

1178 / TRAI/ ISPAI /24-006
May 24, 2024

Shri Akhilesh Kumar Trivedi,
Advisor (Network, Spectrum and Licensing),
Telecom Regulatory Authority of India,
Mahanagar Doorsanchar Bhavan,
Old -Minto Road, Near Zakir Husain College,
New Delhi – 110 002

Subject: ISPAI Response to 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”

Dear Sir,

We congratulate the Authority to have come out with this Consultation paper on the matter captioned above and sincere thanks for providing us the opportunity to submit our response on this important issue.

We have enclosed our comprehensive response for your consideration.

We believe that the Authority would consider our submissions positively on the subject matter.

Thanking you,

With Best Regards,
For Internet Service Providers Association of India



Rajesh Chharia
President
+91-9811038188
rc@cjnet4u.com

Encl: As above

ISPai Response to TRAI CP on Auction of Frequency Spectrum in 37-37.5 GHz, 37.5-40 GHz, and 42.5-43.5 GHz bands Identified for IMT

The Hon'ble PM's '**Digital India**' vision to transform the country into a digitally empowered society and knowledge economy requires **enabling regulatory and business environment** specifically on extensive usage of IMT bands. **access to sufficient spectrum should be ensured** with right regulatory conditions specifically with **37-37.5 GHz, 37.5-40 GHz and 42.5-43.5 GHz bands** to be reserved for IMT usage since these can be used for proliferation of IMT-based broadband services.

These bands are capable of delivering extremely high data rates due to their wide bandwidth. It may be noted that these new bands are also classified as mmWave spectrum, like 26 GHz band and together these will enable **further expansion of 5G/FWA services in the country**. Since Telcos acquired the 26GHz band across all LSAs in the 2022 Auctions and are now at various stages of deployment. Hence, it is important that **these bands be put up for auction** as soon as possible.

However, before putting these bands to auction, it needs to be ensured that spectrum bands are clean, interference free and free of exclusion zones (if any) or limited exclusion zones. This is because some of the frequencies within these bands may also be used for satellite operations (in addition to IMT). Specifically, the 37-38 GHz range is utilised for Space Research Services (SRS), the range 37.5-40 GHz facilitates hub operations (satellite to earth) and the range from 42.5-43.5 GHz is used for hub operations (earth to satellite) as well as Radio Astronomy Services (RAS).

In terms of spectrum valuation, the Authority's spectrum pricing exercise must emerge from the industry's incremental/aggregate RoCE and incremental/marginal revenue generation ability in the spectrum band(s) being valued. Each band should be valued based on its economic value and business case using the marginal revenue approach. Alternatively, since these spectrum bands will be auctioned for the first time in India, the valuation of these bands can be estimated by considering the combined weightage of the market value of 26GHz used in the most recent auction and its contribution to the revenue generation. This value should be further discounted to adjust for the comparative efficiency and propagation loss of these bands compared to the 26GHz band. **The reserve price should be taken as 50% of the valuation of the spectrum.**

The international spectrum prices of other countries should not be used to serve as a basis for the valuation of these bands due to the level of maturity of the network and the social and economic parameters of India when compared with the referred international countries.

The allocation of spectrum bands should be consistent with the present licensing regime of Licensed Service Area (LSA) based allocation as the telecom networks have developed and designed basis LSA based regime.

Licensees that have met the rollout obligations once in 26 GHz band, should not have the obligations again in these bands. These should only be prescribed for an entity having no access to the mmWave spectrum band earlier.

Since the spectrum also has a coexistence requirement with the satellite services, an appropriate **protection/keep-off distance** may be prescribed between IMT stations and Satellite Earth Station

Gateways. Also, prior to the auctions, the list of present/planned locations of satellite hub stations should be made available. Post auctions, a new hub station should be allowed to be established only in isolated areas with no existing IMT base station.

The **eligibility conditions for participation in the auction** should be in line with those prescribed for existing spectrum bands in the NIA 2024.

The payment terms and conditions should ensure orderly and sustainable growth of the industry.

The block size should be 100 MHz. The minimum bidding quantity should be 400 MHz for new entrants who do not hold any spectrum in any mmWave band and 100 MHz for existing operators who already hold spectrum in any of the mmWave spectrum bands.

