



DG/COAI/TECH/2025/3051

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Subject: COAI Response on 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 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 released on May 28, 2025.

In this regard, please find enclosed COAI Response to the Consultation Paper.

We hope that our submission will merit your kind consideration and support.

With Regards,

Signed on: 03-07-2025 13:26:12
Digitally Signed by:
Lt Gen Dr SP Kochhar
DG
COAI
Signature Valid From: 2025-02-22 10:45:32
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COAI Response on 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

At the outset, we would like to thank the Authority for providing us with the opportunity to submit our comments to the Consultation paper on Assignment of the Microwave Spectrum in 6GHz (lower), 7GHz, 13 GHz, 15 GHz, 18 GHz, 21 GHz Bands, E-Band, and V-Band.

Modern high-capacity networks require equally efficient backhaul and access networks to enable the customers to have an always connected experience. The availability of backhaul carriers is crucial for the deployment of newer technologies and should therefore be regarded as an essential resource. It serves as a complementary infrastructure that enables the swift and efficient rollout of networks utilizing RF access spectrum.

Since these spectrum bands are essential for increasing the capacity and network expansion, we submit that the Authority may adopt a legally tenable, predictable, transparent and investor friendly mode of spectrum assignment for these bands.

With regard to the spectrum pricing, we submit that making spectrum available at affordable rate would enhance and help in achieving the goal of maximization of spectrum utilization as well as the national objectives which includes proliferation goals, goals of Digital India on all spheres of life in the country.

Our Issue -Wise response is as below:

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.

COAI Response:

1. While India is advancing in fiberization, around 154% of base stations are still connected via wireless backhaul. The traditional microwave bands thus remain indispensable, especially in geographies where optical fiber rollout is impractical due to cost, terrain, or administrative constraints.
2. We are of the view that **there is no need to study the demand for the traditional microwave backhaul bands, i.e., 6 GHz (lower), 7 GHz, 13 GHz, 15 GHz, 18 GHz, and 21 GHz bands for radio backhaul purposes at this stage.**

¹ https://www.trai.gov.in/sites/default/files/2025-05/CP_28052025.pdf (pg 12)



3. What is required now is regulatory certainty and continuity in the availability of these bands to TSPs, not a reassessment of demand. Any ambiguity in their continued assignment may adversely affect network planning and investment decisions.

Notwithstanding above, we are of the view that the demand for these traditional microwave bands will persist due to:

- a. Rapid urbanization and densification requirements.
 - b. Increased cellular traffic from 5G and future network technologies.
 - c. Necessity for resilient and cost-effective backhaul solutions, especially in geographies challenging for fiber deployment.
4. Therefore, **the existing spectrum in traditional microwave backhaul bands should be made fully available to TSPs having an Access License.**

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.

COAI Response:

As highlighted in our response to Q1., the traditional microwave backhaul spectrum bands (6 GHz [lower], 7 GHz, 13 GHz, 15 GHz, 18 GHz, and 21 GHz) **should be assigned exclusively to the TSPs having an Access License.**

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.

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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.



COAI Response to Q3 & Q4:

MWA:

1. Any attempt to assign MWA on a link-by-link assignment basis will be both cumbersome and impractical due to the requirement of effective co-ordination for huge numbers of MWA links that are deployed by the TSPs.
2. Considering the prevailing arrangement and large-scale deployments required in case of microwave access carriers, Link by Link assignment is not a feasible or practical option today for already allocated bands (13GHz/15GHz/18GHz/21GHz).
3. Thus, we are of the view that the assignment of MWA should continue to be on block basis i.e. on an exclusive basis for the entire LSA.
4. **MWB:** Similarly, the assignment of the MWB spectrum should also be on an exclusive basis for the entire LSA.

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.

