



RJIL/TRAI/2021-22/432
January 10, 2022

To,
Shri Syed Tausif Abbas
Advisor (NSL)
Telecom Regulatory Authority of India
Mahanagar Doorsanchar Bhawan
Jawaharlal Nehru Marg, New Delhi 110002

Subject: Comments on Consultation Paper on 'Auction of Spectrum in frequency bands identified for IMT/5G' dated 30th November 2021.

Dear Sir,

Please find attached comments of Reliance Jio Infocomm Ltd. on the consultation paper on 'Auction of Spectrum in frequency bands identified for IMT/5G' dated 30th November 2021.

Thanking you,

For **Reliance Jio Infocomm Ltd.**

Kapoor Singh Guliani
Authorised Signatory

Enclosure: as above.

**Reliance Jio Infocomm Limited's comments on TRAI's consultation paper on
"Auction of Spectrum in frequency bands identified for IMT/5G"
(Consultation Paper No. 8/2021 dated 30th November 2021)**

Preface

1. We thank the Authority for issuing this consultation paper to seek views of the stakeholders on various vital aspects related to auction of spectrum for IMT/5G services.
2. We submit that the Union Cabinet, while appreciating the role played by the telecom sector in meeting the challenges posed by COVID-19, has set the ball rolling by ushering in structural and procedural reforms. **These reforms are expected to protect and generate employment opportunities, promote healthy competition, protect interests of consumers, infuse liquidity, encourage investment, and reduce regulatory burden on Telecom Service Providers (TSPs).**
3. We humbly request the Authority to take the import of these reform measures forward by submitting balanced recommendations on various vital aspects of **auction of spectrum with focus on proliferation and penetration of affordable broadband connectivity which will act as bedrock for the economic growth of the country in coming decades.** We are detailing a few suggestions to this effect in following paragraphs.

A. Spectrum availability

4. We submit that one of the most important facilitation factors to empower the annual auction calendar fixed by the Cabinet would be to include all globally recognized IMT bands in the auction. This measure will ensure that the TSPs can plan for their long-term CAPEX and OPEX investments in holistic manner with a clear perspective on spectrum availability.
5. While the DoT has given spectrum auction related reference for part of spectrum in C band spectrum in 3300-3670 MHz range and part of spectrum in mm wave band in 24.25 to 28.5 GHz range, we request the Authority to consider suo-moto to include the entire gamut of frequencies being used for IMT across the globe in its recommendations for auction to facilitate engineering and rolling out of network with optimum utilization of scarce resources. Accordingly, we request the Authority to include the entire **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), 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 (52.4 GHz to 71 GHz identified by 3GPP)**

and E-Band (71 - 76 & 81 - 86 GHz) for 5G services in India while submitting its recommendations on this subject.

6. **C-Band spectrum (3300-4200 MHz)**

- a. Worldwide, Band n77 (3300–4200 MHz), have emerged as the primary spectrum bands for early 5G deployments. We **submit that 3.3 GHz - 3.6 GHz** has been identified for IMT by ITU as well as Indian NFAP. **3.7 GHz- 3.8 GHz** is already part of the **WRC-23** agenda item for consideration for IMT. Further, a large part of the **3.7 GHz-4.2 GHz band** has already been allocated for 5G by many countries. Worldwide, more than **140 operators** have invested in building **5G networks** in C-band spectrum.
- b. As the **C-band offers balance in coverage and capacity and supports a wide range of 5G use cases** (Industry 4.0, Health Care, AR/VR, Smart Cities, etc.), it has become a default anchor band for 5G. Thus, it will be only prudent to allocate the **entire C-band spectrum** (i.e., from 3.3 GHz- 4.2 GHz) for the 5G/IMT networks. The spectrum allotted for the TSPs should be a interference free **and contiguous spectrum** on a pan-India basis without any further liability of co-existence with other communication services.
- c. The C-band will play a pivotal role in the expansion of 5G networks in India. **Hence it is important that the ideal quantum of 200 MHz per operator should be made allocated in the long term. The ideal quantum for mid-band can only be possible when the entire C-band (i.e., from 3.3 GHz- 4.2 GHz) will be assigned for 5G/IMT networks without any requirement of co-existence with other users.** Therefore, we request the Authority to include entire C-band spectrum in its recommendations.

7. **mmWave spectrum n258 (24.25 GHz – 27.5 GHz) and n257 (26.5 GHz – 29.5 GHz)**

- a. We submit that in order to harness true potential of 5G and make it success, **adequate spectrum is essential in both mid band and high band to provide world-class 5G services.** It is well known fact that the **mmWave band offers the capacity essential for enhanced Mobile Broadband (eMBB) and Ultra-Reliable Low-Latency Communications (UR-LLC) services.** Needless to say, that mmWave is critical to create the required 5G capacity. Further, the use cases primarily relating to the enterprises will also need adequate spectrum in mmWave band.
- b. 5G network rollout can happen only in an integrated and unified manner taking into account all spectrum bands and therefore availability of spectrum in all bands

is essential from network planning, investment, and execution perspective as well. **WRC-19 has already identified 26 GHz band (n258) (i.e., 24.25 GHz – 27.5 GHz) as an IMT band on a global level. Spectrum in 28 GHz band (n257 band) (i.e., 26.5 GHz – 29.5 GHz) is allotted for IMT services in several nations.** Currently, more than 160 operators in 44 countries have invested in 5G networks across the 24.25 GHz – 29.5 GHz spectrum. **It may also be noted that the report of the 5G High Level Forum prepared by the Steering Committee in August 2018 has already considered 24.25 – 27.5 GHz and 27.5 – 29.5 GHz as part of Announce Tier for IMT services.**

- c. We further submit that within mmWave band – n257 band is more important than n258 for 5G. **n257 has relatively better device ecosystem compared to n258 primarily driven by US market.** In future n257 will also be driven by Asian markets (South Korea, Japan etc.). n258 ecosystem development is relatively slower and is primarily led by Europe.