The validity period of spectrum assigned should continue to be for 20 years.

- 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.**
- 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.**

Response –

Yes, all 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 at the earliest.

The availability of these three new frequency ranges, in addition to the 26 GHz band, will enable the further expansion of 5G/FWA services in the country. These bands have already been identified as the IMT bands and hence their increased usability for TSPs will only help accelerate the ecosystem development. Therefore, auction these bands at the earliest.

It is highlighted at the outset that as early as in 2022, the Authority, in its Recommendations¹ related to the 2022 Auctions (for IMT/5G bands), had itself observed that the frequency ranges 37-40 GHz bands have already been identified for IMT services by ITU, and thus these bands should be made available for IMT services in India at the earliest.

However, some of the frequencies within these bands may also be used for other purposes, specifically Fixed Satellite Services (FSS), Space Research Services (SRS) etc. Accordingly, prior to auctions, adequate data should be made available to TSPs regarding present/planned locations of SRS/satellite hub stations. This should be done in a time-bound manner, so that these bands can be put to auction at the earliest.

In summary the following should be ensured:

¹ "Auction of Spectrum in frequency bands identified for IMT/5G", 11 April 2022

- (i) 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.
- (ii) Availability of clean spectrum is crucial before auctioning. Hence, adequate information and necessary data regarding present/planned locations of SRS/satellite hub stations should be made available to TSPs.

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.

Response –

Yes, TDD-based duplexing 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.

The TDD-based configuration has been globally adopted for mmWave band spectrum. Since the device ecosystem is developed at a global level, it is appropriate to follow international standards in this regard.

Further, considering that there is an overlap of frequencies in the band plans n260 (37-40 GHz) and n259 (39.5-43.5 GHz), the operator should be free to choose any band plan as per 3GPP, depending on the availability of device ecosystem.

Therefore:

- (i) TDD-based configurations should be adopted for all the three frequency ranges (a) 37-37.5 GHz, (b) 37.5-40 GHz, and (c) 42.5-43.5 GHz, for IMT.
- (ii) The choice of band plan should be left to the operator.

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.

Response –

Yes. 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 only, as prevalent in the existing frequency bands, and not for a shorter validity period.

1. Telecom is capital intensive sector with huge payback periods. Shorter validity periods may not provide sufficient time for TSPs to recoup their investments. 20-year validity period is a must for ensuring investment stability in the sector.
2. Further, the 20-year validity period has been working well for the past 30 years. 26 GHz band is also a mmWave band like these frequency ranges; and even that has been auctioned for 20 years. Thus, there is no justification for changing the validity period for these specific bands.
3. Furthermore, longer validity periods have enabled technological development, with the same band being used for different technologies – 2100 MHz band was earlier deployed for 3G, but is now also used for 4G and can even be used for 5G; 900/1800 MHz bands were earlier used only for GSM, but are now used for LTE/5G. Shorter validity periods would discourage such innovation and evolution, due to lack of certainty on recovery of investments.
4. Shorter validity periods may also attract non-serious players in the industry – which would harm the interests of both the consumers and the exchequer.
5. In any case, an operator would have the option to trade the spectrum after 2 years or surrender it after 10 years. Therefore, there does not seem to be any justification for a shorter validity period.

In view of the foregoing, the spectrum in the frequency ranges (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, consistent with the present approach (including in the 26 GHz band).

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.

Response –

The spectrum in (a) 37-37.5 GHz, (b) 37.5-40 GHz, and (c) 42.5-43.5 GHz frequency ranges should be consistent with the existing licensing regime and only be assigned for the licensed service areas (LSAs) for Access Service (i.e., Telecom Circles/Metros), and not for smaller service areas for the following reasons:

1. Assignment for smaller service areas may leave the rural and semi-urban areas uncovered, as TSPs would only be interested in getting the spectrum for densely populated urban areas. This would add up to the digital divide that the Government wishes to eradicate.
2. The LSA-wise assignment has been working well for the past 30 years. 26 GHz band is also a mmWave band like these frequency ranges; and even that has been auctioned on the basis of LSAs.