COAI Response:

1. **Carrier Size:** We are of the view **that the carrier size of 28 MHz is sufficient and should continue.** In case any TSPs need more bandwidth, to meet the need of growing Traffic then, they may buy multiple carriers of 28 MHz.
2. **Carrier aggregation:** Carrier aggregation in the traditional microwave backhaul bands should be fully permitted without any regulatory restrictions or preconditions or requirement to notify. **The TSPs should have the freedom to aggregate carriers based on their technical requirements and spectrum availability,** without the need for approvals or coordination beyond the initial assignment.
3. **Validity period of the assignment: The Validity period** of the assignment of the 6 GHz (lower),



7 GHz, 13 GHz, 15 GHz, 18 GHz, 21 GHz Bands, bands **should be 20 years or till the TSP is providing the access service, whichever is later.**

4. Roll-out obligations; No roll-out obligations should be associated with the assignment of spectrum in 6 GHz (lower), 7 GHz, 13 GHz, 15 GHz, 18 GHz, 21 GHz Bands, E-Band, and V-Band on the TSPs.

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.

COAI Response:

Yes, TSPs holding carriers in traditional microwave backhaul bands should be granted the **option to retain their existing assignments**. This is critical to ensure network integrity, avoid disruption in services to consumers for a prolonged period and to protect existing investments.

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.

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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.

COAI Response to Q9 & Q10:

1. We would like to submit that the entire 15 GHz (14.8–15.35 GHz) band should be allocated exclusively for microwave backhaul use, and there is no need to review its usage at WRC-27.
2. The 15 GHz band has established itself as the backbone of microwave backhaul operations in the telecom sector. Its favorable propagation features, ample bandwidth, and mature ecosystem of equipment have made it critical, especially for connectivity in semi-urban and rural regions. A large proportion of India's microwave links currently rely on this spectrum.
3. Any proposal to reassign the 15 GHz band for IMT purposes would severely disrupt existing backhaul infrastructure and undermine the quality and reliability of mobile networks. Given that fiber penetration remains limited to roughly 46%, microwave continues to be the primary scalable

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connectivity solution across many regions. It is therefore imperative that the 15 GHz band remain reserved solely for licensed microwave backhaul use well beyond WRC-27, thereby safeguarding past infrastructure investments and ensuring uninterrupted service delivery.

4. The 7 GHz frequency range (7.125–8.4 GHz) has been internationally recognized as a leading candidate band for IMT (International Mobile Telecommunications). It is actively under review within WRC-27 discussions (Agenda Item 1.7). The band is highly attractive owing to its mid-band propagation qualities, its ability to accommodate large contiguous channels, and the significant potential for achieving global harmonization of spectrum allocations.
5. Setting aside this band exclusively for future IMT applications will help ensure that domestic networks can capitalize on economies of scale, achieve seamless cross-border interoperability, and maximize spectral efficiency.

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.

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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 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.



COAI Response to Q11 & Q12:

We are of the view that there is no need to earmark any specific quantum of spectrum in the traditional microwave backhaul bands exclusively for FWA or other last-mile commercial use.

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.

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

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.

COAI Response (Q13-Q15):

1. We are of the view that **no portion of the traditional microwave backhaul spectrum bands should be earmarked or assigned directly to non-TSP (captive or non-commercial) users.**
2. Instead, we submit that such connectivity **needs to be addressed through a well-regulated spectrum leasing framework**, wherein licensed TSPs are allowed to lease their spectrum to such entities.