Spectrum	Device Ecosystem	Global Deployment
n257(26.50-29.50) GHz	~35 Phones, 3 Tablets	Planned/in progress: South Korea (26.5-28.9) GHz, Japan (27-28 GHz/ 29.1-29.5 GHz) Taiwan, Singapore
N258 (24.25-27.50) GHz	~7 Phones	Planned/in progress: Thailand, Finland, Italy, Germany, France

- d. As mentioned above, spectrum in **28 GHz band (n257 band) (i.e., 26.5 GHz – 29.5 GHz) is allotted for IMT services in several nations as detailed below**

Country	From	To	Remarks
USA	27.5 GHz	28.35 GHz	
Republic of Korea	26.5 GHz	28.9 GHz	
Japan	27.8 GHz	28.2 GHz	
	29.1 GHz	29.5 GHz	
	28.2 GHz	29.1 GHz	Local 5G networks
Taiwan	27.9 GHz	29.5 GHz	
Norway	28.3325 GHz	28.4445 GHz	
	29.3405 GHz	29.4525 GHz.	
Uruguay	27.5 GHz	28.35 GHz	
Hong Kong	27.95 GHz	28.35 GHz	Local licenses
Canada	27.5 GHz	28.35 GHz	Auction in 2022

- e. We understand that DoT has sought recommendations for **spectrum in mmWave (24.25 GHz to 28.5 GHz) for terrestrial 5G system based upon the decision of Committee of Secretaries (CoS). Therefore, we suggest that the remaining 1 GHz (28.5 GHz – 29.5 GHz) may be recommended for assignment through an auction for the flexible use/mixed use by Telecom Service Providers (TSPs) for both terrestrial and satellite networks so as to get the true market value.**

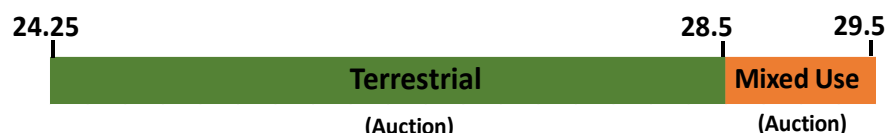


Figure: Proposed allocation mechanism

- f. The buyer should be allowed to have a mixed use. Such mixed use should be without any additional technical restrictions in terms of power levels, base station tilt etc., neither in this band nor in any adjacent bands, which otherwise will make it unusable for terrestrial use. Further, **the buyer should be allowed to sub-lease the part of this 1 GHz at any place for gateway operation of the satellite operator.** This methodology will ensure optimal utilization of resources apart from Government getting full market value through such auction for terrestrial/mixed use, and the satellite operator can get it on sub-lease from the successful buyer for the gateway locations at a fraction of the market price.
- g. In view of the above, we reiterate that considering **importance of mmWave band for true 5G experience** and its requirement for a country like India, **Entire band from 24.25 – 29.5 GHz should be reserved for IMT/5G service with a provision of mixed use in 28.5-29.5 GHz range.**
8. **Spectrum in V-band (52.4 GHz to 71 GHz) and E-band (71GHz - 76 GHz paired with 81 GHz-86 GHz)**
- a. E-Band (71-76 & 81-86 GHz) is a paired spectrum used in FDD mode. It is suitable for high capacity backhaul for mobile 4G/5G mobile networks and also suitable as access spectrum for delivering broadband services to the end users. **It can be used for connecting enterprise buildings with high-capacity links with the use of outdoor CPE (ODCP). It is already identified as backhaul for 5G and is also deemed useful for Integrated Access Backhaul (IAB) under 5G.**
- b. V-Band (52.4 - 71 GHz) is un-paired spectrum used in TDD mode and is suitable as high capacity backhaul spectrum for mobile 4G/5G mobile network and also

suitable as Access Spectrum both for 5G and Wi-Fi and can also be used for connecting enterprise building with high-capacity access links.

- c. **WRC-19 has already identified the upper portion of V band (66-71 GHz) for IMT / 5G services, and no country has delicensed this band post that.** With passages to time the lower portion of spectrum may also be considered for IMT (5G/6G) services. **3GPP has already identified 52.6-71 GHz for 5G NR (New Radio). Further, V-Band and Integrated Access Backhaul (IAB) are an integral part of the 3GPP study for 5G.**
- d. There is a demand to delicense these bands for use in public Wi-Fi networks. However, the same is not justified, as public Wi-Fi, even without full mobility and only hotspot coverage will be directly competing with 5G and **would be a substitutable broadband service and thus should only be provided through licensed spectrum only following principle of "Same Service Same Rule"**. Further, wide and indiscriminate adoption of delicensed spectrum will cause serious interference issues thus rendering these bands technically unusable for 5G. The Authority should also bear in mind that de-licensing of spectrum is a one-way irreversible process encouraging first cum first serve principle denounced by Hon Supreme Court in 2G case apart from causing loss to the exchequer. While upper part-of the band is already identified for IMT in WRC-19, **in the event balance part also get identified for IMT – it cannot be implemented if the spectrum is already delicensed. This is established by the fact that countries which have delicensed entire 6 GHz band for Wi-Fi services are now not able to reverse it when 6.425 – 7.025 GHz is being considered for IMT in WRC-23.**
- e. In view of the above, we request the Authority to include all the spectrum in these bands in scope of 5G auction. The de-licensing option for E and V Band Spectrum should be completely rejected as it is **not only legally untenable but also encourages favoritism, non-level playing field, violates "Same Service Same Rule" principle apart from coming at a great loss to the exchequer; causing technical issues like interference; bringing in inherent inefficiencies and is detrimental to investor's confidence.**

B. Valuation of spectrum and reserve price

The valuation of spectrum is the **most germane aspect of any auction related consultation exercise. We submit that in current circumstances the valuation requires paradigm shift in approach being followed at present.** We submit that the time has come to **delink the spectrum valuation from maximization of one- time spectrum auction proceeds and instead link it with national objectives, proliferation goals, societal and**

