

RJIL/TRAI/2024-25/056

24<sup>th</sup> May 2024

To,

**Shri Akhilesh Kumar Trivedi,**  
**Advisor (Networks, Spectrum and Licensing)**  
**Telecom Regulatory Authority of India,**  
Mahanagar Doorsanchar Bhawan,  
Jawaharlal Nehru Marg, New Delhi - 110002

**Subject: RJIL's comments on 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".**

Dear Sir,

Please find enclosed the comments of Reliance Jio Infocomm Limited (RJIL) on the 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 bands Identified for IMT"**.

Thanking you,

Yours Sincerely,  
For **Reliance Jio Infocomm Limited**

**Kapoor Singh Guliani**  
Authorized Signatory

**Enclosure:** As above

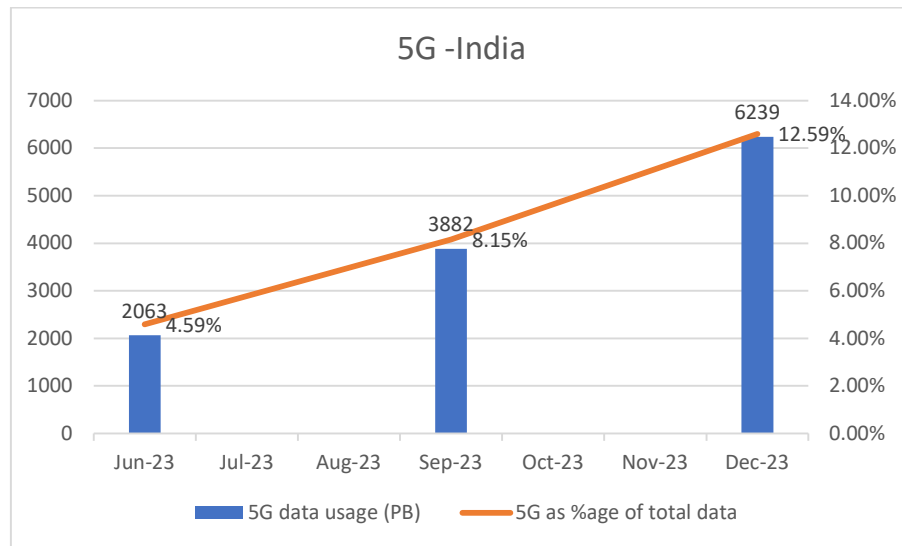
**Reliance Jio Infocomm Limited’s comments on TRAI’s Consultation Paper on  
“Auction of Frequency Spectrum in 37-37.5 GHz, 37.5-40 GHz, and 42.5-43.5 GHz bands  
Identified for IMT” dated 4<sup>th</sup> April 2024**

**Preface:**

1. Reliance Jio Infocomm Limited (RJIL) thanks the Authority for giving an opportunity to offer comments on the important 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.**

**A. Spectrum Availability and Auction Plan**

2. At the outset, we submit that this is an opportune time to make available more mmWave spectrum, as the adoption of 5G services is increasing in the country with 5G data consumption almost doubling every quarter and share of 5G data in total wireless data consumption being on a high curve.



Source: TRAI’s The Indian Telecom Services Performance Indicators reports

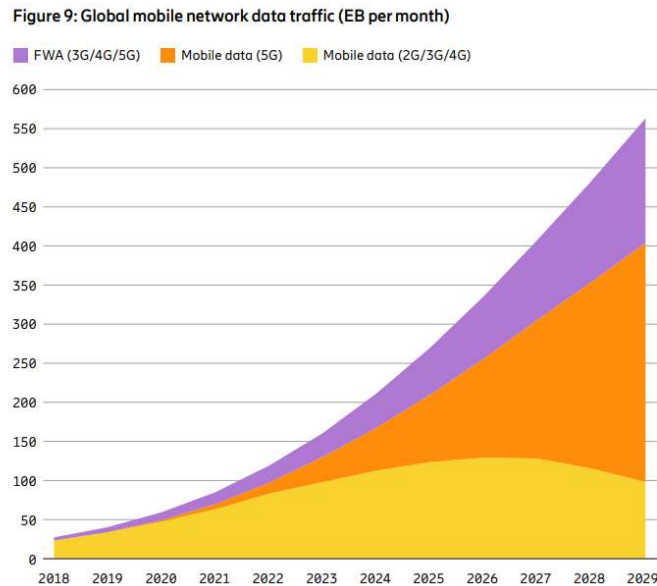
3. Globally, as well, major wireless data consumption is moving towards 5G and FWA (4G/5G). As per the Ericsson mobility report November 2023<sup>1</sup>, the share of 5G in total wireless data has already breached 25% mark and is set to dominate and account for over 75% of the total wireless data.

