



VIL/AH/RCA/2024/010

May 24, 2024

**Advisor (Networks, Spectrum and Licensing)**  
**Telecom Regulatory Authority of India,**  
Mahanagar Doorsanchar Bhawan,  
Jawaharlal Nehru Marg (Old Minto Road),  
New Delhi – 110002

**Kind Attn: Shri. Akhilesh Kumar Trivedi**

**Subject:** Comments on the TRAI's Consultation Paper on "Auction of Frequency Spectrum in 37-37.5 GHz, 37.5-40 GHz, and 42.5-43.5 GHz bands Identified for IMT" dated April 04, 2024

Dear Sir,

This is in reference to the TRAI's Consultation Paper on "Auction of Frequency Spectrum in 37-37.5 GHz, 37.5-40 GHz, and 42.5-43.5 GHz bands Identified for IMT" dated April 04, 2024.

In this regard, kindly find enclosed herewith comments from Vodafone Idea Limited on the above-said consultation paper.

We hope our comments will merit your kind consideration please.

Thanking you,  
Yours sincerely,

**For Vodafone Idea Limited**

**Anjali Hans**

**EVP – Regulatory, CSR & External Communications Head**

**Enclosed:** As stated above



## **VII Comments to the TRAI Consultation Paper on “Auction of Frequency Spectrum in 37-37.5 GHz, 37.5-40 GHz, and 42.5-43.5 GHz bands Identified for IMT” issued on 04.04.2024**

At the outset, we are thankful to the Authority for giving us this opportunity to provide our comments to the TRAI Consultation Paper on “Auction of Frequency Spectrum in 37-37.5 GHz, 37.5-40 GHz, and 42.5-43.5 GHz bands Identified for IMT” issued on April 04, 2024.

### **Executive Summary:**

- 1. We submit that TRAI should recommend reserving 37-37.5 GHz, 37.5-40 GHz, and 42.5-43.5 GHz bands for IMT at this stage and track the ecosystem development in the entire available spectrum in each of these frequency ranges. TRAI may review the ecosystem availability after, let's say at least 2 years and then issue a similar consultation like instant one. Our comments to all the questions, in the consultation, may be considered against the backdrop of our above submission.**
- 2. TDD based configuration should be adopted for these frequency ranges under consultation.**
- 3. TSPs should be provided the flexibility to adopt band plans as per requirement. If TRAI intends to recommend band plans as well then, 37 to 40 GHz can be used under n260 band and the balance frequency range can be assigned as n259.**
- 4. The spectrum in bands under consideration should be assigned for a validity period of 20 years.**
- 5. These frequency ranges should be assigned on licensed service area basis only.**
- 6. The block size for these bands being consulted, should be kept as 100 MHz and minimum quantity for bidding should be 1 block of 100 MHz for existing TSP holding access spectrum and 400 MHz for a new entrant with no access spectrum holding.**
- 7. A spectrum cap of 35% is most appropriate for 37-37.5 GHz, 37.5-40 GHz, and 42.5-43.5 GHz bands and there should be a combined cap for these bands put together, as and when spectrum is put up for auction. Further, spectrum cap for 26 GHz band (24.25-27.5 GHz) should not be combined with these bands being consulted in the paper.**
- 8. There should not be any separate MRO for capacity bands in higher GHz ranges.**
- 9. The spectrum should be provided with flexible use, as a service neutral and technology neutral spectrum, giving choice to licensees to deploy it for terrestrial or satellite networks.**
- 10. At this stage, it is very difficult to arrive at any fair value of spectrum for these frequency bands. Any valuation exercise shall not be carried out now and be undertaken at a later stage.**
- 11. The reserve price of spectrum should be set at 50% of the valuation of spectrum.**



12. We recommend that the 2 payment options for successful bidders, provided in NIA, 2024 should continue to be provided. We recommend an additional option, i.e. Option 3, i.e. 6-year moratorium period and no upfront payment, followed by payment of 14 equal annual instalments.
13. In case any interest has to be levied, it should be equivalent to the repo rate prevailing in the country, as repo rate is adequate to protect the time value of money.
14. Any inflation of reserve prices where spectrum remains partially/fully unsold is unjustified and needs to be avoided. In case of partially unsold spectrum in past auction, reserve prices should be kept at the same level as the last auctions. In case of fully unsold spectrum in past auction, reserve prices should ideally be revised downwards.
15. The interest on spectrum instalments should only be applicable from date of issue of the frequency assignment letter and not earlier.
16. We request the Authority to re-emphasize to DoT to come out with a long-term spectrum roadmap in consultation with the industry.
17. 6 GHz band should be made available to the telecom industry at the earliest possible.

