Kindly provide a detailed response with justifications.

Tata Communications Response:

No comments in view of Tata Communications response to Q27.

Q29. Whether it is feasible to allow low power indoor consumer device to-consumer device usages on a license-exempt basis in the V-band in parallel to the use of the spectrum by telecom service providers for the establishment of terrestrial networks in a part or full V-band? Kindly provide a detailed response with justification and international scenario.

and

Q30. In case it is decided to allow low power indoor consumer device-to-device usages on a license-exempt basis in the V-band (57-64/66 GHz), -

(a) Should it be permitted in the entire V-band or only in a portion of the V-band? If it should be permitted only in a portion of the V-band, please specify the frequency range.

(b) In case it is decided to permit low power indoor consumer device-to-device usages on a license-exempt basis in the entire V-band, whether the 57-64 GHz range, or the 57-66 GHz range should be considered for such usages?

(c) What should be the carrier size/ channel bandwidth?

(d) What should be the definition of indoor usages?

(e) What technical parameters should be prescribed, including EIRP limits for low power indoor consumer device-to-device usages?

Kindly provide a detailed response with justifications and international scenario.

Tata Communications Response Q29 and Q30

- The V-band (57-64 GHz) should be delicensed in line with global practice due the limited propagation characteristics of the band. V band is already unlicensed in United States, UK, Japan, China, Korea, Canada, Brazil, Australia, Singapore etc.
- The low power indoor purpose should be permitted along with unlicensed use of outdoor applications.

Q31. Whether there is a need for permitting "outdoor" usages of V-band on a license-exempt basis? Kindly provide a detailed response with justification and international scenario.

Tata Communications Response:

In our view, yes permitting the outdoor usage of V-band on a license-exempt basis is feasible and beneficial, as proven by global precedents[8].

- The **oxygen absorption characteristics** of V-band naturally limit range and interference.
- Outdoor links support **enterprise-grade FWA** and **building-to-building** broadband.
- Countries like the USA, UK, and Japan permit outdoor unlicensed or lightly licensed V-band use under technical limits.

Country/Region	Regulatory Status
United States (FCC)	License-exempt use of 57–71 GHz for both indoor and outdoor use. with EIRP limits (max 40 dBm for outdoor). Widely used for FWA and short-range backhaul.
United Kingdom (Ofcom)	License-exempt use of 57–71 GHz. Outdoor use permitted with EIRP limits (55 dBm for fixed outdoor P2P links).
European Union (CEPT/ECC)	License-exempt under **ECC Recommendation** revised for 57–71 GHz. Outdoor use permitted with specific technical requirements.
Canada (ISED)	Outdoor license-exempt use allowed in 57–64 GHz band. Similar limits to the US.
Australia (ACMA)	License-exempt use permitted in 57–64 GHz for both indoor and outdoor with power and antenna limits.

Globally most **regulatory regimes permit outdoor, license-exempt V-band usage**, with technical limits like power, antenna gain etc to control interference.

[8] https://www.ecfr.gov/current/title-47/chapter-I/subchapter-A/part-15/subpart-C/subject-group-ECFR2f2e5828339709e/section-15.255 and https://www.law.cornell.edu/cfr/text/47/15.255 and https://dev.ti.com/tirex/explore/content/radar_academy_2_10_00_2/_build_radar_academy_2_10_00_2/source/device_selection/regulations.html

Q32. If the response to the Q31 is in the affirmative, whether it is feasible to allow outdoor usages on a license-exempt basis in the V-band in parallel to the use of the spectrum by telecom service providers for the establishment of terrestrial networks in a part or full V-band? Kindly provide a detailed response with justification and international scenario.

Tata Communications Response:

In our view and as per response given above for Q31, outdoor use of the V-band on a license-exempt basis is feasible and highly beneficial when governed by clear technical rules.

