16th May 2024

Shri Akhilesh Kumar Trivedi,
Advisor (NSL)
Telecom Regulatory Authority of India
Mahanagar Doorsanchar Bhawan
Jawahar Lal Nehru Marg
New Delhi – 110 002

Subject: Tata Communications Limited comments to TRAI Consultation Paper on 'Auction of Frequency Spectrum in 37-37.5 GHz, 37.5- 40 GHz, and 42.5- 43.5 GHz band Identified for IMT'.

Dear Sir

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

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

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

Thanking You,
Yours Sincerely,

Alka Selot Asthana
Vice President and Head Regulatory Affairs
Tata Communications Limited

Enclosed: As mentioned above

Annexure

Tata Communications Limited's 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 band Identified for IMT'

At the outset, we thank TRAI for providing us an opportunity to share our comments/inputs on this important consultation paper on 'Auction of Frequency Spectrum in 37-37.5 GHz, 37.5-40 GHz, and 42.5- 43.5 GHz band Identified for IMT'.

The consultation paper has been issued based on DoT's reference dated 2.8.2023 to which TRAI had reverted per their response dated 01.09.2023. We note that so far only three countries have undergone a consultation process – US, UK and Canada regarding the allocation of these spectrum bands. In that context, it is commendable that Regulator and Government have launched the policy initiatives with regard to allocation of these spectrum bands and speaks volumes about the importance of the telecommunications sector especially the multiplier effect it provides to the overall economic prospects of the country and in the development and growth of telecommunication services in the country.

Tata Communications being an Enterprise service provider is required to deliver services to its Enterprise Customers' premises / locations as per their business requirements which at times, needs radio based front haul network for the last mile connectivity. . In order to serve Enterprise customers efficiently, there is need to have spectrum to meet their business requirements and to support them in their digital transformation journey. Tata Communications being an ISP licensee was administratively allocated spectrum in 3.3-3.6 GHz band which was used to provide services to Enterprise Customers since 2006 and was surrendered in January 2020 as the spectrum allocated in 3.3.-3.6 GHz was required to be vacated being identified for IMT/5G services.

In view of the same, it is important to emphasise that Tata Communications as a TSP concentrates on specifically the Enterprise segment and hence requires allocation of backhaul mmWave spectrum to support Enterprise use cases, in order to make Indian enterprises competitive on global scale through adoption of Industry 4.0 solutions. The intent is also to support the startup eco system thus, leading to enhanced employment opportunities as well as promotion of Make In India focus of Government of India.

The non-availability of spectrum for establishing last mile connectivity puts us in competitive disadvantage as compared to the Access Service Providers vying for the same Enterprise market segment. This creates non-level playing field between Access Service Providers and non-Access Service Providers in the Enterprise market resulting into Enterprise Customer churn due to deterioration in quality of service as per industry norms/ agreed SLAs on account of not having adequate spectrum for establishing last mile access / connectivity.

In the absence of availability of spectrum, non-Access Service Providers like Tata Communications have been finding it very difficult to retain existing Enterprise Customers due to increasing cost of maintaining the network on suboptimal unlicensed band using Unlicensed Band Radio (UBR). The use of UBR for last mile connectivity as against to earlier used spectrum in 3.3 GHz has many operational and technical challenges.

These spectrum bands (37-37.5 GHz, 37.5- 40 GHz, and 42.5- 43.5 GHz) can be primarily deployed as mmWave spectrum for meeting back haul requirement for all licensed service providers due to the fact that these bands have- very high capacity and ultra-low latency

requirement. The deployment of mm Wave spectrum for IMT is not likely to be ubiquitous as it is likely to be used for creation of hot spots primarily.

In order to meet the ISPs enterprise customer requirements, there is a need to create a new network to meet last mile access / connectivity requirement. These mmWave spectrum bands have the capability to deliver higher bandwidths and can be deployed for last mile connectivity and backhaul applications, high-capacity P2P links and Private Networks. Therefore, it is recommended that these bands should be made available to all licensed service providers and accordingly Tata Communications recommends that at least a paired 250 MHz spectrum (FDD 250MHz x2) in the 37.5-40 GHz and 42.5-43.5 GHz bands should be kept reserved specifically for Microwave Point-to-Point (PTP) applications as a backhaul spectrum as it has the ability to deliver higher bandwidths to all the Licensed Operators. This reserved spectrum allocation should be done administratively on Point-to-point basis and all licensed operators should be eligible to obtain including TSPs with other than Access Service License/ Authorization along with other service entities. It is also recommended that the Spectrum for High Altitude Platform Stations (HAPS) deployments should be allocated administratively in the 38 to 39.5 GHz band to TSPs with other than Access Service License/ Authorization, along with other entities. Such use of the fixed-service allocation by HAPS shall be in accordance with the provisions of Resolution 168 (Rev.WRC-23).