In addition to above, we would like to submit our question-wise comments as follows, for the Authority's kind consideration:

#### Question-wise Comments

**Q1. Whether the entire available spectrum in each of the frequency ranges (a) 37-37.5 GHz, (b) 37.5-40 GHz, and (c) 42.5-43.5 GHz, should be put to auction for IMT? If no, please specify the quantum of spectrum in each frequency range to be put to auction. Kindly justify your response.**

**And**

**Q2. In case you are of the opinion that any of the frequency ranges viz. 37-37.5 GHz, 37.5-40 GHz, and 42.5-43.5 GHz should be put to auction at a later date, what should be the timelines for auctioning of such frequency bands for IMT? Kindly justify your response.**

#### **VII Comments to Q1 and Q2.**

1. TRAI, in its consultation paper, has mentioned as below:

*"As per the GSA report<sup>13</sup> on 'mmWave Bands: Global Licensing and Usage for 5G' of November 2020, Band n260, covering 37-40 GHz is also used with 32 companies in six countries/ territories investing in licenses for, or networks using this spectrum. 31 of these companies hold licenses. The majority of these companies are based in the USA and its territories."*

*"...while a device ecosystem is available in the n260 band (37-40 GHz), it does not seem to be readily available in the n259 band (39.5-43.5 GHz). However, once frequency spectrum*



*in n259 band is assigned to service providers, there is a strong likelihood that the device ecosystem in this band will also develop soon.”*

2. Further as per GSA, largely the networks in n260 are deployed in US and with couple of more in Canada, Japan etc. Kindly refer to below table:

Customer	Country	Regions	Frequencies	Status
AT&T Mobility	US	NA	n260 (37000-40000) TDD: Launched	Public (Deploying)
Blue Ridge Wireless	US		n260 (37000-40000) TDD: Licensed	Licensed
DoCoMo Pacific	Guam	Oceania	n260 (37000-40000) TDD: Licensed	5G deployed in network, services launched. Awarded mmWave spectrum in March 2020.
DoCoMo Pacific	Northern Mariana Islands	Oceania	n260 (37000-40000) TDD: Licensed	Launched
East Kentucky Network (Appalachian Wireless)	US	NA	n260 (37000-40000) TDD: Licensed	Launched
Engelbrecht Enterprises	US	NA	n260 (37000-40000) TDD: Licensed	Licensed
High Band Licence Co, LLC	US	NA	n260 (37000-40000) TDD: Licensed	Licensed
Horry Telephone Cooperative	US	NA	n260 (37000-40000) TDD: Licensed	Licensed
LICT Wireless Broadband Company	US	NA	n260 (37000-40000) TDD: Licensed	Licensed
Monarch Wireless	US	NA	n260 (37000-40000) TDD: Licensed	Licensed
NKCN	US	NA	n260 (37000-40000) TDD: Licensed	Licensed
Nsight Spectrum	US	NA	n260 (37000-40000) TDD: Licensed	Licensed
Pine Cellular	US	NA	n260 (37000-40000) TDD: Licensed	Launched
Pioneer Cellular	US	NA	n260 (37000-40000) TDD: Licensed	Licensed
PVT/Fuego Wireless	US	NA	n260 (37000-40000) TDD: Licensed	Licensed
Regina Azucena	US	NA	n260 (37000-40000) TDD: Licensed	Licensed
T-Mobile US (inc. Sprint)	US	NA	n260 (37000-40000) TDD: Launched	Public (Launched)
The Alaska Wireless Network	US	NA	n260 (37000-40000) TDD: Licensed	Licensed
Uintah Basin (Strata Networks)	US	NA	n260 (37000-40000) TDD: Licensed	Launched
Union Wireless	US	NA	n260 (37000-40000) TDD: Licensed	Licensed
US Cellular	US	NA	n260 (37000-40000) TDD: Licensed	Launched
Verizon Wireless	US		n260 (37000-40000) TDD: Launched	5G deployed in network, services launched. Its initial 5G FWA network was non 3GPP compliant. Its 5G mobile network is 3GPP compliant.
VTel	US		n260 (37000-40000) TDD: Licensed	Launched
WATCH Communications	US		n260 (37000-40000) TDD: Licensed	Deploying
Window Wireless	US		n260 (37000-40000) TDD: Licensed	Licensed
Windstream	US		n260 (37000-40000) TDD	Licensed
NTT DoCoMo	Japan	Eastern Asia	n260 (37000-40000) TDD: Evaluating/testing/trialling	Trial license
Terago	Canada	NA	n260 (37000-40000) TDD: Trial Licensed	Evaluating/testing/trialling



3. This demonstrates that even in case of n260 band, the device ecosystem is in nascent stage and is largely limited to US territories. Further, in the n259 band (39.5-43.5 GHz), the device ecosystem is not readily available, both globally, as well as in India.
4. Thus, there is a huge challenge of device ecosystem for n260 and n259 bands as far as the Indian market is concerned.
5. In this regard, it is also important to draw the Authority's attention towards spectrum assignments in 26 GHz in India. The device ecosystem for 26 GHz is still a challenge even after ~2 years of spectrum allocation and thus, this band has been put to skeletal deployments only.
6. The above is contrary to the assumption that allocation to TSPs would lead to the development of the ecosystem, we thus recommend adopting a more pragmatic approach of deferring the auction of spectrum for these bands by few years, so that the device ecosystem develops in more global markets, providing more certainty of the device ecosystem in India, which can eventually enable the TSPs to project a viable business plan.
7. Given the above, if these bands are put to auction now, it would not result in realization of complete potential of proposed spectrum due to ecosystem unavailability. On the contrary, it may lead to undesirable spectrum hoarding by some players. In fact, all such available spectrum when put for auction with affordable reserve prices at a proper time, will incentivize the operators to purchase the spectrum and deploy it to provide enhanced services to the customers.
8. Therefore, we believe that there is presently no case for putting the spectrum in n260 and n259 spectrum bands to auction at this stage. However, the Authority should recommend reserving these bands for IMT at this stage and track the ecosystem development in the entire available spectrum in each of the frequency ranges 37-37.5 GHz, 37.5-40 GHz, and 42.5-43.5 GHz. The Authority may review the ecosystem availability after, let's say atleast 2 years and then issue a similar consultation like instant one.
9. Hereinafter, while we are providing comments to all other questions however, our basic premise remains that the instant spectrum bands should not be put to auction as of now and device ecosystem availability should be reviewed by TRAI after a couple of years.