- Delicensed usage of the spectrum in point-to-point fixed links: USA, UK, New Zealand, Australia and Singapore have permitted point-to-point fixed links (with specified power limits) in the V-band.
- For V-Band Spectrum, it is proposed to de-license the V-band (57-64 GHz) in line with global practice due the limited propagation characteristics of the band. V band is already unlicensed in Europe, Australia, Canada, Japan, Republic of Korea and the United States.

Q33. In case it is decided to allow outdoor usages on a license-exempt basis in the V-band (57-64/ 66 GHz), -

(a) Should it be permitted in the entire V-band or only in a portion of the V-band? If it should be permitted only in a portion of the V-band, please specify the frequency range.

(b) In case it is decided to permit outdoor usages on a license exempt basis in the entire V-band, whether the 57-64 GHz range, or the 57-66 GHz range should be considered for such usages?

(c) What should be the carrier size/ channel bandwidth?

(d) What technical parameters should be prescribed, including EIRP limits for low power indoor consumer device-to-device usages? Kindly provide a detailed response with justifications and international scenario.

Tata Communications Response:

It is recommended to permit license-exempt outdoor usage of V-Band[9] ranging 57-64 GHz.

Sno	Parameter	Recommendation
(a)	**Frequency Range**	Permit outdoor license-exempt use in **57–64 GHz**
(b)	**Full Band**	Yes, entire 57–64 GHz range for both indoor and outdoor use
(c)	**Carrier Size**	Flexible: 100–500 MHz channels
(d)	**Technical Parameters**	EIRP ≤ 55 dBm, Directional antenna

[9] https://docdb.cept.org/download/1826

Q34. Any other suggestions relevant to the assignment of the spectrum in E-band (71-76/ 81-86 GHz) and V-band (57-64/ 66 GHz) may kindly be made with detailed justifications.

Tata Communications Response:

It is suggested to assign carrier of 250 MHz (paired) spectrum in E- Band administratively to Enterprises / Entities who would like to deploy Captive Non-public network (CNPN) in their premises provided these Enterprises / Entities are required to obtain CNPN license from DoT.

Some suggested terms and conditions that could be considered for the assignment of spectrum to the Users - Other entities (non- TSP, for non- commercial/ captive/ isolated use):

- **Eligibility conditions:** Spectrum assignees may need to meet certain eligibility criteria, such as technical competence, financial capability, and compliance with relevant regulatory requirements.
- **Technical specifications:** Spectrum assignees may need to comply with certain technical specifications, such as power limits, frequency bands, and distance to ensure efficient use of the spectrum and minimize the risk of harmful interference.
- **Spectrum sharing arrangements:** Spectrum assignees may need to develop spectrum sharing arrangements to ensure that CNPN services can co-exist without causing harmful interference with other Users of these spectrum bands.
- **Interference management:** Spectrum assignees may need to develop interference management plans to address any interference issues that may arise between CNPN licensees and other users. This may involve developing advanced interference mitigation techniques, conducting regular interference monitoring, reporting, and coordinating with other spectrum users to manage interference issues.

In addition to above, it is also submitted that the new frequency bands considered for IMT services - 37 - 37.5 GHz and 37.5 - 40 GHz and 42.5 - 43.5 GHz for IMT services, should be made available to all licensed service providers and it is recommended that at least a paired 250 MHz spectrum in the 37.5-40 GHz and 42.5-43.5 GHz bands should be kept reserved specifically for Microwave Point-to-Point (PTP) applications as a backhaul spectrum as it has the ability to deliver higher bandwidths to all the Licensed Operators.

Q35. In case the 6 (lower)/7/13/15/18/21 GHz bands for radio backhaul of various commercial telecom services are assigned on a Point-to-Point (P2P) Link basis, should the spectrum charges be levied:

i. As a percentage of Adjusted Gross Revenue (AGR), or

ii. On a per carrier/link basis, or

iii. Through any alternative mechanism (please specify)?

Kindly provide a detailed justification for the approach considered most suitable, along with the suggested percentage of AGR or the applicable per link/per carrier charge.