Further, there are provisions in the Telecommunication Act, 2023 (notified on 24-12-2023) which provides for administrative allocation of spectrum in case of 19 exceptions. Notably, Radio backhaul for telecommunication services is one of the exception listed in the 'The First Schedule' to The Telecommunications Act, 2023.

With the above provisions, the Government can allocate the spectrum administratively in case of techno- economic cases. The use case of mmWave fall under the techno economic considerations as the range of this spectrum is very limited and there cannot be a ubiquitous deployment for this range of frequencies. Further, as mentioned in the consultation paper, OFCOM, UK is also proposing to make the whole spectrum band (40-43.5 GHz band) available for local first come, first served licenses using shared access licensing framework. Thus, there are global practices as well for allocation of this band on administrative basis.

With this background, Tata Communications' comments on the consultation paper are as follows:

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.

Tata Communications Response to Q1 & Q2:

DoT in its reference letter dated 02.0.02023 has mentioned that following new frequency bands can be made available for IMT & Satellite communication services:

Sr no	Application/ Services	Frequency bands	Quantum of spectrum (in MHz) in each LSA
1	IMT	37- 37.5GHz	500

2.	IMT (to share with Satellite Gateway Earth Stations with suitable protection)	37.5-40 GHz, 42.5- 43.5 GHz	3500
	Total		4000

As per 3GPP there are two band plans i.e. n259 (39.5 GHz to 43.5 GHz) and n260 (37 to 40 GHz) in the frequency ranges referred by DoT. Further, the eco system is very strong for n260 Band as there are 280 devices of over 11 brands are supporting n260 band (*Reference: GSM report, February 2024, referred in TRAI consultation*). However, the device eco system is not available for n259 spectrum band (39.5 GHz to 43.5 GHz band). While US and Canada have allocated the spectrum in 37.6 GHz to 40 GHz) so far, Ofcom UK has decided to make 40.5-43.5 GHz band available for auction, as they feel that availability of mobile technology equipment and devices in the adjacent 39 GHz band which has similar technical properties to the 42.5 -43.5 GHz. Thus, Ofcom has gone ahead with its decision to allot spectrum in 40-43.5 GHz band, even if, the eco system is not there at present.

In view of the above analysis, we believe that 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 may be offered for allocation and accordingly at least a paired 250 MHz spectrum (FDD 250MHz x2) in the 37.5-40 GHz and 42.5-43.5 GHz bands should be kept reserved specifically for Microwave Point-to-Point (PTP) applications as a backhaul spectrum as it has the ability to deliver higher bandwidths to all the Licensed Operators. This reserved spectrum allocation should be done administratively on Point-to-point basis and all licensed operators should be eligible to obtain including TSPs with other than Access Service License/ Authorization along with other service entities.

It is also recommended that the Spectrum for High Altitude Platform Stations (HAPS) deployments should be allocated administratively in the 38 to 39.5 GHz band to TSPs with other than Access Service License/ Authorization, along with other entities. Such use of the fixed-service allocation by HAPS shall be in accordance with the provisions of Resolution 168 (Rev.WRC-23).

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.

Tata Communications Response:

We are of the view that at least a paired 250 MHz spectrum (FDD 250MHz x2) in the 37.5-40 GHz and 42.5-43.5 GHz bands should be kept reserved specifically for Microwave Point-to-Point (PTP) applications as a backhaul spectrum as these bands have ability to deliver higher bandwidths to all the Licensed Operators.

It is also pertinent to mention that the 3GPP band plan n259 starts from 39.5 GHz and goes up to 43.5 GHz. As per 3GPP there is an overlap at 39.5 to 40 GHz band as it is appearing in both n259 and n260 3GPP bans. Against 3GPP band n259, DoT's corresponding proposal for allotment of spectrum is only from 42.5 GHz to 43.5 GHz band. Since, presently DoT is not allocating any spectrum adjacent to 40 GHz band, there is no overlap of frequencies in the scheme of spectrum allocation proposed by DoT.

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.

Tata Communications Response:

These new frequency bands being identified for IMT services are unlikely to have eco-system fully developed from beginning of the allocation of the frequency in these bands and therefore this issue has emerged that spectrum allocation may be done for a period not less than 10-15 years or for 20 years.