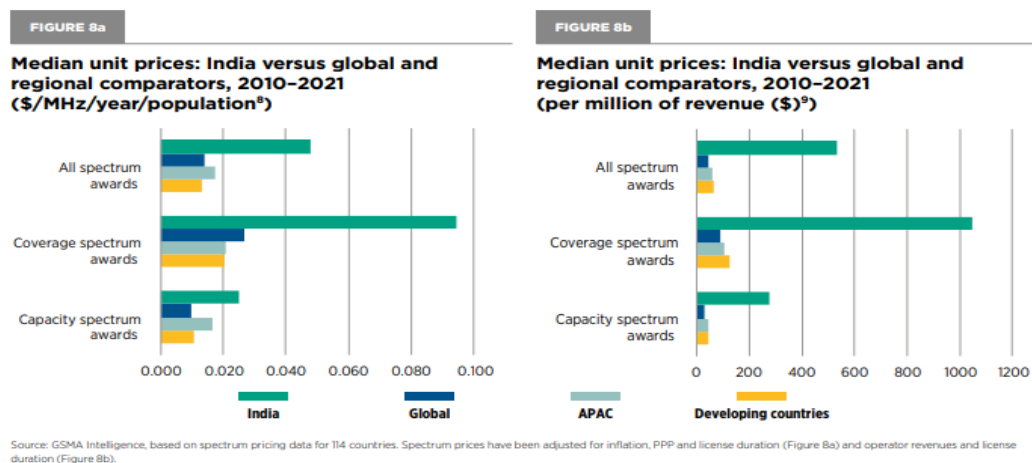
economic impact on all spheres of life and to regenerate demand of spectrum and competition in sector and to ensure that no spectrum remains unsold. It will not be out of context that the auction of 2010 for 3G and BWA spectrum was in different circumstances with many numbers of players and no visibility of additional spectrum in 900/1800 MHz band for expansion which has not only led to exorbitant increase in price of the spectrum in 2100/2300 MHz band but the exorbitant prices of other spectrum bands the price of which was linked with the price of 2100 MHz/2300 MHz band. This has resulted in huge financial burden on the TSPs compelling government to offer relief packages.

9. **Objectives of the auction:** The **objective of the auction should be alienation of scared natural resource i.e. spectrum in 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. However, efficient utilization of spectrum has been continually falling before the revenue maximization due to its high valuation as a result of factors like survival auction, more number of players with no visibility of additional spectrum availability like in 2010, use of last auction price with indexation, not putting all available spectrum to auction due to non harmonisation in a band etc. The availability of spectrum in 1800 MHz till 2015 and failure to auction very important spectrum like 700 MHz band in multiple auctions establishes this fact beyond any doubt.**

10. **Past Auction Results:** We submit that innovative spectrum reforms and intensive spectrum requirements under 5G and beyond technologies demand a paradigm shift in spectrum pricing policy and rationalization of reserve price. Therefore, in our submission **the past auction prices should not be a relevant criterion for a new spectrum band, and over-reliance on auctions prices of 1800 MHz band to arrive at prices of these bands is not rational and need to be curtailed. The better technical efficiency based approximation can be derived from other bands.**

11. **International Benchmarking:** We submit that for new 5G bands, international benchmarking seems to be a **much better option than any other measure, as this is derived from actual marketability assessments across the band rather than some imaginary numbers based on efficiency factor.** We submit that benchmarking with international prices will reveal that Indian reserve price of almost Rs. 50,000 Crore for a 100 MHz slot in 5G mid-bands is about 70 times the market value in comparable western countries indicating that this valuation is excessive and needs to be pared down considerably. GSMA report¹ of September 2021 clearly depicts that spectrum awards in India have always exceeded the international benchmarks by multiples as shown below.

¹ <https://www.gsma.com/spectrum/wp-content/uploads/2021/09/India-5G-Spectrum.pdf>



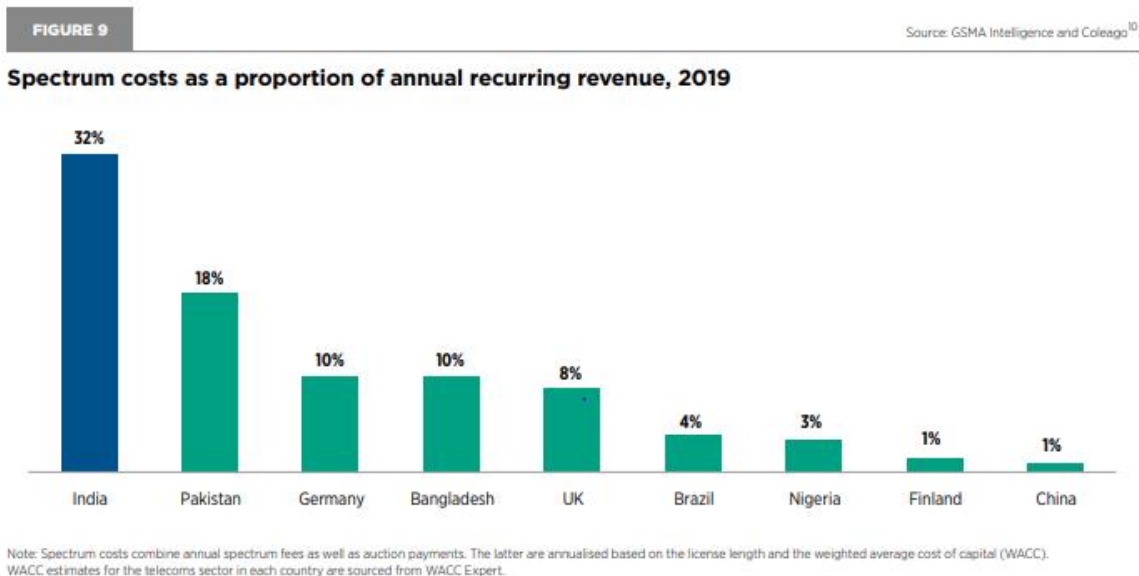
12. In view of this, we understand that the **reserve price for mid-band spectrum should be brought down by around 95% for a Pan India 100 MHz block and the reserve price of mmWave bands should be kept at 1/100th of mid band, and that of spectrum in V-Band and E-band should be kept at 50% of mmWave, considering low ARPU, purchasing Power in India and International benchmarks.**