**Q3. Do you agree that TDD-based duplexing configuration should be adopted in the country for the frequency ranges under consideration viz. (a) 37 - 37.5 GHz, (b) 37.5 - 40 GHz, and (c) 42.5 - 43.5 GHz, for IMT? If yes, considering that there is an overlap of frequencies in the band plans n260 (37-40 GHz) and n259 (39.5-43.5 GHz), how should the band plan(s) along with its frequency range be adopted? Kindly justify your response.**

#### **VII Comments to Q3.**

1. TRAI, in its recommendations regarding the adoption of TDD based configuration for 24.25 to 28.5 GHz frequency range discussed in the consultation paper on "Auction of Spectrum in frequency bands identified for IMT/5G", stated as below:



*"...there are three band plans i.e., n257 (26.5 GHz to 29.5 GHz), n258 (24.25 to 27.50 GHz) and n261 (27.50 to 28.35 GHz). All the three band plans are TDD-configuration based. Higher frequency bands are generally used for enhancing capacity and lowering latency. TDD based configuration gives the flexibility to decide the ratio between uplink and downlink based on the use case, the spectrum is being deployed. Further, 3GPP has defined this band only for TDD configuration-based band plans in mmWave spectrum bands."*

*"Considering the global trend and 3GPP TDD configuration-based band plans availability, the Authority recommends that TDD based configuration should be adopted for spectrum 24.25 to 28.5 GHz."*

2. We submit that TDD configuration has already established itself as more efficient through using common spectrum pool for both DL and UL operation without any need of the guard band which is required in FDD systems. Also, mmWave spectrum bands are expected to be deployed where there is a very high demand of data services and as has been observed, based on internet traffic trends since 4G days, most of the data traffic is downlink centric. Hence, deploying spectrum in TDD configurations will ensure efficient utilization of spectrum.
3. In addition to above, we also submit that TDD requires less channel estimation time i.e. to estimate DL channel via uplink channel state information. This way operations like mMIMO and beamforming can be implemented very easily and efficiently.
4. Also, configuration for present 3GPP defined spectrum bands for frequencies >3GHz is TDD mode. Bands n257, n258 and n261 which are all covering the spectrum range between 24 - 29.5 GHz, are also TDD in configuration. The same also applies for the n259 and n262 which cover the 40 GHz range.
5. Therefore, we recommend that TDD based configuration should be adopted for the frequency ranges under consideration viz. (a) 37 - 37.5 GHz, (b) 37.5 - 40 GHz, and (c) 42.5 - 43.5 GHz, for IMT, when this is put up for auction.
6. Further, regarding the band plan(s) adoption along with its frequency range considering that there is an overlap of frequencies in the band plans n260 (37-40 GHz) and n259 (39.5-43.5 GHz), the GSA data, provided in table in comments to Question 1 above, presently it shows that networks are already deployed on the n260 band in US, Canada, Guam and Japan, although it is quite nascent and largely US centric.
7. We recommend that:
  - a. TSPs should be provided the flexibility to adopt band plans as per requirement.
  - b. In case Authority intends to recommend band plans as well then, considering the current ecosystem and global deployments, 37 to 40 GHz can be used under n260 band and the balance frequency range can be assigned as n259. The global n260 band ecosystem will prove beneficial to India if 37-40 GHz is classified as n260 band in India.



**Q4. Whether the spectrum in the frequency ranges under consideration viz. (a) 37-37.5 GHz, (b) 37.5-40 GHz, and (c) 42.5-43.5 GHz should be assigned for a validity period of 20 years, as prevalent in the existing frequency bands, or for a shorter validity period? In case you are of the opinion that a shorter validity period should be adopted, please suggest the validity period? Kindly provide your response with detailed justifications.**

**VIL Comments to Q4.**

1. As per the existing licensing and regulatory framework in India, access spectrum is assigned to access service licensees with a validity period of 20 years. DoT in its recent Notice Inviting Applications For "Auction of Spectrum in 800 MHz, 900 MHz, 1800 MHz, 2100 MHz, 2300 MHz, 2500 MHz, 3300 MHz, and 26 GHz Bands" dated March 08, 2024 has also mentioned that the validity period of right to use of the spectrum in 800 MHz, 900 MHz, 1800 MHz, 2100 MHz, 2300 MHz, 2500 MHz, 3300 MHz, and 26 GHz bands won in the upcoming auction shall be 20 years.
2. In case of the frequency ranges under consideration viz. (a) 37-37.5 GHz, (b) 37.5-40 GHz, and (c) 42.5-43.5 GHz bands, TRAI in this consultation paper has mentioned as below:

*"Considering that the new spectrum bands being identified for IMT, particularly the higher spectrum bands, where ecosystem is not fully developed and such frequency bands are yet to find adequate use cases, there could be difficulty in assessing the true value of spectrum in such frequency bands. Therefore, the aspect of the period of validity for such spectrum bands requires examination."*