In this context, it is recommended that the Government should enable legal and policy framework allowing ISPs and Long-Distance service providers also to acquire spectrum in these bands through a spectrum auction at a very low reserve price with no rollout obligation for a period of minimum 10 years as these bands would not be having device and equipment ecosystem readily available in next 5-10 years. Therefore, we believe that those entities who would be opting for allocation of spectrum in these bands should be encouraged as they are taking risk by investing in these bands.

Even though the full ecosystem is not developed, and such bands are yet to find adequate use cases, the Government has decided to allocate these bands. Thus, in the manner as suggested above, the Government would also be realising its revenue from these bands much earlier than the maturity of technology in these bands. The technologically advanced countries like South Korea, USA and UK have also allocated the spectrum in these bands for shorter duration of 5, 10 and 15 years and same may be adopted in India as well for these frequency bands.

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.

Tata Communications Response:

In order to determine the appropriate licensing area, the potential uses of the spectrum, characteristics of the spectrum including the propagation and interference coordination challenges need to be evaluated. The limited range of mm Wave makes mm Wave suitable for licensing for a service area much smaller to LSA based allocation prevalent as of now.

Tata Communications recommends that at least a paired 250 MHz spectrum (FDD 250MHz x2) in the 37.5-40 GHz and 42.5-43.5 GHz bands should be kept reserved specifically for Microwave Point-to-Point (PTP) applications as a backhaul spectrum as these bands have ability to deliver higher bandwidths to all the Licensed Operators. This reserved spectrum allocation should be done administratively on Point-to-point basis and all licensed operators should be eligible to obtain including TSPs with other than Access Service License/ Authorization along with other service entities. It is also recommended that the Spectrum for High Altitude Platform Stations (HAPS) deployments should be allocated administratively in the 38 to 39.5 GHz band to TSPs with other than Access Service License/ Authorization, along with other entities. Such use of the fixed-service allocation by HAPS shall be in accordance with the provisions of Resolution 168 (Rev.WRC-23).

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.

Tata Communications Response:

We are of the view that the block size of 50 MHz would not only provide flexibility to Telecom service providers to opt for quantum of spectrum required by them and it will also be in line with the earlier followed practice in the allocation of mm Wave band (24.25- 27.5 GHz band) having the block size of 50 MHz.

Further, the frequency band of 37- 37.5 GHz band, 37.5- 40 GHz band and 42.5 – 43.5 GHz band is comparable to mmWave band (24.25- 27.5 GHz band), and hence the block size can be continued as 50 MHz.

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.

Tata Communications Response:

We support Option (a), i.e. Combined spectrum cap for 26 GHz band and the frequency ranges under consideration. This is being suggested since the propagation characteristics of mm Wave spectrum band is same for both of these frequency bands. Further, in case we go with the logic that band wise cap needs to be levied, then, in that case, it would require revision in application of spectrum cap in Sub GHz and 1800/ 2100/ 2300/ 2500 MHz band as well.

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.

Tata Communications Response:

We are of the view that the device and equipment Eco-system in these spectrum bands is yet to be developed to an extent to recommend rollout obligations.

Further we believe that rollout obligations should not be levied on account of following reasons:

1. Deployment of mm Wave spectrum for IMT is not likely to be ubiquitous as it is likely to be used for creation of hot spots and provision of fixed wireless services specifically for Microwave Point-to-Point (PTP) applications and also High-Altitude Platform Stations (HAPS) deployments.

2. The mm Wave spectrum band (26 GHz band) are similar to spectrum bands under discussion. The mm Wave spectrum was put to auction in July- August 2022 with rollout obligations. However, on account of lack of ecosystem, the spectrum remained unutilised

by some of the TSPs, as a result, the Government is considering the waiving off the penalty amount.[1] The matter is being consulted with TEC as well.

3. When the ecosystem against the more popular spectrum band of 26 GHz is itself not developed so far, there would be no rational in prescribing rollout obligations for the spectrum bands of higher frequency ranges.

   In view of this, it would be in fitness of things that no rollout obligations should be assigned against these spectrum bands. It is suggested that the Government may wait for TEC report before prescribing any rollout in the spectrum bands under discussion, in this consultation paper.

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.