13. **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. **As per our understanding 3.5 GHz band require 40% more sites than 1800 MHz to have a similar coverage. Further this band requires 32T32R Massive MIMO to support MU-MIMO and beamforming. Power consumption and cost of Massive MIMO Radio Unit (MRU) is approximately 4 times than 1800 MHz band RU. Due to high power consumption of MRU, it increases SMPS and battery back-up capacity. In addition, further capex will be added on power infrastructure and real estate space. Therefore, Capex and Opex for 3.5 GHz will increase at least by 5 times compared to 1.8 GHz band.**

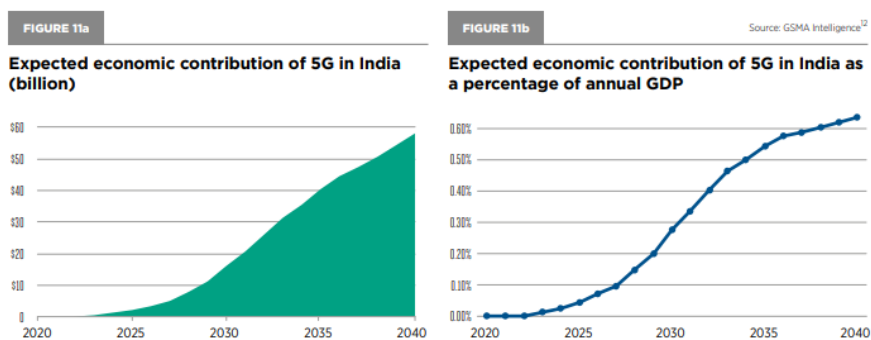
14. **Relevant technical factors:** Further, in addition to the poorer coverage of 3.5 GHz compared to 1800 MHz, another factor which determines technical efficiency of the band is TDD Self Interference due to Tropospheric Ducting effect. **In 2300 MHz band, there is a loss of approximately 20% of capacity on over 70% of the TDD cells, which is likely to increase in case of 3.5 GHz band thus requiring more Capex for similar level of coverage. This is an important factor that should be borne in mind while deriving technical efficiency of TDD bands.** The impact of all these factors will continue compounding as we go up the frequency chart.

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. It is not surprising that large chunks of spectrum remain unsold due to high reserve prices as we have highest spectrum cost in proportion to revenue as depicted in following analysis by GSMA in above referred report.



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. The following figures by GSMA report dated September 2021 (also referred above) shows the impact of 5G on Indian economy.



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 GSMA report² many countries are carefully considering wider economic goals rather than short-term monetary gains.
18. **Reserve Price:** We submit that while consideration of above points will lead us to optimum valuation of the spectrum, the most critical factor in increasing the competitive intensity and to discover true market value of the spectrum would be optimum reserve price. **We submit that 80% of valuation as reserve price is too steep and not conducive of wider participation in auction and throttle competition. It has resulted in selling the spectrum at reserve price and does not lead to discovery of market determined price with competition. Besides obviating the possibility of true market price discovery, it also acts as a deterrent for new entrants which is evident from past experience. Therefore, we request the Authority to reduce the reserve price to 50 % of the spectrum valuation.** We submit this may help in discovery of true market price and will be beneficial in longer run as it will increase spectrum uptake, reduce the wastages due to unsold spectrum, maximize the overall return instead of maximizing the unit price and will also help in meeting proliferation goals while at the same time increasing the overall license fee proceeds.

C. Auction Payment Methodology

19. We submit that Union Cabinet's liberalizing approach should also be reflected in the payment methodology for the auction dues of TSPs. **The deferred payment scheme should be treated as a financing scheme for building vital national infrastructure and not as a monetization option.** We submit that many of the spectrum bands being put to auction are being auctioned for the first time and with the present ecosystem status and propagation characteristic of mid-band and high-band spectrum, TSPs are expected to take minimum 4 to 5 years to set up reasonably ubiquitous 5G network. Therefore, we submit that there should be **10% upfront payment requirement to ensure TSP's commitment, followed by a 5 year moratorium in payments. The remaining part of the payment should be spread over the remaining 25 years of spectrum validity. Further, the interest on these EMIs should be charged same as RBI Repo rate i.e., at 4% instead of current practice of very high interest rates.** This will not only support the TSPs in faster roll-out but will also increase auction participation. We further submit that this deferred payment formula should be uniformly applied to all spectrum bands being put to auction.

² <https://www.gsma.com/spectrum/wp-content/uploads/2021/03/Mobile-spectrum-trends-and-insights-Q4-2020.pdf>

D. Allocation of backhaul Spectrum

20. **Considering the emerging high requirements of backhaul for the 5G roll-out, meeting NDCP-2018 objectives and associated national goals, it is imperative that requisite backhaul spectrum be made available for providing communication services.**
21. **The Authority should push for auction of backhaul spectrum, especially in high-capacity bands for TSPs** so that the industry can meet the demands of exponentially growing traffic and transition towards 5G. Spectrum in E-Band and V-Band can also play a very critical role in this aspect, owing to its use case of **integrated Access Backhaul and wireless to home network.**
22. As per judgements **of Hon'ble Supreme Court, spectrum for public telecommunication can only be alienated through Auction.** Therefore, **all spectrum identified for Access and/or microwave Backhaul and/or E&V bands for providing communication services, irrespective of the technology or medium i.e. terrestrial or satellite, should be allocated only through the auction methodology.** The auction based Backhaul allocation policy should be implemented as soon as possible.