Tata Communications Response:

- As suggested earlier in our response, Microwave spectrum (7/13/15/18/21 GHz) should be assigned for Point-to-Point (P2P) links on administrative allocation on pan India basis with minimum Two numbers of 28MHz FDD paired channels to TSPs other than access service license to meet their Enterprise Customers requirements.
- Annual spectrum charges for Microwave spectrum should be levied on a Point-to-Point (P2P) Link basis.

Q36. In case the 6 (lower)/7/13/15/18/21 GHz bands for radio backhaul of various commercial telecom services are assigned on a block basis for the entire Licensed Service Area (LSA), should the spectrum charges be levied:

i. As a percentage of Adjusted Gross Revenue (AGR), or

ii. On a per MHz or per carrier basis, or

iii. Through any alternative mechanism (please specify)?

Kindly provide a detailed justification for the approach considered most suitable, along with the suggested percentage of AGR or the applicable per carrier/ MHz charge.

Tata Communications Response:

Annual spectrum charges for Microwave spectrum should be levied on a Point-to-Point (P2P) Link basis for Enterprise usage.

Q37. In case it is decided to assign some frequency spectrum in 6 (lower)/7/13/15/18/21 GHz spectrum bands for last mile connectivity (Fixed Wireless Access) of commercial telecom services through auction, then:

(i). Should the auction determined price of other bands by using spectral efficiency factor serve as a basis of valuation for the above bands? If yes, which spectrum bands be related, what efficiency factor or formula should be used and what is the basis for the same? Please justify your suggestions.

(ii). If response to question (i) above is no, what other methodology may be used.

Please justify your suggestions.

Tata Communications Response:

Tata Communications do not support auction of the spectrum in 6 (lower)/7/13/15/18/21 GHz spectrum bands.

Q38. In case it is decided to assign some frequency spectrum in 6 (lower)/7/13/15/18/21 GHz spectrum bands for last mile connectivity (Fixed Wireless Access) of commercial telecom services through auction, then:

(i). Should the auction determined price of other countries in 6/7/13/15/18/21 GHz spectrum bands for last mile connectivity and/or IMT services serve as a basis of valuation of microwave bands for last mile connectivity? What methodology should be followed for using this auction determined price as a basis for valuation? Support your suggestions with justifications and country-wise auction data.

(ii). If the above approach is considered appropriate, should the international auction-determined prices be normalized to account for cross-country differences such as population, GDP, purchasing power parity (PPP), subscriber base, and other relevant factors? If so, should normalization be carried out by using the ratio of auction prices of spectrum bands within the same country to neutralize the impact of cross-country differences? Alternatively, please suggest any other suitable normalization methodology that may be adopted in this context.

(iii). Apart from the approaches highlighted above which other valuation approaches may be adopted for the valuation of 6(lower)/7//13/15/18/21 GHz spectrum bands?

Please provide detailed information.

Tata Communications Response:

No comments in view of response provided in Q37.

Q39. What valuation methodology should be followed if it is decided to assign frequency spectrum in traditional microwave backhaul bands for flexible use (i.e. both backhaul connectivity and last mile connectivity) of commercial telecom services through auction? Please provide detailed justification.

Tata Communications Response:

No comments in view of response provided in Q37.

Q40. Should the spectrum charges for 6 (lower)/ 7/ 13/ 15/ 18/ 21 GHz bands for non-commercial/ captive backhaul use continue to be levied as per the M x C x W formula specified in the DoT's order No. P-11014/34/2009-PP dated 11.12.2023? Is there a need to revise this formula by inclusion of additional factors, modifying slab/factor values etc.? If yes, please specify which additional factors should be included and what should be the revised slab/factor values? Please provide detail of the same alongwith justification.

Tata Communications Response:

- Annual spectrum charges for Microwave spectrum should continue to be levied on "link-by-link" basis.

Q41. If the answer to above question is no, whether an alternative charging mechanism should be adopted for levying spectrum charges for 6 (lower)/ 7/ 13/ 15/ 18/ 21 GHz bands for non-commercial/ captive backhaul use? Please provide detailed justification.