*Populous markets that launch 5G early are likely to lead in terms of traffic growth over the forecast period. 5G’s share of mobile data traffic is estimated to be 25 percent at the end*

<sup>1</sup> <https://www.ericsson.com/4ae12c/assets/local/reports-papers/mobility-report/documents/2023/ericsson-mobility-report-november-2023.pdf>

of 2023, an increase from 15 percent at the end of 2022. This share is forecast to grow to 76 percent in 2029.

- The report goes on to project massive data growth in 5 years' time with complete domination by 5G data.



- Clearly, for India to play a critical role in growth of 5G services, it is imperative that all IMT identified and IMT targeted spectrum i.e. complete **C-Band (3.3 GHz to 4.2 GHz) (n77), 4.4 GHz to 5.0 GHz (n79), 6 GHz (5.925 GHz to 7.125 GHz), mmWave (26 GHz (24.25 – 27.5 GHz)(n258), 28 GHz (27.5 – 29.5 GHz)(n257), Complete 40 GHz band including 37.0 – 40 GHz (n260), 39.5 – 43.5 GHz (n259), 47.2 – 48.2 GHz (n262) bands and Sub-GHz (600MHz & 700MHz) bands alongwith spectrum in V-Band and E-Band is put to auction at the earliest for IMT services in India.**

- In the context of the current proposal for auction, we submit that it is imperative that complete 40 GHz band is auctioned and there is no reason to keep the spectrum in 40-42.5 GHz out of the scope of this auction. It is submitted that this is an IMT targeted spectrum and GSMA has already recommended for Identifying the whole range from 37 to 43.5 GHz for IMT. Further, considering the global analysis on spectrum requirements, the complete range should remain in the mix for auction. It is understood that at least 5 GHz of spectrum in high band will be required for optimum 5G services in mmWave band. GSMA also agreed to this in its analysis on future demand titled *Successful 5G auction will*

*bring India a bright digital future*<sup>2</sup>. A few excerpts are reproduced herein below for ready reference.

*“Low, mid- and high bands’ distinct characteristics drive different spectrum needs:*

- *While low band is constrained by physics, and demand always outstrips supply, adding the 600 MHz band to the portfolio of spectrum holdings will raise download speeds by 30-50% in rural areas.*
- *2 GHz of mid-band per market is required to provide city-wide capacity and meet the ITU’s requirements for IMT-2020. Without access to the 6 GHz band, this goal will be difficult to reach.*
- *5 GHz of high-band spectrum per market will deliver pioneering ultra-fast speeds and the lowest latencies in high-capacity mmWave hotspots.”*

## **B. Interference issues and Band Plan**

7. We understand the concerns around multi-technology use of this spectrum and the consequent possibility of interference. Fortunately, this has been an issue for consideration and the WRC 19 has come out with reasoned research and possible mitigation measures to address this issue. As the satellite gateways are generally a few in numbers and would be located at rural / away from the urban markets, we do not see any issue in sharing of spectrum between IMT and satellite gateways as the same can be addressed by keeping suitable exclusion zones.
8. TDD-based duplexing configuration has been found optimum for most high frequency bands and spectrum in 40 GHz band is no different. We further understand that minimum 400 MHz of this spectrum will be required to provide optimum 5G services and therefore we recommend a block size of 50 MHz or 100 MHz.

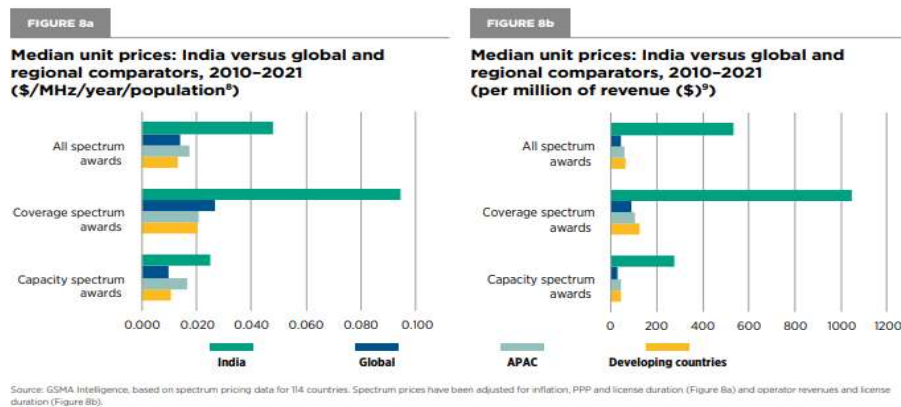
## **C. Spectrum Valuation and Reserve Price**