Thus, there is no justification for changing the service areas for these specific bands. Further, Access services licenses/authorizations are granted LSA-wise; and the approach for spectrum has to be consistent with that.

3. Moreover, as spectrum/licenses have always been granted LSA-wise, the networks have been designed accordingly. Smaller service areas would disrupt the entire network and business planning of TSPs, and create unnecessary operational and regulatory complexities.
4. In addition, the fragmentation of spectrum may lead to inefficient utilization of this scarce resource due to presence of multiple small operators in localized areas. On the other hand, larger TSPs may not be able to deploy nation-wide or LSA-wide networks and enjoy economies of scale, due to disjointed spectrum holdings.
5. Besides, it would be highly challenging for WPC to ensure interference management and harmonization with smaller service areas.

In summary, the spectrum in the frequency ranges (a) 37-37.5 GHz, (b) 37.5-40 GHz, and (c) 42.5-43.5 GHz, should be assigned LSA-wise, consistent with the approach followed in the case of the existing frequency bands (including 26 GHz band).

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.

Response –

The block size in (a) 37-37.5 GHz, (b) 37.5-40 GHz, and (c) 42.5-43.5 GHz frequency ranges should be a minimum of 100 MHz.

The minimum quantity for bidding should be 400 MHz for new entrants (who do not hold any spectrum in any mmWave band) and 100 MHz for existing operators (who already hold spectrum in any of the mmWave spectrum bands).

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.**

Response –

No comments.

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.

Response –

There should be no separate roll-out obligations in respect of the frequency ranges (a) 37-37.5 GHz, (b) 37.5-40 GHz, and (c) 42.5-43.5 GHz, for such licensees who have already fulfilled roll-out obligations in the 26 GHz band, as the new bands would be utilized only to build additional capacity over and above the network coverage already deployed using 26 GHz band for 5G/FWA services.

For new entrants with no prior spectrum holding in any of the mmWave spectrum bands, it should be similar to the roll-out obligations for 26 GHz spectrum in NIA 2022/2024.

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.

Response –

Yes, the eligibility conditions and associated eligibility conditions for participation in the auction for the 37-37.5 GHz, 37.5-40 GHz, and 42.5-43.5 GHz bands 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.

Since the frequency ranges under consideration in the instant CP will also be used for 5G services like many existing spectrum bands, the inclusion of new bands in auctions cannot be allowed to become a trigger for changing eligibility conditions. Therefore, we suggest that DoT maintain a consistent approach in this regard.

Moreover, eligibility conditions specified in the NIA 2024 are quite flexible as they allow even non-licensees to bid for the spectrum, so long as they give an undertaking that they will procure the necessary license, i.e., UL (Access Service). Even for the 26 GHz band, which is a mmWave band spectrum like these new frequency ranges, the same eligibility conditions have been defined.

Therefore, the eligibility conditions for participation in the auction for the frequency ranges (a) 37-37.5 GHz, (b) 37.5-40 GHz, and (c) 42.5-43.5 GHz should be in line with those prescribed for the existing spectrum bands in NIA 2024.

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.

Yes. To mitigate inter-operator interference due to TDD-based configuration, the approach adopted for the 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.

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.

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, –

(a) 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?

(b) What other parameters should be prescribed for the coexistence of IMT and Satellite Gateway links?

Suggestions may kindly be made with detailed justification.

Response –

In case it is decided that sharing the (i) 37.5-40 GHz and (ii) 42.5-43.5 GHz spectrum frequency ranges between IMT and Satellite Gateway links would be appropriate, an appropriate protection/keep-off distance between IMT stations and Satellite Earth Station Gateways should be prescribed.

However, in order to enable TSPs to take an informed decision regarding the acquisition of spectrum, the present/planned locations of satellite hub stations must be made available prior to auctions. Further, post auctions, a new hub station should be allowed to be established only in isolated areas with no existing IMT base station.

Therefore:

- (i) An appropriate protection/keep-off distance should be prescribed between IMT stations and Satellite Earth Station Gateways for the purposes of co-existence in the frequency ranges (i) 37.5-40 GHz, and (ii) 42.5-43.5 GHz.**
- (ii) In order to enable informed decision making, the present/planned locations of satellite hub stations must be made available prior to auctions.**

- (iii) Post auction, a new hub station should be allowed to be established only in isolated areas with no existing IMT base station.