Tata Communications Response:

The eligibility conditions for allocation / participation in the auction should emerge out of the potential users / use cases of the spectrum, characteristics of the spectrum including the propagation etc. The potential use case characteristics of mmWave spectrum i.e. spectrum bands being discussed in the consultation paper, is not such that it promotes ubiquitous proliferation of the telecom services. As mentioned in the consultation paper itself, the spectrum is suitable for a point-to-point link or fixed wireless access.

In view of this, there is a need to revisit the criteria of eligibility for allocation of the spectrum bands under discussion. **We strongly recommend that the allocation of spectrum in these frequency bands can serve the purpose of provision of high-capacity point to point links for an Enterprise, and hence it is suggested that the eligibility criteria for the allocation of these bands should include TSPs other than Access Service providers including ISPs.** The revision in the eligibility criteria will certainly promote the usage /adoption of these spectrum and would give a boost to development of Enterprise based use cases.

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.

Tata Communications Response:

We believe that the approach suggested by TRAI in its recommendations on "*Auction of spectrum in frequency bands identified for IMT/ 5G*" should be adopted for the spectrum bands considered for deliberation in this consultation paper as well. Therefore, the following steps should be taken:

(i) Implementation of dynamic TDD, wherein each cell in the network can adapt its uplink/ downlink ratio depending on traffic requirement.

[1] https://www.msn.com/en-in/money/topstories/dot-mulls-waiving-5g-minimum-rollout-fine/ar-BB1j3ldN[11]

(ii) Synchronize outdoor networks or adjacent frequencies of different TSPs.

(iii) In case a TSP acquires more than one block, the entire spectrum should be assigned in a contiguous manner.

(iv) Cross border interference issues can be avoided if a TSP is assigned same frequency spot across different LSAs.

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.

Tata Communications Response:

The deployment of spectrum bands (37–37.5 GHz, 37.5–40 GHz and 42.5–43.5 GHz) is not likely to be ubiquitous, rather it is more likely to be kind of hot spots or urban micro cells. Therefore, IMT stations and Satellite Earth station Gateway can co-exist in these frequency ranges. Due to significant propagation loss, achieving seamless coverage is a challenge, but it is a blessing as well as it provides an opportunity for sharing of spectrum with satellite earth stations.

It is suggested that recommendations made by the regulator on this matter on "*Auction of spectrum in frequency bands identified for IMT/ 5G*" dated 11.04.2022 can very well be applied for the spectrum bands under consultation in this consultation paper.

The key suggestions are given below:

1. The Satellite Earth gateway station should be permitted to be established in the frequency bands under discussion, at uninhabited or remote locations.

2. DoT should create a software defined automated process on a portal having database of coordinates of the proposed earth station in the spectrum bands under consultation. The geofencing coordinates of the proposed earth station in these spectrum bands under discussion, can provide the feasibility results through the portal for establishing earth station.

3. DoT may prescribe the exclusion zone requirement for coexistence of IMT and satellite earth 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.

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.

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.

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

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.

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 instalments to recover deferred payments
iv. Rate of discount in respect of deferred payment and prepayment

Please support your answer with detailed justification.

Tata Communications Response:

The auction of natural resource such as spectrum cannot be considered as the best method for allocation. There are several other factors which ought to be considered such as the development of the country, benefit to citizen, multiplier effect on the economy, impact on the well-being of people and creation of jobs, realisation of Goals set up by the country such as Make in India and making the country Atma Nirbhar. The Government has realised this aspect and therefore it has already exempted certain categories of use cases from the auction requirement under the Telecommunication Act, 2023 which has been notified on 24/12/2023. The schedule 1 of the Act contains 19 such exceptions where in the Government can allot the spectrum on administrative basis in order to meet certain objectives and in the interests of General Public.

The nature of the spectrum bands in discussion cannot provide the contiguous/ ubiquitous coverage and it is unlike the access spectrum bands being used to deploy 2G/ 3G/ 4G or 5G services. The allocation of spectrum on administrative basis under these bands would give a

huge opportunity for research and development of various use cases, Industry 4.0, Private 5G use cases etc. which will give much needed impetus to the domestic manufacturing industry as well.

In many economies, the cost of infrastructure required as an alternative to the scarce natural resource is manifold higher as against the perceived value of natural resource. For example, in the developing economies with low per capita income the cost of setting up telecom infrastructure would be very high as against the cost of spectrum which is to be allocated to set up the telecom network; however, it would be possible only in case when spectrum is assigned on administrative basis.

In view of this, we strongly recommend that the spectrum allocation under the spectrum bands in discussion should be done on administrative basis.

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

Tata Communications' response:

No comments