9. We submit that the valuation of spectrum is the most critical aspect of any auction related consultation exercise, as this alone indicates to the market on the expected interest in the auction. We reiterate our previous submissions on similar consultation exercises that the Authority should delink the spectrum valuation from maximization of one- time spectrum auction proceeds and instead link it with national objectives, proliferation goals, societal and economic impact on all spheres of life and to regenerate demand of spectrum and competition in sector and to ensure that no spectrum remains unsold.

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<sup>2</sup> <https://www.gsma.com/connectivity-for-good/spectrum/successful-5g-auction-will-bring-india-a-bright-digital-future/>

10. **Objectives of the auction:** The sheer nature of the spectrum to be auctioned is sufficient to settle the objectives of this auction. This spectrum will be only a capacity band and would not be available all across the LSA and would provide revenue opportunities in select areas only. This should be under consideration along with the objective of auctioning the spectrum in a most transparent, non-discriminatory manner at market price by allowing operators to use it optimally and efficiently through terrestrial and/or satellite media as per their network and business plans to deliver services to the people at affordable rates.
11. **Past Auction Results:** The Auction determined price (ADP) of same and/or similar spectrum in an analogous auction has always been the most critical valuation metric for any spectrum. In current case, we have a readymade ADP of mmWave spectrum in 26 GHz band in the auction conducted in 2022 and subsequent reserve price of this spectrum in 2024 NIA.
12. **International Benchmarking:** We submit that for 5G bands, international benchmarking is a very relevant and critical factor. As mmWave is still under deployment in the country, International Benchmarking derived from actual marketability assessments of mmWave across the globe would be better than some imaginary numbers based on efficiency factor.
13. As highlighted in our submissions to the CP on Auction of Spectrum in frequency bands identified for IMT/5G dated 30<sup>th</sup> November 2021, GSMA, under its report<sup>3</sup> of September 2021 has already noted that spectrum awards in India have always exceeded the international benchmarks by multiples as shown below.



This trend has remained unabated in the 2022 auction and therefore, it would be prudent to consider this factor in valuation of 40 GHz band.

<sup>3</sup> <https://www.gsma.com/spectrum/wp-content/uploads/2021/09/India-5G-Spectrum.pdf>

14. **Network Costs:** Another important criterion is the projected cost of laying a network, we submit that as we go up in the frequency chart, the coverage area reduces considerably thereby implying a larger spend on network infrastructure and Opex to maintain this infrastructure.
15. **Revenue Potential of spectrum:** There is always an inverse relationship between the coverage objectives and ARPUs. Thus, while, we go for the final millions to be connected to broadband, the pricing needs to be just right for them to come onboard without entry barriers. This implies that there is minimal pricing elasticity available with TSPs on addition of new spectrum and the cost of the spectrum needs to be somewhat absorbed in existing pricing. Thus, the addition of 5G bandwidths will not allow massive increase in ARPUs/tariffs due to the low paying capacity and disposable income. Therefore, it is reasonable and fair to conclude that the revenue potential of this spectrum is not enormous and therefore pricing should be accordingly appropriate.
16. **Impact of proliferation on national economy:** The NDCP-2018 notes that *“It has been broadly estimated that a 10% increase in broadband penetration in a country could potentially lead to an over 1% increase in GDP. However, studies in India estimate that the impact could be significantly higher for the country, given the increased productivity and efficiency gains that are likely to accrue to the economy”*. Thus, the policy makers need to keep the overall economic benefits of broadband penetration in mind, while carrying out the pricing exercise for spectrum. We request the Authority to rationalize the spectrum valuation with a focus to put maximum spectrum in use.
17. **Cost benefit analysis of one-time revenue against the long-term gains through license fee:** Another important consideration is to cost benefit analysis where along with the long-term economic gains, the long-term gains from license fee due to deployment of spectrum outweighs the one-time revenue. As per another GSMA report<sup>4</sup> referred earlier in 2021 CP, many countries are carefully considering wider economic goals rather than short-term monetary gains.
18. **Reserve Price:** We submit that the current policy of keeping the reserve price at 70% of the valuation is not optimum as too high becomes an entry barrier and hinders competition. Instead, we recommend that reducing the reserve price to 50% of the spectrum valuation would be optimum. This approach is likely to facilitate true market price discovery and benefit the industry in the long run by increasing spectrum uptake, minimizing unsold spectrum waste, maximizing overall returns rather than focusing on