3. One of the biggest costs in telecom network and infrastructure, is spectrum. Further, telecom networks planning and deployment is a multi-year process and it also puts huge capex and opex pressure on the telecom operator. Once this is done, the TSP utilizes the following years to provide enhanced services to its consumers and also get return on investments.
4. Thus, it is imperative that the spectrum validity has to be such that it provides adequate time for ecosystem penetration, network planning and deployments as well as substantial period for providing commercial services through the deployed networks thus, enabling adequate certainty to a TSPs business plans.
5. TRAI, in respect of study of international scenario in this paper, has also stated that in some countries, validity period of spectrum has been shortened for mmWave bands. However, in India policies are already in place allowing spectrum trading after 2 years and spectrum surrender after 10 years. So, a TSP has the option to part with the spectrum before the 20 years validity, after duly following the trading or surrender policy.
6. Hence, the spectrum in the frequency ranges under consideration viz. (a) 37-37.5 GHz, (b) 37.5-40 GHz, and (c) 42.5-43.5 GHz bands should be assigned for a validity period of 20 years, once it is put up for auction.

**Q5. Whether the spectrum in (a) 37-37.5 GHz, (b) 37.5-40 GHz, and (c) 42.5-43.5 GHz frequency ranges should be assigned for the existing licensed service areas (LSAs) for Access Service (i.e. Telecom Circles/ Metros), or it should be assigned for smaller service areas? In case you are of the**



opinion that the spectrum in these bands should be assigned for smaller service areas, please suggest the criteria for defining such service areas? Kindly provide your response with detailed justifications.

#### VIL Comments to Q5.

1. We recommend that the spectrum should be assigned on LSA basis only, irrespective of spectrum band or different authorizations under Unified License. This will maintain uniformity across different domains and ensure level-playing field in between different licensees.
2. While sub-LSA allocations may appear to support lowering of spectrum acquisition costs in short term but, it will cause more harm in the longer term. Sub-LSA assignments would create complexities for network deployments and also cause inconsistency in factors like spectrum cap, block-size, valuation, harmonized frequencies etc. The calculation of monetary levies like SUC on a weighted average basis would also be a complex activity.
3. Further, a sub-LSA approach would also lead to spectrum fragmentation causing under-utilization and TSPs may not be able to deploy nation-wide or LSA-wide networks and enjoy economies of scale due to disjointed spectrum holdings.
4. In addition to the above, assignment of spectrum for smaller service areas may also give rise to the digital divide as it will lead to provision of network coverage in select pockets i.e. densely populated urban areas, leaving the rural and semi-urban areas uncovered.
5. Therefore, we recommend that the spectrum in (a) 37-37.5 GHz, (b) 37.5-40 GHz, and (c) 42.5-43.5 GHz frequency ranges should be assigned on licensed service area basis only, once they are put up for auction.

**Q6. What should be the block size, and the minimum quantity for bidding in (a) 37-37.5 GHz, (b) 37.5-40 GHz, and (c) 42.5-43.5 GHz frequency ranges? Kindly justify your response.**

#### VIL Comments to Q6.

1. With reference to block-size for 24.25-28.5 GHz band, TRAI, in its recommendations on "Auction of Spectrum in frequency bands identified for IMT/5G" dated April 11, 2022, stated as below:

*"As per the standard frozen by 3GPP7 [ETSI TS 138 104 V16.6.0 (2021-01)], for 5G NR bands n257 and n258, the supported channel bandwidth is 50 MHz, 100 MHz, 200 MHz and 400 MHz."*

2. Further, even after acknowledging that most of the stakeholders had suggested block size of 100 MHz for 24.25-28.5 GHz band, TRAI recommended that block size for 24.25-28.5 GHz band be kept as 50 MHz basis the following analysis:

*"Total spectrum available in 24.25-28.5 GHz band is 4250 MHz, which is in the multiples of 50 MHz. Therefore, the Authority is of the view that the block size for 24.25-28.5 GHz*





*band may be kept as 50 MHz, else 50 MHz will not be able to put to auction and remain unsold.”*

3. In the extant case for 37-37.5 GHz, 37.5-40 GHz, and 42.5-43.5 GHz bands, the quantum of spectrum available in these frequency ranges is 500 MHz, 2500 MHz and 1000 MHz respectively. It is clear that the total spectrum available is in the multiples of 50 MHz as well as 100 MHz.
4. Further, these bands are used for capacity augmentation and thus, are always preferred in bigger chunks such that they can provide a bigger pipe to address the needs of high-density areas as such. Thus, block-size of 100 MHz would be preferable over a block-size of 50 MHz from a technical perspective.
5. Also, considering the availability of spectrum in these bands, minimum quantity for an existing TSP holding access spectrum, should be kept as 1 block else it may lead to unsold spectrum which will be wastage of a national resource. For new entrant with no access spectrum holding, minimum 4 blocks i.e. 400 MHz should be made minimum quantity, to ensure they provide reasonable service experience to consumers.
6. In addition to above, it is also important that if an operator is already having blocks of the spectrum in a particular band, and they acquire additional block in the same band, the Government should strive to ensure contiguity of the holdings so as to ensure efficient utilization of spectrum and better user experience.
6. Therefore, as and when the instant spectrum bands are put up for auction, we recommend:
  - a. The block size should be kept as 100 MHz; and
  - b. Minimum quantity for bidding should be 1 block of 100 MHz for existing TSP holding access spectrum and 400 MHz for a new entrant with no access spectrum holding.