Tata Communications Response:

No comments.

Q42. In case the E-band (71-76/ 81-86 GHz) is assigned for Radio backhaul purpose for various commercial telecommunication services and on a Point-to-Point (P2P) link basis, should the spectrum charges be levied:

(i). As a percentage of Adjusted Gross Revenue (AGR), or

(ii). On a per carrier/link basis, or

(iii). Through any alternative mechanism (please specify)?

Kindly provide a detailed justification for the approach considered most suitable, along with the suggested percentage of AGR or the applicable per carrier/link charge.

Tata Communications Response:

Annual spectrum charges for Microwave spectrum should be levied on a Point-to-Point (P2P) Link basis.

Q43. In case the E-band (71-76/ 81-86 GHz) is assigned for Radio backhaul purpose for various commercial telecommunication 171 services and on a block basis for the entire Licensed Service Area (LSA), should the spectrum charges be levied:

(i). As a percentage of Adjusted Gross Revenue (AGR), or

(ii). On a per MHz or per carrier basis, or

(iii). Through any alternative mechanism (please specify)?

Kindly provide a detailed justification for the approach considered most suitable, along with the suggested percentage of AGR or the applicable per MHz/per carrier charge.

Q44. In case the V-band (57-64/66 GHz) is assigned for Radio backhaul purpose for various commercial telecommunication services and on a Point-to-Point (P2P) link basis, should the spectrum charges be levied:

(i). As a percentage of Adjusted Gross Revenue (AGR), or

(ii). On a per carrier/link basis, or

(iii). Through any alternative mechanism (please specify)?

Kindly provide a detailed justification for the approach considered most suitable, along with the suggested percentage of AGR or the applicable per carrier/ link charge.

Q45. In case the V-band (57-64/66 GHz) is assigned for Radio backhaul purpose for various commercial telecommunication services and on a block basis for the entire Licensed Service Area (LSA), should the spectrum charges be levied:

(i). As a percentage of Adjusted Gross Revenue (AGR), or

(ii). On a per MHz or per carrier basis, or

(iii). Through any alternative mechanism (please specify)?

Kindly provide a detailed justification for the approach considered most suitable, along with the suggested percentage of AGR or the applicable per MHz/per carrier charge.

Q46. In case it is decided to assign some frequency spectrum in E-band (71-76/ 81-86 GHz) and/or V-band (57-64/66 GHz) for Access (last mile connectivity)/ Integrated Access Backhaul (IAB) through auction, then:

(i) Should the auction determined price of other bands serve as a basis of valuation for the above bands using spectral efficiency factor? If yes, which spectrum bands be related, what efficiency factor or formula should be used and what should be the basis for the same? Please justify your suggestions

(ii) If response to question (i) above is no, what other methodology may be used? Please justify your suggestions.

Q47. In case it is decided to assign some frequency spectrum in E-band (71-76/ 81-86 GHz) and/or V-band (57-64/66 GHz) for Access (last mile connectivity)/ Integrated Access Backhaul (IAB) through auction, then:

(i). Should the auction determined price of other countries in Eband (71-76/ 81-86 GHz) and/or V-band (57-64/66 GHz) serve as a basis of valuation of these bands? If yes, what methodology should be followed for using this auction determined price as a basis for valuation? Support your suggestions with justifications and country-wise auction data.

(ii). If the above approach is considered appropriate, should the international auction-determined prices be normalized to account for cross-country differences such as population, GDP, purchasing power parity (PPP), subscriber base, and other relevant factors? If so, should normalization be carried out by using the ratio of auction prices of spectrum bands within the same country to neutralize the impact of cross-country

differences? Alternatively, please suggest any other suitable normalization methodology that may be adopted in this context.

(iii). Apart from the approaches highlighted above which other valuation approaches should be adopted for the valuation of E-band (71-76/ 81-86 GHz) and/or V-band (57-64/66 GHz)? Please provide detailed information.