E. Eligibility Conditions and Roll-Out obligations, Spectrum Cap, Surrender of spectrum

23. **Eligibility Conditions:** We submit that there is no need to re-agitate the eligibility conditions for participating in auction. As per Indian Telegraph Act 1885, establishing, working, and maintaining Telegraph can only be done under an appropriate license issued by the Government and as currently Unified License regime is in place, **thus any applicant seeking acquire spectrum for establishing public/private network should do so only under applicable UL authorization.** Evidently, the current eligibility conditions under NIA suffice the requirements.
24. **Roll-out obligations:** We further submit that roll-out obligations are required to ensure optimum utilization of spectrum and the current roll-out obligations suffice to meet the requirements. We do not think there is a need to change the same for existing bands. Further, the roll-out obligations for new bands being put to auction for first time should be suitably derived from existing obligations post considering the device ecosystem and deploy ability and band plans. The Authority is requested to not re-assign the USOF responsibilities to licensees. **Further, as per the existing NIA conditions, 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 spectrum band by a licensee.**

25. **Spectrum cap:** We submit that the role of spectrum cap is to ensure and maintain sufficient competition in market and prevent monopolization of valuable national resources. **We submit that the monopolization is not possible when large amount of spectrum remains unsold. Further, in an effectively 3 player market, the 35% cap is not suitable for promoting competition as this may lead to quasi-administrative allocation in some prized bands therefore it should be 50%.**
26. **Surrender of Spectrum:** We submit that the Union Cabinet has provided the facility of surrender of spectrum post 10 years of acquiring spectrum in future auctions and this order should be implemented in letter and spirit. **Further, in order to prevent misuse and speculative behaviour, it should be permitted only for the future auctions in line with the Union Cabinet decision and the valuation of the surrendered spectrum should be at lower of the paid price and the current market price as the spectrum holder will have option to either surrender the spectrum to Government or sell it any other TSP through spectrum trading route.**

F. Spectrum for captive private networks

27. We submit that there is **no valid justification in providing auctioned spectrum for free to certain enterprises for availing captive licensed services. This proposal is neither legally tenable nor suitable for orderly growth of telecom sector.**
28. We submit that the Hon'ble Supreme Court in its judgement dated 2nd February 2012 in CWP 423 of 2010 has clearly and unambiguously enunciated that **right to use spectrum used for building public/private networks can only be alienated by a well-publicized transparent auction.** The proposed captive networks would essentially be commercial networks in nature and would be used to enhance profitability of the industries, thus assigning the valuable national resource free of cost or at an administrative price to these industries would be travesty of Hon'ble Supreme Court judgement.
29. Further, this is not the only option available to the captive networks, **TSPs have been serving the captive networks over the years and would continue to do same.** Enterprise business contributes substantial revenue of TSPs that is also factored in at the time of valuation of spectrum and bidding in the auctions, and any such regime will adversely affect TSP's viability. Today TSPs can provide CUG to meet the requirements of an industry/ organization utilizing its existing resources. The concept of private captive networks was introduced when Government as service provider was not able to meet the communication requirements of industry due to fund and time limitation which is not the case at present with opening of the sector. **Nevertheless, in case certain industries are not willing to avail TSPs services, then they should be given the option of setting up their own captive network under an appropriate Unified License authorization post acquiring**

spectrum in the auction. We submit that post implementation of Cabinet decision of AGR definition, in letter and spirit, there will be no constraint for any non-core telecom enterprises to obtain the Unified license.

30. Another way to enable these industries have their own captive networks is by permitting the TSPs to lease spectrum to all those entities that have obtained an appropriate UL authorization.

31. We also bring your kind attention to GSMA policy paper³ on ‘Mobile Networks for Industry Verticals: Spectrum Best Practices’ dated July 2021, wherein GSMA has brought out the risks and downsides of allocating free spectrum for captive industrial use. We are extracting and reproducing the important points herein below:

- **Commercial mobile operators support the needs of a wide variety of vertical sectors and will have added capabilities with 5G**
- **Spectrum leasing or, when carefully planned, other types of spectrum sharing can be viable options for supporting verticals who want to build private networks**
- **Spectrum that is set-aside exclusively for verticals in core mobile bands risks being underused and can undermine fair spectrum awards**
- **Spectrum that is set-aside for verticals in core mobile bands can also threaten the wider success of 5G – including slower rollouts, worse performance and reduced coverage**
- **Policymakers should consider the coexistence challenges when different use cases need to be supported in the same mobile band**

32. In view of the above, we submit that spectrum identified or likely to be identified for use of IMT/ commercial services should be auctioned and there shall be no Spectrum reservation for Private Captive Networks. Instead, the Authority should encourage setting up of such networks under UL framework by utilizing existing resources allocated transparently.

33. Conclusions

- 1. All internationally identified spectrum should be put to auction in forthcoming auction.**
- 2. Auction should remain the only mode for acquiring spectrum usable for public/private communication networks**

³ <https://www.gsma.com/spectrum/wp-content/uploads/2021/07/Mobile-Networks-Industry-Verticals.pdf>

3. The objective of the auction is to ensure efficient use of spectrum by allowing operators to use it optimally through terrestrial or satellite media as per their network and business plans.
4. Complete C-band (3.3 GHz to 4.2 GHz) and mmWave (26 GHz (24.25 – 27.5 GHz), 28 GHz (27.5 – 29.5 GHz) alongwith spectrum in V-band (52.4 GHz to 71 GHz) and E-band (71GHz - 76 GHz paired with 81 GHz- 86 GHz) should be put to auction
5. Spectrum valuation should be rationalized post considering international benchmarking, revenue potential of spectrum, cost of network and proliferation goals and its impact of overall economy
6. The reserve price for C-band should be reduced by 95% from previous recommendations and the same for mmWave should be 1% of C-band and that of spectrum in V-Band and E-band should be 50% of mmWave
7. The reserve price should be kept at 50% of spectrum valuation
8. The deferred payment option should be eased out by introducing 10% upfront payment, 5 year moratorium, 25 EMI payments with 4% interest rate
9. The Backhaul question should be addressed by auctioning this spectrum alongwith leveraging Integrated Access backhaul use case of V-band and E-band
10. The spectrum cap should be used judiciously to promote competition and it should not lead to quasi administrative assignment
11. No spectrum to be set aside for private captive networks as their requirements can be met under the existing UL framework with implementation of Cabinet decision on AGR definition
12. There is no need to re-visit the eligibility conditions for participating in auction.
13. Surrender of spectrum decision should be implemented prospectively and using optimum valuation techniques
14. Overall Spectrum cap should be 50% instead of present 35%.
15. Current roll-out obligations are sufficient with exiting provision of rollout obligation being treated as fulfilled for all bands on meeting the same by use of any technology in any band by a licensee.