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<sup>4</sup> <https://www.gsma.com/spectrum/wp-content/uploads/2021/03/Mobile-spectrum-trends-and-insights-Q4-2020.pdf>

unit price, and contributing to the achievement of proliferation goals while simultaneously boosting overall license fee proceeds.

## 19. Conclusions

1. Entire spectrum in 40 GHz band (37 GHz to 43.5 GHz) should be put to auction.
2. Spectrum in 40 GHz – 42.5 GHz is IMT identified and should be auctioned for flexible use between terrestrial and satellite-based network.
3. There is no imminent issue in co-existence in IMT and Satellite Gateway links and globally researched mitigation measures can be considered to obviate any such risk.
4. The TDD-based duplexing configuration is optimum for this band.
5. The ADP and indexed Reserve Price of 26 GHz band will be key relevant factors in valuation of this spectrum band.
6. International benchmarking should be used to rationalize the valuation of spectrum in 40 GHz band.
7. The reserve price should be kept at 50% of the valuation.

### Issue wise response:

**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.**

### RJIL Response:

1. We submit that **all spectrum that can be put to use in public or private communication networks should be auctioned and spectrum in the frequency ranges (a) 37-37.5 GHz, (b) 37.5-40 GHz, and (c) 42.5-43.5 GHz, is no exception.** Therefore, this band should be auctioned along with other IMT bands in the forthcoming auction of spectrum.
2. Further, we do not agree with the exclusion of the spectrum in 40-42.5 GHz band from the auction plan. **We do not understand the rationale for excluding the 40-42.5 GHz band from the scope of IMT services in DoT's reference to TRAI, when there is no such statutory recommendation from TRAI under terms of clause 11(1)(a) of TRAI Act, 1997 (as amended) for any exclusion of this band from IMT services.**
3. We do not support the exclusion of 40-42.5 GHz band from IMT services, and we propose TRAI to actually get necessary clarification from DoT for the basis of such exclusion despite a well-defined 3GPP band plan and IMT identification by ITU for global harmonization is in place. Hence, we submit that irrespective of DoT's reference, TRAI should examine this

band holistically and the recommendations for auction should include for the entire 37-43.5 GHz and not just be limited to partial bands.

4. GSMA paper<sup>5</sup> on Enabling IMT at WRC-19, provides options for identifying the whole 40 GHz band (37.5 GHz to 43.5 GHz) for IMT. Evidently, the spectrum 40-42.5 GHz band is part of an IMT identified spectrum band and RJIL has a firm belief that all IMT identified and targeted spectrum should be put to auction. GSMA further noted the following for this spectrum.

- *Identifying the whole range (37-43.5 GHz) sets the stage for a globally harmonised tuning range allowing countries to pick and choose those parts they wish to make use of.*
- *Studies show existing unwanted emission limits in 3GPP are sufficient to protect EESS (passive), and no technical conditions to protect other services are required.*

5. The World Radiocommunication Conference 2023 (WRC-23) under Final Acts<sup>6</sup> Res 243 “Terrestrial component of International Mobile Telecommunications in the frequency bands 37-43.5 GHz and 47.2-48.2 GHz” resolves the following.

*that administrations wishing to implement IMT consider use of the frequency band 37-43.5 GHz, or portions thereof, and the frequency band 47.2-48.2 GHz, identified for IMT in No. 5.550B and No. 5.553B, and the benefits of harmonized utilization of the spectrum for the terrestrial component of IMT taking into account the latest relevant ITU-R Recommendations;*

6. Pertinently, Ofcom has also decided to auction spectrum in this band vide their **Final decision<sup>7</sup> on ‘Enabling mmWave spectrum for new uses’ dated 16<sup>th</sup> April 2024.**