Q48. In case it is decided to assign some frequency spectrum in E-band (71-76/ 81-86 GHz) and/or V-band (57-64/66 GHz) for point-to-point connectivity requirements of captive (non-commercial/ non - TSP) users, then:

(i) Should the spectrum charges for E-band (71-76/ 81-86 GHz) and/or V-band (57-64/66 GHz) for point-to-point connectivity requirements of captive (non-commercial/ non-TSP) users may be levied as per the M x C x W formula as specified in the DoT's order No. P-11014/34/2009-PP dated 11.12.2023? Is there a need to revise this formula by inclusion of additional factors, modifying slab/factor values etc.? If yes, please specify which additional factors should be included and what should be the revised slab/factor values. Please provide detail of the same along with justification.

(ii) If the answer to above question is no, whether an alternative charging mechanism such as link-to-link charges as recommended in 2014 for levying spectrum charges for E and V bands for non - commercial/ captive backhaul use, should be adopted? Please provide detailed justification.

Tata Communications Response to Q43, Q44, Q45, Q46, Q47 and Q48:

- Tata Communications recommends the E-band to be lightly licensed, and V-Band should be delicensed due the limited propagation characteristics of the band in line with global practices.
- For V-Band Spectrum, it is proposed to de-license the V-band (57-64 GHz) in line with global practice due the limited propagation characteristics of the band. V band is already unlicensed in Europe, Australia, Canada, Japan, Republic of Korea and the United States.
- In respect to the E-band, Tata Communications recommends using the lightly licensed administrative methodology for assignment of E-band (71-76/81-86 GHz) spectrum in line with the global practices (Australia, Brazil, Indonesia, S. Korea etc.) to the TSPs with other than access service license/authorization with minimum Two number of paired 250 MHz FDD carriers in E-Band spectrum to the TSPs other than Access Service License/ Authorization on PAN India basis. We are of the view that the suggested carrier size for assignment of spectrum in E&V Bands will provide flexibility for the TSP to choose multiple adjacent/contiguous carriers in the band. With this provision TSP can plan low-capacity, medium capacity, and high-capacity links by choosing an appropriate number of adjacent carriers. This will improve overall efficiency, increase flexibility and will reduce the cost of the network deployment in rural, suburban and urban areas. Hence, Tata Communications do not recommend auction of the E & V Band spectrum.
- The license cost is estimated for 250 MHz/year (Euro) under lightly license regime across various countries. Same reference can be used for estimation of E-band spectrum fee in India.

Q49. In case it is decided to assign some frequency spectrum in 6 (lower)/ 7/13/15/18/21 GHz spectrum bands for last mile connectivity (Fixed Wireless Access) of commercial telecom services and in Eband (71-76/ 81-86 GHz) and/or V-band (57-64/66 GHz) for Access (last mile connectivity)/ Integrated Access Backhaul(IAB) through auction, then: Should the value of: 174 (a) 6 (lower)/7/13/15/18/21 GHz bands (for last mile

connectivity) (b) E-band (71–76/81–86 GHz) and V-band (57–64/66 GHz) (for Access (last mile connectivity)/IAB) be determined using a single valuation approach? If yes, please indicate which single valuation approach or method should be adopted in each case and provide detailed justification

Q50. In case your response to the above question is negative, will it be appropriate to take the average valuation (simple mean) of the valuations obtained through the different approaches attempted for valuation of the above spectrum bands, or some other approach like taking weighted mean etc. should be followed? Please support your answer with detailed justification.

Q51. In case it is decided to assign some frequency spectrum in 6 (lower)/ 7/13/15/18/21 GHz spectrum bands for last mile connectivity (Fixed Wireless Access) of commercial telecom services and in Eband (71-76/ 81-86 GHz) and/or V-band (57-64/66 GHz) for Access(last mile connectivity)/ Integrated Access Backhaul (IAB) through auction, then: What ratio should be adopted between the reserve price for the auction and the valuation of the spectrum in:

(a) 6 (lower)/7/13/15/18/21 GHz bands (for last mile connectivity)

(b) E-band (71–76/81–86 GHz) and V-band (57–64/66 GHz) (for Access (last mile connectivity)/IAB) and why?