**Q7. What provisions with respect to the spectrum cap per service provider in a licensed service area (LSA) should be made applicable for the frequency ranges under consideration viz. (i) 37-37.5 GHz, (ii) 37.5-40 GHz, and (iii) 42.5-43.5 GHz for IMT? Specifically, -**

**(a) Whether there is a case for a combined spectrum cap for 26 GHz band (24.25-27.5 GHz) and the frequency ranges under consideration? If yes, what should be the spectrum cap? Kindly justify your response.**

**(b) In case your response to (a) above is in the negative, whether spectrum cap should be prescribed separately for each frequency range viz. (i) 37-37.5 GHz, (ii) 37.5-40 GHz, and (iii) 42.5-43.5 GHz, or these frequency ranges should be combined for applicability of spectrum cap? What should be the spectrum cap(s)? Kindly justify your response.**

**VIL Comments to Q7.**

**Spectrum Cap Value**



1. The last TRAI recommendations dated 11.04.2022 as well as subsequent Notice Inviting Applications for "Auction of Spectrum in 800 MHz, 900 MHz, 1800 MHz, 2100 MHz, 2300 MHz, 2500 MHz, 3300 MHz, and 26 GHz Bands" issued by DoT on June 15, 2022, spectrum caps have been set as follows:
  - *A Cap of 40% on the combined spectrum holding in the sub-1 GHz bands i.e. 700 MHz, 800 MHz and 900 MHz bands, including existing spectrum holding of TSPs in these bands.*
  - *A Cap of 40% on the combined spectrum holding in 1800 MHz, 2100 MHz, 2300 MHz and 2500 MHz bands, including existing spectrum holding of TSPs in these bands.*
  - *A Cap of 40% on the spectrum holding in 3300 MHz band including existing spectrum holding of TSPs (rounded off considering the block size in this band).*
  - *A Cap of 40% on the total spectrum holding in 26 GHz band including existing spectrum holding of TSPs (rounded off considering the block size in this band).*
2. In our view, a cap of 40% leads to reduction in equitable availability of spectrum for even 3 TSPs over a period of time. While larger players may exercise their right of purchasing the spectrum till the spectrum cap value in the first auction itself, which will not leave adequate spectrum for other TSPs who may want to purchase spectrum till the spectrum cap value, over a period of few auctions. Availability of lesser spectrum certainly impacts the competitive structure of the market in longer term.
3. Furthermore, the reservation of spectrum for the PSU TSP, reduces the overall availability of spectrum being put to auction and further skews the competitive availability of spectrum in favour of larger TSPs.
4. Therefore, it is important to put in place a balance between revenue realization by the Government through more spectrum purchase by larger players v/s maintaining an effective competitive structure in the market through equitable availability of spectrum for all TSPs.
5. **Keeping above in view, we recommend that as and when spectrum is put up for auction, a spectrum cap of 35% is most appropriate as it balances both the objectives of providing bidding activity as well as equitable availability of spectrum for all TSPs in present market structure.**

**Spectrum cap combined or separate within these bands**

6. Further, spectrum in 37-37.5 GHz, 37.5-40 GHz, and 42.5-43.5 GHz bands are of similar spectral efficiency and propagation characteristics as well as similarly placed nascent or no device ecosystem hence, **there should be a combined cap for these bands put together.**

**Spectrum cap combined or separate with 26 GHz**

7. At present, there is very less spectrum available in 26 GHz. Also, the spectral efficiency, global network deployments and device ecosystem in 26 GHz is different than these bands under consideration.
8. If spectrum cap of both 26 GHz and the instant bands being consulted is allowed to be combined, it will allow a TSP to purchase more spectrum in 26 GHz.



9. Most importantly, 26 GHz band (24.25-27.5 GHz) was put to auction in 2022, wherein ~72% of the frequency spectrum got sold and very less amount is left. The NIA 2022 prescribed 40% spectrum cap for 26 GHz and thus, the spectrum purchase and its business plans were made considering the 40% spectrum cap in this band, which may include purchasing spectrum over multiple auctions. As such, we request consistency in spectrum policy positions should be maintained and spectrum cap for 26 GHz and spectrum bands being considered in this paper, be kept separate.
10. To prevent concentration of spectrum in some bands with 1-2 operators, we recommend that spectrum cap for 26 GHz band (24.25-27.5 GHz) should not be combined with the bands being discussed in the present consultation paper.

**Q8. What should be the roll-out obligations for the assignment of spectrum in (a) 37-37.5 GHz, (b) 37.5-40 GHz, and (c) 42.5-43.5 GHz frequency bands for IMT? Kindly justify your response.**

**VII Comments to Q8.**

1. Since the spectrum in higher GHz bands are used primarily for capacity enhancements and not for coverage, as such, there should not be any roll-out obligations for these spectrum bands.
2. TRAI in its previous recommendations dated 11.04.2022 has recommended that there should be nominal network deployment-based roll-out obligations in 37-37.5 GHz, 37.5-40 GHz and 42.5-43.5 GHz frequency bands. However, this condition also needs to be reviewed especially considering the experience of 26 GHz, which has been purchased by TSPs but, even after two years there has been skeletal network deployment due to lack of device ecosystem. Also, it's very challenging to put a timeline for deployment of networks in these higher bands and hence, for initial 4-5 years, rollout timelines become meaningless.
3. Therefore, we recommend that there should not be any separate MRO for capacity bands in higher GHz range. It would be apt if the existing provisions i.e. MRO met in any band and technology, shall suffice MRO conditions for each of the spectrum band held by a TSP including the instant spectrum being considered under this paper. This MRO will be all encompassing and would ensure meaningful coverage to consumers at large.
4. However, if the Authority still decides to specify any rollout obligation specific for these bands, like in the case of 24.25-28.5 GHz, the time-period of the first phase should start once enough device ecosystem is achieved, let's say only after 5 years.