*We are making a large amount of spectrum in the 26 GHz and 40 GHz bands (together, “mmWave spectrum”) available for new services, including 5G.1 In the major towns and cities in which we expect the highest volume of mmWave deployment (“high density areas”), we are making 2.4 GHz of spectrum in the 26 GHz band (25.1-27.5 GHz), and 3 GHz of spectrum in **the 40 GHz band (40.5-43.5 GHz)**, available by auction.*

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<sup>5</sup> <https://www.gsma.com/connectivity-for-good/spectrum/wp-content/uploads/2019/10/Enabling-IMT-at-WRC-19.pdf#:~:text=40%20GHz%20the%20whole%20range%20from%2037%20to%2043.5%20GHz,ofers%20administrations%20flexibility%20and%20maximises%20economies%20of%20scale.>

<sup>6</sup> [https://www.itu.int/dms\\_pub/itu-r/opb/act/R-ACT-WRC.16-2024-PDF-E.pdf](https://www.itu.int/dms_pub/itu-r/opb/act/R-ACT-WRC.16-2024-PDF-E.pdf)

<sup>7</sup> [https://www.ofcom.org.uk/\\_data/assets/pdf\\_file/0030/282783/statement-enabling-mmwave-spectrum-new-uses.pdf](https://www.ofcom.org.uk/_data/assets/pdf_file/0030/282783/statement-enabling-mmwave-spectrum-new-uses.pdf)



7. We understand that Authority's view on this spectrum availability for auction is based on DoT's response, however, as a progressive Regulator, it is imperative that most optimum option of spectrum deployment should not be ignored merely because of the possibility of using the spectrum in 40.0-42.5 GHz satellite Communications.
8. We submit that the focus should be on utilizing this spectrum in most efficient manner both from the perspective of spectrum utilization as well as monetizing the natural resource. Therefore, the spectrum being put to auction **should promote flexible use**.
9. We further submit that slow growth of device ecosystem cannot be a criterion for delaying the auction of a new spectrum band as once a major economy like India decides to auction this spectrum, the ecosystem development is bound to pick up the pace, thus auctioning this spectrum would enable regulatory certainty for stakeholders and would be akin to sending a positive signal for ecosystem development and investment.

**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.**

**RJIL Response:** In view of our response to Q1, this is not applicable.

**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.**

**RJIL Response:**

1. We agree with the proposal to have a TDD band plan for this spectrum as the same is consistent with international deployment and would be helpful in aggressive device ecosystem development. **However, the auction should not be restricted to only a part of 40 GHz band and entire band should be auctioned, as mentioned in previous response.**
2. We submit that bands n259 (39.5-43.5 GHz) and n260 (37-40 GHz) are already IMT identified bands on a global level with evolving device ecosystem. As noted by the Authority, as per GSA report of February 2024, networks are investing in these bands and device ecosystem is evolving, it would be optimal to auction the entire band with TDD band duplexing-based plan. We submit that the entire band **should be included in the current auction for a flexible use i.e. the buyer should be allowed to use it for terrestrial communication or satellite-based communication or both.**

3. The TTD duplexing will aid faster channel adoption by respective transceivers using channel reciprocity property. Further, it is observed that the bandwidth support in both n259 and n260 is identical. They support channel bandwidths up to 400 MHz, which is important for achieving high 5G data rates.
4. However, it would also be not out of place to mention that all the RF characteristics of n259 & n260 are not identical. Hence, following two options could be considered for adoption based on the long term IMT plans in 37-43.5 GHz spectrum range.
  - a. Option 1: In case we wish to leverage the existing global device eco-system it will be suitable to ensure that each independent block of spectrum allotted for auction should be constrained completely within either band n259 or band n260 respectively.
  - b. Option 2: Alternatively, if DoT wishes to leverage wider bandwidth of 1 GHz and opening entire 40 GHz band for enabling higher throughput, then it would be suitable to pursue a new 3GPP band with appropriate power-class for the complete band spanning from 37 - 43.5 GHz.

**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.**

**RJIL Response:**

The current licensing and IMT spectrum assignment rules are settled at 20-year assignment period and there is no reason to change the same for 40 GHz band frequencies. Further, as, and when the IMT spectrum assignment will be moved to 30-year tenure, in line with cabinet's decision, the same should be applicable on these frequencies as well.

**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.**

**RJIL Response:**

We submit that spectrum in 40 GHz band is access spectrum, and it should be assigned only as per existing licensed service areas. We further submit that going forward in order to optimize the spectrum resources, there is a need to unify the licenses and spectrum assignments at national level and we do not find any reason for assigning this spectrum for smaller service areas.