3. Allowing the leasing of spectrum will open up **new monetization opportunities for TSPs**, and help serve these captive requirements without requiring direct spectrum allocation to the end-users. This aligns with global best practices and fosters a healthy commercial ecosystem.
4. We are of the firm opinion that with advancement of technologies, there is no justification whatsoever for continuation of **captive (non-commercial/ non-TSP) users**.
5. The licensed Access Service Providers are fully capable of providing all customised solutions including M2M / Industrial 4.0 services in the most competitive and economic manner and in fact providing such network configuration to private and public sector entity.
6. Hence, there is no need to alienate spectrum directly to companies for private captive network.
7. When a captive non-commercial/non-TSP network is part of a commercial network it addresses the following issues for orderly growth of the sector.
8. This also adheres to the principle of “Same Service Same Rule”. Any move such as setting aside/ allocation of microwave/E & V (via delicensing or through separate charging mechanism) for catering to the connectivity needs of Industry 4.0 / M2M communication services by way of Private **(non-commercial/ non-TSP users) Captive Networks**, not only truncate the revenues of the licensed service providers but also affect the revenue of the Government. This also creates a non-level playing field pointing to arbitrariness in basic policies scaring away the investors leading to disorderly growth of the sector by back door entry with undue advantage to private commercial entities at the cost government exchequer.
9. Captive Network within the commercial network fulfil the requirement of “Law Enforcement Agencies” as necessary lawful interception and monitoring is provided by the service provider while no such facility is available to LEAs in private captive networks. The anti-social elements may exploit this facility to bypass interception and monitoring of message in the interest of security. Thus, Private Captive Networks are detrimental to national security and should not be permitted.
10. It is pertinent to note that spectrum is a key finite resource with high economic value. The spectrum allocation in any spectrum band that can be used to deploy support and provide communication services, irrespective of the entity desiring to use the spectrum or the technology deployed, or type of services offered, should be allocated only to licensed access service providers. **Therefore, we do not support delicensing/ reserving any Spectrum bands for Private (non-commercial/ non-TSP users) Captive Networks.**
11. We urge the Authority not to recommend to reserve or de-license any spectrum which has been identified or likely to be identified for use of Backhaul/IMT/ commercial services, for Private Captive Networks

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12. Any de-licensing/reservation of spectrum for Industrial use/establishment of private networks, as demanded by few companies, would not only cause huge loss to the exchequer but will also lead to sub-optimal utilization of this scarce resource. Hence, such a move is technically also uncalled for. Sufficient unlicensed spectrum bands are available to cater these private network requirements.
13. We would also like to give details of the assessment of economic impact done by **Compass Lexicon on the specific example of Germany keeping aside commercial spectrum for local private networks**. The assessment mentions that the costs of set-aside to German society are significant, while any benefits are likely to be marginal. Specifically, it finds that:
 - a. No evidence that spectrum set-aside justifiable from spectrum policy perspective.
 - b. Insufficient evidence of market failures to justify departure from market based awards.
 - c. There are less costly policy alternatives that would deliver most if not all of any identified benefits;
 - d. Set-aside of 100 MHz in Germany could cause consumers welfare loss around €6.2 - €15.6 billion also consumers may suffer from a significant degradation in QOS;
 - e. Public network operators paid €2.2 billion extra in the German auction - Money that could have been used for faster and more extensive deployment of 5G; and
 - f. f. Decrease in capability of public mobile networks will have ripple effect on wider economy.
14. Keeping in view the above, we **submit that**:
 - a. In today's scenario, there is no need for separate private captive networks and same should be dispensed with the availability of state-of art telecommunication network.
 - b. Private Captive Networks are detrimental to national security.
 - c. The licensed Access Service Providers are fully capable of providing these services in most competitive and economic manner compared to private companies looking for such solutions.
 - d. Request the Authority not to recommend to reserve or de-license any spectrum which has been identified or likely to be identified for use of Backhaul/IMT. It amounts to undue advantage to private commercial entities at the cost of government exchequer.
 - e. Any de-licensing/reservation of spectrum for Industrial use/establishment of private Captive networks, as demanded by few companies, would not only cause huge loss to the exchequer but will also lead to sub-optimal utilization of this scarce resource. Hence, such move is not only technically uncalled for but also legally untenable.

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.

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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 ecosystem.

COAI Response (Q18 & 19):

1. We are of the view that **there is no need to study the demand for the E & V bands for each of the service/ usage viz. “Backhaul”, “Access” and “Integrated Access & Backhaul (IAB).**
2. Existing spectrum in E&V bands should be made fully available to TSPs having an Access License

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.

COAI Response:

We would like to submit here that the **spectrum in E and V band should be assigned exclusively to the TSPs having an Access License**

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 Eband and V-band separately in respect of the relevant commercial telecommunication services.

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Q22. In case it is decided to use different methods (block-based, linkbased, 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 Eband and V-band should be earmarked for the point-to-point linkbased assignment for radio backhaul purposes for commercial telecommunication services? Responses with justifications may kindly be provided for E-band and V-band separately.