**Q9. Whether the eligibility conditions and associated eligibility conditions for participation in the auction for 37-37.5 GHz, 37.5-40 GHz, and 42.5-43.5 GHz should be kept analogous to the eligibility conditions and associated eligibility conditions for participation in the auction for spectrum for IMT, as defined in NIA 2024? In case your response is in the negative, suggestions may kindly be made with detailed justification.**



#### VII Comments to Q9.

Existing eligibility conditions for IMT bands have been in place for quite some time and same should continue for 37-37.5 GHz, 37.5-40 GHz, and 42.5-43.5 GHz bands, as and when put up for auction. Further, no minimum network criteria should be there for existing licensees holding IMT spectrum.

**Q10. To mitigate inter-operator interference due to TDD-based configuration, whether the approach adopted for 3300-3670 MHz and 26 GHz bands should also be made applicable for the frequency ranges under consideration viz. 37-37.5 GHz, 37.5-40 GHz, and 42.5-43.5 GHz, or some other provisions need to be created? In case you are of the opinion that some other provisions are required to be created, suggestions may be made with detailed justification.**

#### VII Comments to Q10.

1. The Authority in its recommendations on "Auction of Spectrum in frequency bands identified for IMT/5G" dated April 11, 2022 recommended the following approach for 3300-3670 MHz and 26 GHz bands to mitigate inter-operator interference in TDD configuration bands:
  - a. *In case a TSP acquires more than one block, the entire spectrum should be assigned to it in contiguous form.*
  - b. *In case a TSP acquires spectrum in more than one LSA, same frequency spots should be assigned to it in all those LSAs, to the extent possible.*
  - c. *Interference mitigation be left to the mutual coordination between the TSPs.*
2. For the 37-37.5 GHz, 37.5-40 GHz, and 42.5-43.5 GHz bands as well, we recommend same conditions should prevail and interference management should be left to mutual coordination between TSPs. Also, contiguous spectrum assignment will also help reduce the chances of interference to a large extent.

**Q11. Whether there could be any challenges in sharing of 37.5-40 GHz and 42.5-43.5 GHz spectrum frequency ranges between IMT and Satellite Gateway links? If yes, what challenges do you foresee and what measures could be adopted to mitigate such challenges? Kindly justify your response.**

And

**Q12. In case it is decided to share (i) 37.5-40 GHz, and (ii) 42.5-43.5 GHz spectrum frequency ranges between IMT and Satellite Gateway links, -**

- (i) **Whether there is a need to prescribe a protection/ keep-off distance between IMT stations and Satellite Earth Station Gateways? If yes, what should be the protection distance?**
- (ii) **What other parameters should be prescribed for the coexistence of IMT and Satellite Gateway links?**

**Suggestions may kindly be made with detailed justification.**



#### **VII Comments to Q11 and Q12.**

1. We do not foresee any challenges in coexistence of sharing of bands between IMT and Satellite as mmWave network deployment is expected to be more focused on meeting capacity demand in selective geographies. It is important to note that high propagation loss makes seamless coverage a challenge in these bands and hence, the deployments will be more likely to be kind of hotspots, urban micro cells and FWA. Network deployment in mmWave is not likely to be ubiquitous.
2. Further, the convergence of technologies and permitting flexible use of spectrum will enable the service providers to use the spectrum for both IMT & satellite-based services based on the capacity and coverage requirements in various geographies i.e. Urban & Rural/Remote areas. Allowing flexible use and permitting spectrum sharing with other service providers will result in full utilization and efficient use of the spectrum in all the LSAs. Enabling flexible use of spectrum will also help the service providers to plan their networks such that interference issues are effectively mitigated without causing degradation in quality of service to the customers and without any coordination required from the government.
3. Hence, the propagation characteristics of mmWave spectrum bands are such that the signal range is very small and the use cases it will support, are likely to be area specific and therefore, coexistence should not be an issue. Also, any spectrum requirements of satellite players can be met through spectrum leasing and mutual co-ordination between TSPs.
4. Therefore, the spectrum should be provided with flexible use, as a service neutral and technology neutral spectrum, giving choice to licensees to deploy it for terrestrial or satellite networks.