Issue wise response:

Q.1 Whether spectrum bands in the frequency range 526-617 MHz, should be put to auction in the forthcoming auction? Kindly justify your response.

And

Q.2 If your answer to Q1 above is in affirmative, which band plans and duplexing configuration should be adopted in India? Kindly justify your response.

RJIL Response

1. We reiterate our submissions that **all spectrum that can be put to use in public or private communication networks should be auctioned and spectrum in the frequency range 526-617 MHz is no exception.** Therefore, this band should be auctioned along with other IMT bands in the forthcoming auction of spectrum.
2. We submit that the Authority has already indicated in the consultation paper that there is sufficient international interest in this band for IMT with ITU having identified spectrum in 470-698 MHz as an IMT band in Region 2 & Region 3 with on record assignment of this spectrum is in the USA and Puerto Rica. Further, GSA reports also indicate increasing interest in this band thus, there should not be any hesitation in putting this spectrum to auction.
3. We further submit that once a major country like India decides to auction this spectrum, then the ecosystem development is bound to pick up the pace, thus auctioning this spectrum would be akin to a positive signal for ecosystem development. The band plans and duplexing configuration should be similar to 700 MHz band. We have explained this piece in more detail in response to Q4.

Q.3 In case your answer to Q1 is in negative, what should be the timelines for adoption of these bands for IMT? Suggestions to make these bands ready for adoption for IMT may also be made along with proper justification.

RJIL Response: Not applicable in view of response to Q1 and Q2.

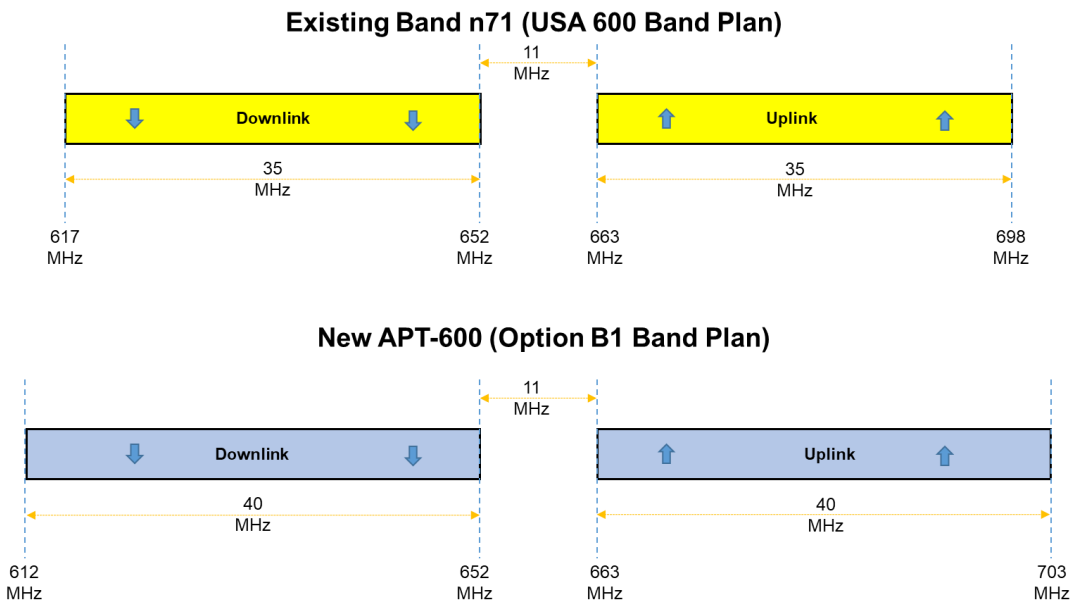
Q.4 Do you agree that 600 MHz spectrum band should be put to auction in the forthcoming auction? If yes, which band plan and duplexing configuration should be adopted in India? Kindly justify your response.

RJIL Response

1. As mentioned in the previous response there should be no doubt in putting to auction the spectrum in 600 MHz band. **We submit that this band has great potential for improving the coverage of wireless broadband and would be very significant in remote and rural areas.**
2. Considering that 5G is step change from 4G, requiring to support not just eMBB but also uRLLC and mMTC services, **there is a need for more spectrum not just in capacity layer, but also in the coverage layer including sub-1GHz band.** Currently, TSPs typically have ~2x10MHz sub-GHz band spectrum in 4G. **In the context of 5G, it is recommended that**

initially at least 2x20MHz of sub-GHz spectrum per operator would be required. This requirement can go up considerably once the adoption picks up. Thus with 4 operational service providers in the country, minimum 2x80MHz spectrum is required in sub-1GHz bands initially and more would be required going forward.

3. Further as 800MHz and 900MHz bands are left with very little spectrum, the new 600MHz and 700MHz are the potential candidates for this requirement. Furthermore, as opposed to 2x45MHz spectrum available in 700MHz band as per APT-700 band definition (B28/n28), after 2x10MHz spectrum allocation to defence and another 2x5MHz likely to be allocated to Railways, only 2x30(5) MHz might be left for allocation for IMT/5G.
4. We submit that in 600MHz band, there are two potential band plans that may be considered for adoption i.e. existing Band n71 (USA 600 Band Plan) and the upcoming Band APT-600. However, as seen from the below Band plan diagram, n71 offers 2x35MHz spectrum with a centre gap of 11MHz, while APT-600 offers 2x40MHz spectrum with a centre gap of 11MHz.