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.

Response –

In the past valuation exercises of the Authority, it has been observed that using spectrum efficiency factors of other bands has resulted in the wrong estimation or overestimation of the respective band's value being reached. Additionally, since the spectrum efficiency factor is a subjective parameter dependent on many unknown variables in the industry, it needs to be treated as such.

Therefore, going forward, the Authority's spectrum pricing exercise should be based on the industry's incremental/aggregate RoCE and incremental/marginal revenue generation ability in the spectrum band(s) being valued. It is our suggestion that each band be valued based on its economic value and business case, using a marginal revenue approach.

Alternatively, since these spectrum bands are being auctioned for the first time in India and there are no reference points or data related to the spectrum being auctioned, the following approach could be considered:

- The valuation of the spectrum in these bands can be estimated by considering the auction determined price of spectrum in 26 GHz. This value should be further reduced based on the comparative efficiency and propagation loss of these bands compared to the 26 GHz band.
- The valuation should also be further adjusted and rationalised depending upon the available quantum of the spectrum development status of the device and equipment ecosystem as well as the global adoption of that band.

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.

Response –

No. The international spectrum prices of other countries in the 37-37.5 GHz, 37.5-40 GHz and 42.5-43.5 GHz spectrum bands should not serve as a basis for the valuation of these bands due to the differences in the levels of maturity of the respective network and of the social and economic parameters of India

when compared with the referred international countries. However, since there is no reference point for these bands in India, this approach could be considered an additional derivative in the process of valuation before being further normalised to adjust for the Indian telecom economics, i.e., ARPU, RoCE, rollout obligations and investment.

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.

Response –

The Authority's spectrum valuation approach must emerge from the industry's incremental/aggregate RoCE and incremental/marginal revenue generation ability in the spectrum band(s) being valued. Therefore, it should be valued based on its economic value and business case, using a marginal revenue approach.

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.

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

Response –

The reserve price for all spectrum bands in the past has followed a combination of valuation models/approaches which have in turn led to the discovery of a price not sustainable in the long term. The success of some bands and unsuccessful auctions in other bands clearly indicates that there are factors beyond modelling (potential revenue, free cash flow and profitability) that impact the success of spectrum auctions.

Therefore, there is a need to re-look at the approach for the valuation of spectrum such that it is able to balance the long term public good, continuous impact on the national economy and its growth due to investment in telecom infra with the one-time revenue opportunity of spectrum sale.

Therefore, the valuation of the respective spectrum bands should be based on their economic value and business case. In such cases, a marginal/incremental revenue approach should be the preferred approach since it would be proportionate to the potential revenue generated by the additional spectrum bands acquired through auction.

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.

Response –

The reserve price **should not exceed 50% of the valuation** of the band to ensure that the prices discovered in the auction are market driven.

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.

Response –

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 should be as follows:

- i. Upfront payment:** There should be no requirement of upfront payment.
- ii. Moratorium period:** At least a 6-year moratorium period should be allowed, in order for TSPs to be able to start realising revenues from the spectrum before they have to make the payments for the same.
- iii. Total number of installments to recover deferred payments:** A total of 14 annual instalments, after the 6 year moratorium period, should be fixed – with no upfront payment requirement. This will enable TSPs to invest in network rollout.
- iv. Rate of discount with respect to deferred payment and prepayment:** Huge interest on deferred spectrum payments defeats the purpose of allowing a moratorium. Therefore, no interest should be levied on deferred payments.

In case interest has to be levied, it should be at the repo rate, and not the SBI PLR/MCLR, as repo rate is adequate to protect the time value of money. SBI PLR/MCLR imposes unwarranted financial burden on TSPs.

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

Response –

In addition to our submissions in Q1-19 above, there are certain other issues related to spectrum assignment, that need to be highlighted:

i. Calculation of Interest on Spectrum Installments:

As per the 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.

Therefore, we recommend that the interest on spectrum installments should only be applicable from the date of issue of the frequency assignment letter and not earlier.