**Q13. Whether the value of spectrum in 37–37.5 GHz, 37.5–40 GHz and 42.5–43.5 GHz spectrum bands be derived by relating it to the auction determined price/value of spectrum in any other band by using spectral efficiency factor? If yes, with which spectrum band, should these bands be related and what efficiency factor or formula should be used? Please justify your suggestions.**

**And**

**Q14. Should international spectrum prices i.e. the auction determined price/ reserve price of other countries in 37 – 37.5 GHz, 37.5 – 40 GHz and 42.5 – 43.5 GHz spectrum bands serve as a basis for the purpose of valuation of these bands? If yes, what methodology can be followed in this regard? Please provide detailed information.**

**And**

**Q15. Apart from the approaches highlighted above which other valuation approaches should be adopted for the valuation of 37 – 37.5 GHz, 37.5 – 40 GHz and 42.5 – 43.5 GHz spectrum bands? Please support your suggestions with detailed methodology, related assumptions and other relevant factors, etc.**

**And**



**Q16. Whether the value arrived at by using any single valuation approach for a particular spectrum band should be taken as the appropriate value of that band? If yes, please suggest which single approach/ method should be used. Please support your answer with detailed justification.**

**And**

**Q17. 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 a particular spectrum band, or some other approach like taking weighted mean etc. should be followed? Please support your answer with detailed justification**

**VII. Comments to Q13, Q14, Q15, Q16 and Q17.**

1. It may be noted that the 37-37.5 GHz, 37.5-40 GHz, and 42.5-43.5 GHz spectrum bands would be auctioned for the first time in India and there is no historical auction data available for conducting comparative analysis involving auction-determined prices in India. Therefore, the valuation methodologies utilized by TRAI in the past cannot be applied to the valuation of the 37-37.5 GHz, 37.5-40 GHz, and 42.5-43.5 GHz frequency bands due to the absence of data related to these spectrum bands.
2. Internationally also, there are only few countries which have successfully done auction-based allocation of the spectrum in 37-37.5 GHz, 37.5-40 GHz, and 42.5-43.5 GHz frequency bands and India as a country presents a different set of opportunities and challenges. Hence, International benchmarking method may not also be an appropriate method in the current scenario.
3. Lack of device ecosystem have led to almost nil monetization and negative returns on the investment for the operators who have acquired the spectrum in 26 GHz band. Due to this, currently there is no clarity on the value which may be derived by the operators out of the spectrum in 26 GHz band. Hence, the winning prices in the last auction or the reserve prices for the 2024 auction cannot be considered as fair value of the spectrum in the 26 GHz band and should not be used as benchmark for determining the value of spectrum in 37-37.5 GHz, 37.5-40 GHz, and 42.5-43.5 GHz frequency bands.
4. We reiterate the comments to the earlier question(s) where we have submitted that spectrum in 37-37.5 GHz, 37.5-40 GHz, and 42.5-43.5 GHz frequency bands should not be put to auction for at least another 2 years, post which, a fresh exercise of examination of global device ecosystem should be carried out, followed by fresh consultation process.
5. Considering above, we submit that the valuation exercise for these bands shall be carried out closer to the date of proposed auction.
6. Considering all above, we recommend that at this stage, it is very difficult to arrive at any fair value of spectrum in 37-37.5 GHz, 37.5-40 GHz and 42.5-43.5 GHz frequency bands. We submit that any valuation exercise shall not be carried out now and should be undertaken at a later stage.



**Q18. What ratio should be adopted between the reserve price for the auction and the valuation of the spectrum in these spectrum bands and why? Please support your answer with detailed justification.**

**VII Comments to Q18.**

1. Higher reserve price generally discourages competitiveness and bidding activity in the auction, leading to lower participation as well as lower sale. Also, on the other hand, a very low reserve price may hamper the realization of the true value, bring in non-serious players/spectrum hoarders or encourage spectrum hoarding.
2. In order to ensure competitive bidding and price discovery, the reserve price should not be too close to the expected/predicted valuation of the object put up for auction. The level at which reserve prices are set has implications for each of the objectives normally set for spectrum auctions: efficiency, competition, transparency, market development, and Government revenue.
3. Considering above, we would like to submit that the reserve price of spectrum should be set at 50% of the valuation of spectrum, as and when the instant spectrum is put up for auction. The same is an optimum level to encourage wider participation of the TSPs in acquisition of spectrum.

**Q19. What should the payment terms and associated conditions for the assignment of 37 – 37.5 GHz, 37.5 – 40 GHz and 42.5 – 43.5 GHz spectrum bands relating to:**

- i. **Upfront payment**
  - ii. **Moratorium period**
  - iii. **Total number of installments to recover deferred payments**
  - iv. **Rate of discount in respect of deferred payment and prepayment**
- Please support your answer with detailed justification.**

**VII Comments to Q19.**

1. The terms of payment are as important as the reserve prices. Keeping in mind the financial stress faced by the industry, the payment terms should be such that it supports both investments as well as network deployment, rather than revenue collection. Significant amount of capital expenditure will be required for deployment.
2. TRAI, in its last recommendations i.e. on “Auction of Spectrum in frequency bands identified for IMT/5G” dated April 11, 2022 had recommended the following flexible payment options:
  - a. *Option I: Full or part upfront payment of the bid amount within 10 days of declaration of final price;  
Where part upfront payment has been made, the buyer shall have the option of availing moratorium for the proportionate number of years for which the upfront payment has been made, and the balance amount shall be payable in equal annual instalments over the remaining period in advance at the beginning of the year, after the period of moratorium if any (duly protecting the net present value of the bid*