COAI Response to Q21 & Q22:

1. Requirement to assign E & V band on a link-by-link assignment basis will be both cumbersome and impractical due to the requirement of effective coordination for huge numbers of links that are deployed by the TSPs.
2. Thus, we are of the view that the assignment of these bands **should be on an exclusive block basis for the entire LSA.**

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.

COAI Response:

1. **Band plan;** E Band (71 to 76 GHz & 81 to 86 GHz)

2. **Carrier size;**

E band:

We suggest for the carrier **size of 250 MHz each** with duplex separation of 10 GHz has been adopted.

3. **Carrier aggregation:** Carrier aggregation in E and V-Band should be fully permitted without any regulatory restrictions or preconditions. **The TSPs should have the freedom to aggregate carriers based on their technical requirements and spectrum availability**, without the need for approvals or coordination beyond the initial assignment.
4. **Validity period of the assignment:** The Validity period, E & V bands **should be assigned for 20 years or till the TSP is providing the access service, whichever is later.**
5. **Roll-out obligations; No roll-out obligations** should be associated with the assignment of spectrum in, E and V-Band, on the TSPs.

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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

COAI Response:

1. Carrier size;

For V -band we suggest that the channel size can be defined in **multiples of 50 MHz**.

2. Carrier aggregation: Carrier aggregation should be fully permitted without any regulatory restrictions or preconditions. **The TSPs should have the freedom to aggregate carriers based on their technical requirements and spectrum availability**, without the need for approvals or coordination beyond the initial assignment.

3. Validity period of the assignment:

The Validity period of V bands should be 20 years or till the TSP is providing the access service, whichever is later.

4. Roll-out obligations: No roll-out obligations should be associated with the assignment of spectrum in V-Band on the TSPs.

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 Eband and V-band separately.

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

COAI Response to Q27 & Q28:

1. The E-Band (71-76 GHz/ 81-86 GHz) has already been assigned LSA wise for Backhaul purpose to TSPs on a provisional basis, during 2022. Given the technical characteristics of the E-Band — such as its high bandwidth and line-of-sight propagation — it is ideally suited for dense urban deployments and small cell backhaul. However, a critical limitation of the E-Band is the relatively low number of carriers available, making the spectrum inherently constrained in terms of simultaneous usage by multiple stakeholders.
2. Opening up this band to non-TSP or non-commercial users (such as private networks, enterprises, or governmental applications) could lead to inefficient spectrum utilization, coordination complexities, and potential interference risks. This would adversely impact the network performance and quality of service for TSPs, ultimately affecting end users.
3. We are of the view that **no portion of the spectrum in E-band and V-band spectrum bands should be earmarked or assigned directly to non-TSP (captive or non-commercial) users.**
4. We are of the firm opinion that with advancement of technologies, there is no justification whatsoever for continuation of **captive (non-commercial/ non-TSP) users.**
5. The licensed Access Service Providers are fully capable of providing all customised solutions including M2M / Industrial 4.0 services in the most competitive and economic manner and in fact providing such network configuration to private and public sector entity.
6. Hence, there is no need to alienate spectrum directly to companies for private captive network.
7. When a captive non-commercial/non-TSP network is part of a commercial network, it addresses the following issues for orderly growth of the sector.
8. This also adheres to the principle of “Same Service Same Rule”. Any move such as setting aside/

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allocation of microwave/E & V (via delicensing or through separate charging mechanism) for catering to the connectivity needs of Industry 4.0 / M2M communication services by way of Private (**non-commercial/ non-TSP users**) Captive Networks, not only truncate the revenues of the licensed service providers but also affect the revenue of the Government. This also creates a non-level playing field pointing to arbitrariness in basic policies scaring away the investors leading to disorderly growth of the sector by back door entry with undue advantage to private commercial entities at the cost government exchequer.