Please support your answer with detailed justification.

Q52. In case it is decided to assign some frequency spectrum in 6 (lower)/ 7/13/15/18/21 GHz spectrum bands for last mile connectivity (Fixed Wireless Access) of commercial telecom services and in E- band (71-76/ 81-86 GHz) and/or V-band (57-64/66 GHz) for Access(last mile connectivity)/ Integrated Access Backhaul (IAB) through auction, then: What should the payment terms and associated conditions for the assignment of

(a) 6 (lower)/7/13/15/18/21 GHz bands (for last mile connectivity)

(b) E-band (71–76/81–86 GHz) and V-band (57–64/66 GHz) (for Access (last mile connectivity)/IAB) relating to:

(i). Upfront payment

(ii). Moratorium period

(iii). Total number of instalments to recover deferred payment

(iv). Applicable interest rate for protecting the NPV of bid amount Please support your answer with detailed justification.

Tata Communications Response to Q49, Q50, Q51 and Q52:

- We do not support assignment of E&V Band spectrum through auction.
- Backhaul spectrum are natural resources and do not need any upfront investment to make them available for use. Therefore, apart from administrative charges, no upfront charges should be levied on their administrative assignment to TSPs / Other entities.
- Tata Communications recommends the E-band to be lightly licensed, and V-Band should be delicensed due the limited propagation characteristics of the band in line with global practices.

Q53. Any other suggestions relevant to the subject may be submitted with detailed justification.

Tata Communications Response:

We would like to submit the below proposal for establishing a structured framework for Spectrum (other than access spectrum)

- Presently, there is a no formalized / standardized process in place for surrendering spectrum other than access spectrum-particularly the spectrum earmarked for backhaul, enterprise, or other non-access services in India. Whereas the surrender of spectrum (other than access spectrum) globally follows a structured, transparent process focused on regulatory approval, dues clearance, and efficient reallocation. India's guidelines do not reflect these best practices which emphasizes simplicity, defined timelines, and market efficiency.
- This gap affects a wide range of service categories including Internet Service Providers (ISPs), National and International Long Distance (NLD/ILD) operators, Captive VSAT licensees, and Unified License holders not offering access services. In light of evolving technologies and shifting business models, these entities may find continued holding of certain spectrum bands—such as microwave backhaul or satellite spectrum—commercially unviable or operationally redundant. The absence of a defined surrender mechanism results in regulatory uncertainty, potential legal and financial disputes, inefficient spectrum utilization, and unclear compliance obligations.
- Due to non-existence of such process, non-access service providers have been facing several challenges in completion of the surrender and reconciliation process with WPC of earlier allocated spectrum from several years despite of rigorous and consistent follow-ups at various levels. Moreover, such delays also led to the imposition of late fee and interest thereof making the huge outstanding amount liable to pay for the reasons which are beyond the control of the licensee.
- To address these challenges, it is essential to consider this issue for inclusion in the forthcoming consultation paper with aim to develop and implement a comprehensive, transparent, and time-bound framework specifically designed for spectrum surrender by non-Access licensees. This framework should clearly define eligibility criteria, permit partial or complete surrender (including state-wise, circle-wise, or specific band-wise surrender), and prescribe detailed documentation requirements—such as a formal notice outlining the spectrum band, bandwidth, affected service areas, and the intended date of surrender. Importantly, the framework should ensure that no further Spectrum Usage Charges (SUC), penalties, or interest accrue from the date the surrender notice is received by the licensor. The calculation of dues should cease on the date of submission, and the license should not be held accountable for any processing delays on the part of the licensor. Furthermore, a defined timeline should be followed for closure of the surrender process, including timely intimation of any additional documentation or compliance requirements. Applicable policies, circulars, and guidelines governing surrender should be clearly communicated either at the time of license issuance or during the surrender process to ensure full regulatory clarity and compliance.

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