Band	Downlink(MHz)	Uplink(MHz)	BW
n71	617 – 652	663 – 698	2x35MHz
APT-600 (B1)	612 – 652	663 – 703	2x40MHz

5. We further submit that APT-600 (B1) is currently not defined in 3GPP as NR FR1 band and is expected to be included in the 3GPP Release 17 and device ecosystem is expected to develop in the due course of time. However, there is a strong interest from Region 3 in

the APT discussions on extending 600 MHz band to utilize full 40 + 40 MHz. Whereas n71 band currently has limited deployment and ecosystem with footprint in North America only.

6. It is pertinent to mention here that existing n71 band devices are not likely to be compatible with APT-600 (B1). However, given that 3GPP Specifications have support for handling overlapping frequency bands with different frequency options using Multi-Frequency Band Indicator (MFBI), it may be possible to enable compatibility between n71 and Option B1 in future.
7. **To summarize, currently APT-600 (B1) does not have any ecosystem, while n71 has nascent ecosystem. In terms of the quantum of spectrum APT-600 offers a better Band plan, given the quantum of usable spectrum is more. In future APT-600 band likely to witness larger adoption. In line, APT-600 is the recommended band plan for India. We recommend that APT-600 (2x40MHz) should be adopted in India for 5G services as this will help Telecom operators to provide high quality 5G services in rural & remote rural areas in cost efficient manner.**
8. **Additionally, in order to achieve the objective of harmonised frequency arrangement and optimum utilization of this spectrum, it is also important to ensure that there are no other services/ authorizations given for this band utilization on either co-primary or secondary basis.**

Q.5 For 3300-3670 MHz frequency range, which band plan should be adopted in India? Kindly justify your response.

RJIL Response

1. At the outset, we reiterate our submission that entire C-band spectrum should be put to auction. We submit that the spectrum in **3300-3670 MHz band, also known as C-Band, offers balance in coverage and capacity and supports a wide range of 5G use cases (Industry 4.0, Health Care, AR/VR, Smart Cities, etc.) and has become a default anchor band for 5G globally.** Therefore, it would be prudent to follow the globally accepted TDD band plan for this band in order to have internationally harmonised band plan and derive the dividend of economies of scale.
2. This will ensure no challenges in terms of network equipment availability across the entire band put up for auction and from User Equipment perspective, the device ecosystem development will certainly be accelerated once a major population like India adopts this band plan.

3. We further submit that **in order to achieve interference free smooth and early deployment of this spectrum, the frequency spot assignment should be could be determined by the final bidder ranking in the auction so that the 1st rank bidder could get his preferred slot in this band and so on. Such rank based allocation is already being followed for assignment of spectrum in 900 MHz band.**
4. **Further, in case this TSP has 1st rank in majority of LSAs, then it should be provided spectrum slot of its choice in all LSAs and so on in order to ensure harmonized deployment at the very start. Needless to mention that in case a TSP acquires more than one block, the entire spectrum should be assigned to it in contiguous form.**

Q.6 Do you agree that TDD based configuration should be adopted for 24.25 to 28.5 GHz frequency range? Kindly justify your response

And

Q.7 In case your response to Q6 is in affirmative, considering that there is an overlap of frequencies in the band plans n257 and n258, 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 only a part of mmWave band i.e. 24.25 to 28.5 GHz and reiterate our submission that considering importance of mmWave band for true 5G experience entire band from 24.25 – 29.5 GHz should be reserved for IMT/5G service.**
2. We submit that WRC-19 has already identified 26 GHz band (n258) (i.e., 24.25 GHz – 27.5 GHz) as an IMT band on a global level. While the spectrum in 28 GHz band (n257 band) (i.e., 26.5 GHz – 29.5 GHz) is allotted for IMT services in several nations including USA, Republic of Korea, Japan, Taiwan, Norway. Currently, more than 160 operators in 44 countries have invested in 5G networks across the 24.25 GHz – 29.5 GHz spectrum. Therefore, we submit that for efficient spectrum allocation, **the Authority should recommend auctioning complete spectrum range in n257 & n258 bands (24.25 GHz – 29.5 GHz) for terrestrial 5G/IMT services.**
3. **Further, instead of reserving 1 GHz (28.5 GHz to 29.5 GHz) for satellite based communication services, we would suggest including it in 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.**

4. Considering India's population and its density (at 464 PoP/Sq KM it is at multiple times than other countries like Australia (139x), Russia (53x), Brazil (18x), Chile (18x), China (3x), Sweden (18x), USA (13x)), and future growth potential for 5G services across consumer, industries and remote rural geography, India will require at least 1 GHz / operator to start with and 2GHz /Operator in near future. **Recent studies have strongly recommended to carefully consider national 5G spectrum demands in the 2025-2030 timeframe, when 5G usage will be much higher, and plan to make 2 GHz of spectrum available in high-band. Since India has now taken a policy decision to auction spectrum for 30 years, the spectrum requirement need to take into account technology and eco-system development over longer period.**

Q.8 Whether entire available spectrum referred by DoT in each band should be put to auction in the forthcoming auction? Kindly justify your response.

RJIL Response:

Yes, we submit that from a policy predictability perspective all identified and available spectrum should be put to auction in the proposed annual auctions, as has been done all the past auctions conducted till date. Further, the reserve price must be set keeping in mind that all spectrum is sold instead to keeping it unsold as that is a national waste of scarce natural resource. In addition, spectrum in entire C-band and mmWave band, which has not been referred by DOT, but being deployed for 5G services world over also be put to auction.