**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.**

**RJIL Response:**

As noted in the previous response for optimum deployment and band plan, bare minimum quantity is 400 MHz would be required. Therefore, it may be useful to keep the block size of 50 MHz or 100 MHz with a minimum bidding quantity of 8 or 4 blocks respectively.

**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.**

**RJIL Response:**

1. The Authority is aware that the spectrum requirements and consequently allocation in mmWave is nothing like the spectrum requirements in sub-1 GHz band and mid-bands and the requirements will be in the range of a few GHz, therefore policies like spectrum cap should also reflect this paradigm shift.
2. **The Authority should go beyond concerns like monopolization of spectrum resources, which are relevant only in the spectrum scarcity scenarios and focus on the optimum deployment and in deriving strategic dividend of spectrum allocation**

in 5G bands in mid band like C-Band and 6 GHz bands and mmWave band like 26 GHz, 28 GHz, and 40 GHz bands.

3. It is pertinent to consider here that in case the current 3 bidder scenario persists in the upcoming 5G auctions as well then keeping lower caps will lead to quasi-administrative allocation at reserve price. **Therefore, no spectrum cap should be imposed and in case it is deemed necessary, a spectrum cap of 50% for these bands is suggested to promote competition. It is worthwhile to note that the quantity of spectrum put to auction, the cost of spectrum, competitive forces propelled by the move to upgrade to 5G will automatically ensure a multi-operator scenario in these bands.**

**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.**

**RJIL Response:**

1. We submit that the current policy on roll-out obligations has evolved basis the ground realities and has been successful in delivering desired results and should be persisted with. Accordingly, we recommend no change in the current roll-out obligations for spectrum in mmWave spectrum bands. **Further, as per the current policy, the requirement of rollout obligation shall be treated as fulfilled once the required number of district headquarters or block headquarters or rural SDCAs are covered by use of any technology in any band by a licensee.**
2. However, considering the evolving device eco-system in the bands under auction, the Authority may consider giving some additional time to meet minimum roll-out obligations (MRO) to new TSPs proposing to have stand-alone networks in this band. Whereas, for existing licensees the roll-out obligations met with other bands and technologies will continue to suffice the requirements.

**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.**

**RJIL Response:**

We submit that the eligibility criteria as defined in the NIA 2024 gives sufficient flexibility to all service providers desirous of offering communication services to Indian customers and should remain unaltered even with inclusion of new bands.

**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.**

**RJIL Response:**

1. We submit that one important method to ensure interference free operations in new bands would be to ensure that one TSP gets same spectrum allotment across all licensed service areas, as was implemented in case of 3500 MHz band and 26 GHz band auction. **As submitted earlier also, permitting the rank holder to choose the frequency spot is an optimum solution. Under this arrangement in case a TSP is rank 1 holder in majority of LSAs then it should be allocated the preferred frequency spot in all LSAs. We also suggest that this process may be adopted for all new bands being put to auction.**
2. In addition to above, to mitigate interference issues of the TDD band more effectively, we submit that all regulation and approaches adopted for 3300-3670 MHz and 26 GHz bands should also be made applicable for the frequency ranges under consideration.

**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.**

**RJIL Response:**

1. At the outset, it is submitted that we do not perceive any challenges in sharing the frequency ranges in the above-mentioned band between IMT and Satellite Gateway links. This is a well-researched subject globally and there are well established mitigation measures recommended to obviate any such risk.
2. **Furthermore, sharing studies at ITU show that coexistence between IMT and satellite gateway in the above bands are possible.** As satellite gateways will be few in numbers and primarily in rural areas and therefore sharing of spectrum between IMT and satellite gateways can be easily ensured through the appropriate **exclusion zones** (around the satellite gateway and/ or IMT BS which are in the range of few hundred meters to Kms).