9. Captive Network within the commercial network fulfil the requirement of “Law Enforcement Agencies” as necessary lawful interception and monitoring is provided by the service provider while no such facility is available to LEAs in private captive networks. The anti-social elements may exploit this facility to bypass interception and monitoring of message in the interest of security. Thus, Private Captive Networks are detrimental to national security and should not be permitted.
10. It is pertinent to note that spectrum is a key finite resource with high economic value. The spectrum allocation in any spectrum band that can be used to deploy and provide communication services, irrespective of the entity desiring to use the spectrum or the technology deployed, or type of services offered, should be allocated only through a transparent and open auction process. **Therefore, we do not support delicensing/ reserving any Spectrum bands for Private (non-commercial/ non-TSP users) Captive Networks.**

We urge the Authority not to recommend to reserve or de-license any spectrum which has been identified or likely to be identified for use of Backhaul/

11. Any de-licensing/reservation of spectrum for Industrial use/establishment of private networks, as demanded by few companies, would not only cause huge loss to the exchequer but will also lead to sub-optimal utilization of this scarce resource. Hence, such a move is technically also uncalled for. Sufficient unlicensed spectrum bands are available to cater these private network requirements.
12. Keeping in view the above, we **submit that:**
 - a. In today’s scenario, there is no need for separate private captive networks and same should be dispensed with the availability of state-of art telecommunication network.
 - b. Private Captive Networks are detrimental to national security.
 - c. The licensed Access Service Providers are fully capable of providing these services in most competitive and economic manner compared to private companies looking for such solutions.
 - d. Request the Authority not to recommend to reserve or de-license any spectrum which has been identified or likely to be identified for use of Backhaul/IMT/ commercial i.e. Microwave bands/E & V bands. It amounts to undue advantage to private commercial entities at the cost of government exchequer.
 - e. Any de-licensing/reservation of spectrum for Industrial use/establishment of private Captive networks, as demanded by few companies, would not only cause huge loss to the exchequer but will also lead to sub-optimal utilization of this scarce resource. Hence, such move is not



only technically uncalled for but also legally untenable.

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.

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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?

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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.

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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.

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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?

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(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.

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.

COAI Response (Q29-Q34):

1. It is neither feasible nor advisable to allow low-power indoor device-to-device usage on a license-exempt basis in the V-band alongside licensed telecom service providers deploying access networks. Permitting outdoor license-exempt use is also unnecessary. The V-band is uniquely suited to high-capacity, low-latency 5G access, 5G backhaul and IAB deployment and smart city deployments due to its millimeter-wave characteristics, line-of-sight capabilities, and minimal interference, making it essential to reserve this band exclusively for TSPs. Device-to-device communication should instead rely on existing unlicensed bands like 2.4, 5, and lower 6 GHz, rather than compromising this critical backhaul spectrum.
2. Moreover, the V-band is already standardized under 3GPP Band n263 for IMT and is central to evolving 5G and future IMT-2030 technologies. Delicensing now would disrupt ecosystem development, create regulatory ambiguity, and risk irreversible loss of spectrum value. International experience shows that once delicensed, reclaiming such bands becomes impractical, harming future telecom strategies. Introducing unlicensed use could also degrade spectrum hygiene through interference, undermining network reliability in dense urban deployments. Therefore, no indoor or outdoor license-exempt usage should be permitted in the V-band.

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.

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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.

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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.

&

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.

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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.



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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 $M \times C \times W$ 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.

&

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.

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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.

Q43. In case the E-band (71-76/ 81-86 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.

&

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

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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.

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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.

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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 Eband (71-76/ 81-86 GHz) and/or V-band (57-64/66 GHz)? Please provide detailed information.

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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 $M \times C \times W$ 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.

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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:

(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

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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.



COAI Response (Q35-50):

For telecom operators holding Access Service Authorisation, spectrum for E-band, V-band, and traditional microwave carriers should be assigned at much more rationalized rates. The current pricing is disproportionately high—only about 25% of industry SUC payouts relate to revenue-generating access spectrum, while 75% are incurred for backhaul spectrum that does not create any income but merely supports network operations and this needs to be corrected by rational charging for traditional backhaul and E and V-Band spectrum.