7. **Total number of installments to recover deferred payments:** As mentioned above, there should be an additional option with 6-year moratorium period and no upfront payment, followed by payment of 14 equal annual instalments. The same will enable TSPs to invest in network rollout.
8. **Rate of Interest in case of Deferred Payment and Prepayment:** In the current scenario, Marginal Cost of Funds based Lending Rates (MCLR) is widely used benchmark rate. However, the obligation to pay huge interest on deferred spectrum payments ultimately burdens the TSPs' finances and impairs their ability to make investments for network rollout, thus defeating the purpose of providing a moratorium. **Therefore, we recommend that in case interest has to be levied, it should be equivalent to the repo rate prevailing in the country, as repo rate is adequate to protect the time value of money (as opposed to SBI PLR/MCLR, which imposes an unwarranted financial burden on TSPs).**

**Q20. Any other suggestion relevant to the subject, may be submitted with detailed justification.**

**VII Comments to Q20.**

**1. 6 GHz:**

- a. As per GSMA, TSPs require atleast 2 GHz spectrum to provide meaningful coverage and capacity to the consumers. 6 GHz is the only mid-band spectrum range where a contiguous bandwidth to the order of 300-400 MHz per TSP is possible, and can provide a balance of coverage and capacity and global device ecosystem is also far more developed and matured.
- b. Therefore, at this stage, telecom industry require spectrum in 6 GHz band (i.e. entire 5925-7125 MHz, totaling 1200 MHz), which would be ideal for commercial success and deployment of next generation technologies.
- c. Currently, only 720 MHz is available in the mid-band in India. We understand that the Government is considering vacating further spectrum in C band i.e. 3670-4000 MHz. However, even this spectrum from C band will not be enough to reach the required 2GHz spectrum for IMT in mid-band. It is essential that all 1200 MHz available in 6GHz is allocated for mobile communications in India to get this critical 2GHz spectrum in mid-band.
- d. **Therefore, we request TRAI to recommend to the Government that 6 GHz should be made available to the telecom industry at the earliest possible and the instant spectrum under consultation to be re-examined for auction after some time let's say 2 years.**

**2. No indexation of Auction-Determined Prices in case Spectrum remains Partially Unsold:**

- a. The Authority, in its Recommendations on "Auction of Spectrum in frequency bands identified for IMT/5G" dated April 11, 2022, had recommended that a fresh spectrum valuation exercise be conducted once every three years for existing bands. For auctions conducted in between such periodic valuation exercises, the last auction-determined prices should be duly indexed at MCLR for arriving at the reserve prices for the LSAs where the spectrum put to auction in



the previous auctions was sold and more than one year has elapsed since the last auction. Further, for the LSAs where spectrum remained unsold in previous auction, it was recommended to use the last reserve prices without any indexation.

- b. In this regard, we would like to submit that indexing the last auction-determined prices would lead to inflation of the reserve prices significantly. The same has been witnessed during the past few auctions, wherein steep reserve prices have led to substantial portions of the spectrum on offer going unsold.
- c. In such situation, the available spectrum which was not fully sold represent lack of demand at current prices. As such, increasing the reserve prices (auction-determined prices indexed at MCLR) would be counter-productive and will not meet objectives of government or the industry.
- d. The spectrum that is left unsold and remains unused, signifies a missed socio-economic opportunity for the nation. If auctioned, it could have been utilized to enhance network capacities, keeping pace with the escalating data usage, and extending services into remote rural areas to narrow the digital divide. Therefore, **any inflation of reserve prices where spectrum remains partially/fully unsold is unjustified and needs to be avoided**. Further, the primary focus should be to ensure sufficient spectrum availability at reasonable prices, regardless of the outcomes of previous auctions.
- e. **Accordingly, we request the following:**
  - i. **In case of partially unsold spectrum in past auction, reserve prices should be kept at the same level as the last auctions.**
  - ii. **In case of fully unsold spectrum in past auction, reserve prices should ideally be revised downwards.**

### 3. Calculation of Interest on Spectrum Installments:

- a. As per current practice on spectrum auctions, DoT has a 30-day window from the date of first payment to issue a frequency assignment letter. However, interest on the remaining amount becomes applicable even before the issue of the frequency assignment letter. This is unfair to the TSPs.
- b. **We submit that the interest on spectrum instalments should only be applicable from the date of issue of the frequency assignment letter and not earlier.**

### 4. Spectrum Roadmap:

- a. We submit that there is a critical need to define the long-term spectrum roadmap, for at least a period for 10 years, which will provide certainty to the business plans and technology evolutions, as chosen by TSPs.
- b. TRAI in its Recommendations on 'Auction of spectrum in frequency bands identified for IMT/5G dated April 11, 2022 has mentioned the need for spectrum roadmap stated as below:



*“Considering that there are certain additional bands which are already identified by ITU for IMT services and few additional bands are under consideration in WRC-23 for IMT identification, the Authority recommends that DoT should explore the possibility to make these bands available for IMT services at the earliest and come out with a spectrum roadmap for opening up of new bands for IMT to meet the future demand. At least a 5-year roadmap on spectrum likely to be made available for IMT in each year and likely date/month of auction should be made public. Such a spectrum roadmap will provide certainty, enable the bidders to take informed decisions and may also encourage new entrants.”*

- b. This roadmap will help clarify quantum and timeline of spectrum availability, facilitating the TSPs to plan their investments in near term to long term. The roadmap may also include details regarding the harmonization of future spectrum which will be beneficial in reduction of equipment costs and limiting the possibility of interference.
- c. **Therefore, we request the Authority to re-emphasize to DoT to come out with a long-term spectrum roadmap in consultation with the industry.**

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