**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.**

**RJIL Response:**

1. It is needless to mention that the **auction discovered prices (ADP) have been the most relevant and important factor in subsequent valuation exercise done by the Authority. While the ADP is optimum and probably the most logical mode for valuation of the spectrum for the bands having been auctioned at least once, ADP of bands similar in propagation characteristics is equally relevant for the new bands.**
2. **In case of frequencies in 40 MHz band, we have a recently discovered auction price as well as more recent indexed valuation of 26 GHz band in mmWave itself and that should be a key component in final valuation of 40 GHz band.**
3. However, it may also be noted that the use-case development in already auctioned mmWave band is slow, to say the least, and monetization of this spectrum is not happening to a satisfactory level, even globally. Therefore, the valuation can be more reasonable.
4. **Further, past auction prices should not be the only measure and all other relevant factors like international benchmarking should also be part of the consideration for a new spectrum and should be appropriately accounted for in the final valuation.**

**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.

**RJIL Response:**

1. The mmWave band is quite unlike any of other spectrum bands deployed in the country, as it will be majorly a capacity band for IMT coverage anchored on other bands like 700 MHz and 3300 MHz. It will provide high speed data capacities in dense locations as the coverage by mmWave radio transceivers in this band will be limited to 50-100 meters and we will require large number of radio transceivers in a small cluster to provide even hotspot coverage.
2. Further, the mmWave Radio cost is high because of High Frequency Front End and waveguide connection between RF front and antenna. Thus, even if we consider, hotspot deployment, the cost of laying such a network will be 100s multiple of cost of networks deployed in current spectrum bands in the country.
3. **Internationally, mmWave spectrum bands have been auctioned in many markets and even discounting the lack of clarity on availability of mid-band for 5G at the time of many of these auctions, the pricing of this band comes to less than 1% of mid-band spectrum. However, in India the ADP and consequently the subsequent reserve price of 26 GHz spectrum band is over 2% of the 3300 MHz band pricing.**
4. **Therefore, we would recommend that the price of 40 GHz band should be fixed with reference to the auction determined price/current reserve price for 26 GHz band post adjustment of propagation characteristics.**

**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

**RJIL Response:**

1. We submit that while many of the spectrum valuation methodologies used by the Authority in past exercises remain relevant,
2. the valuation for 40 GHz spectrum needs to be **rationalized/reduced as compared to the ADP/current reserve price of 26 GHz band keeping in mind the relevant contingent factors like international benchmarking, the higher cost of building terrestrial networks in higher frequency bands, revenue potential etc.**

**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.**

**RJIL Response:**

1. We submit that in view of reduction in number of effective bidders in past few auctions, reduced auction activity, lack of new entrants in sector for a while, reserve price formula of 70% of valuation of spectrum is no longer relevant.
2. We submit that in view of the requirement of discovering efficient price of spectrum, the reserve price should be decided in such a manner that there is greater participation in auction. **However, the same is possible only when reserve price is not kept at artificially high levels that act as barrier and discourages TSPs from participation in the auction.**
3. It is pertinent to point out that reduction in reserve price does not necessarily lead to loss to the Exchequer. **We understand that even if there is some reduction in final winning price as compared to previous auction, the rediscovered price will be reflective of current market price of that particular spectrum band and Government will receive license fee from that particular spectrum, which may have remained unsold and unused due to unreasonable reserve price.** There will also be the wider benefit from utilization of scarce natural resource. We reiterate that optimum value of spectrum is derived from its usage rather than from the one-time auction revenues.
4. It is also worthwhile to note that **spectrum is a non-storable resource and if it is unutilized due to lack of allotment then the opportunity loss cannot be compensated.** The loss due to non- usage due to non-allotment is much bigger than



extra price, if available in an auction after a period of time. Accordingly, the reserve price should be reasonably low, and competition will ensure the fair price.

5. **A very high reserve price, which are all guesstimate after all since actual price can only be derived from perceived supply and demand and value in the eye of buyers, which leads to failure of auction is detrimental for country's economy due to waste of available resources due to non-allotment.**
6. **Consequently, we submit that the reserve price formula needs to be revisited and the reserve price should be kept at 50% of the valuation of the spectrum.** This will enable free play of competitive market forces and help discover the real market value of spectrum. No need to add that we do not agree to proposal of keeping last discovered auction price as reserve price in next auction.

**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.**

**RJIL Response:**

1. We submit that the Government and the Authority have taken many steps to rationalize the payment terms over the years, however, more steps can be taken to provide greater impetus to the emerging technologies and give sufficient time for laying the networks or additional layers in network.
2. **We submit that the upfront payment should be kept only at 10% of the bid amount and thereafter minimum 5-year moratorium without any interest cost should be provided.**
3. Further, the deferred payment for auction discovered spectrum price, should be spread over the remaining 15 years by way of annual payments. **These annual payments should be charged with the reasonable interest rates of 6.5% as specified by RBI Repo rate, in place of current prohibitive interest rates.**

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

**RJIL Response: None**