Issues related to Block Size

Q.9 Since upon closure of commercial CDMA services in the country, 800 MHz band is being used for provision of LTE services,

a. Whether provision for guard band in 800 MHz band needs to be revisited?

b. Whether there is a need to change the block size for 800 MHz band? If yes, what should be the block size for 800 MHz band and the minimum number of blocks for bidding for existing and new entrants?

(Kindly justify your response)

RJIL Response:

1. We submit that under the CDMA band plan the **block size of the spectrum in 800 MHz band was kept 1.25 MHz with actual allocation being 1.23 MHz and remaining 0.2 MHz was used as guard band between channels.** Thus, while the spectrum valuation and charging were at 1.25 MHz basis, the actual allocation was always 1.23 MHz. Such glaring anomaly exists only in case of 800 MHz band.

2. This could have been a suitable implementation for CDMA technology, but with closure of commercial CDMA services and advent of LTE services in 800 MHz band, it has become irrelevant. **We submit that with only auctioned spectrum in this band, and exclusively LTE technology deployment, there is no longer a requirement of this guard band. Therefore, this requirement should be removed, and entire 1.25 MHz channel frequency should be allocated to TSPs to ensure that they are given what they paid for.**
3. In view of this, we submit that while there is no need to revisit the 1.25 MHz block size, however, there is a need to allot entire quantum of 1.25 MHz to TSPs. **This implementation should also cover the existing licensees as they have already paid the auctioned determined price for 1.25 MHz spectrum and therefore are entitled to receive 1.25 MHz spectrum in place of actually allocated 1.23 MHz block size.**

Q.10 Do you agree that in the upcoming auction, block sizes and minimum quantity for bidding in 700 MHz, 900 MHz, 1800 MHz, 2100 MHz, 2300 MHz and 2500 MHz bands, be kept same as in the last auction? If not, what should be the band-wise block sizes and minimum quantity for bidding? Kindly justify your response.

RJIL Response:

We do not think that there is a need to change the block sizes and minimum quantity for bidding in 700 MHz, 900 MHz, 1800 MHz, 2100 MHz, 2300 MHz, and 2500 MHz bands, therefore we may continue with the block sizes and minimum quantity followed in auction held in March 2021.

Q.11 In case it is decided to put to auction spectrum in 526-698 MHz bands, what should be the optimal block size and minimum quantity for bidding? Kindly justify your response.

RJIL Response:

We submit that this spectrum should be put to auction and in line with the 700 MHz band plan adoption, the block size and minimum quantity for bidding should also be same as spectrum in 700 MHz i.e., 5 MHz paired spectrum.

Q.12 What should be optimal block size and minimum quantity for bidding in 3300-3670 MHz band? Kindly justify your response.

RJIL Response:

1. We submit that this spectrum will be put to use for 5G services, although the optimal bandwidth requirement will be 100 MHz, but a minimum 50 MHz would be required

for 5G. The minimum bandwidth of 50 MHz can be achieved either by keeping the block size of 10 MHz with a minimum bidding quantity of 5 blocks or by keeping the block size as 50 MHz.

2. We understand that keeping 10 MHz block size would be a better option from harmonized spectrum allocation perspective as well. But minimum quantity shall be kept at 50 MHz.

Q.13 What should be optimal block size and minimum quantity for bidding in 24.25-28.5 GHz? Kindly justify your response.

RJIL Response:

We submit that for optimum deployment, bare minimum quantity is 200 MHz would be required. Therefore, it may be useful to keep the block size of 100 MHz with a minimum bidding quantity of 2 block.

Issues related to Eligibility Conditions for Participation in Auction

Q.14 Whether any change is required to be made in the existing eligibility conditions for participation in Auction as specified in the NIA for the spectrum Auction held in March 2021, for the forthcoming auction? If yes, suggestions may be made in detail with justification.

And

Q.15 In your opinion, should the suggested/existing eligibility conditions for participation in Auction, be made applicable for the new spectrum bands proposed to be auctioned? If not, what should be the eligibility conditions for participating in Auction? Kindly justify your response.

RJIL Response:

We submit that the eligibility criteria as defined in the NIA 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.

Issues related to Interference mitigation in TDD bands

Q.16 Is there a need to prescribe any measure to mitigate possible interference issues in 3300-3670 MHz and 24.25-28.5 GHz TDD bands or it should be left to the TSPs to manage the interference by mutual coordination and provisioning of guard bands? Kindly provide justification to your response.

And

Q.17 In case your response to the above question is in affirmative,

a. whether there is a need to prescribe provisions such as clock synchronization and frame structure to mitigate interference issues, as prescribed for existing TDD bands, for entire frequency holding or adjacent frequencies of different TSPs? If yes, what should be the frame structure? Kindly justify your response.

b. Any other measures to mitigate interference related issues may be made along 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 submitted in response to previous question, permitting the rank holder to choose the frequency spot would be an optimum solution, which has already been tried and tested in the auction of 900 MHz band. 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 the bands although will require auction process software upgradation**
2. In addition to providing a harmonized spectrum allocation, it will also ensure enhanced competition in auction wherever a particular spot is found more useful within the band for instance say 3300 – 3500 MHz within 3300-3670 MHz band or N257 band i.e. 26.5 – 27.5 GHz in mmWave spectrum.
3. In addition to above, to mitigate interference issues of the TDD band more effectively, we submit that all regulation for TDD bands should be similar to the ones prevailing under LTE Band 40 for instance GPS 1 PPS Synchronization and Use of Identical DL:UL Ratio across the operators, which is to be prescribed as part of auction conditions.

Issues related to Roll-out Obligations

Q.18 Whether the roll-out obligations for 700 MHz, 800 MHz, 900 MHz, 1800 MHz, 2100 MHz, 2300 MHz and 2500 MHz as stipulated in the NIA for last auctions held in March 2021 are appropriate? If no, what changes should be made in the roll out obligations for these bands?

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.

2. Accordingly, we recommend no change in the current roll-out obligations for spectrum in 700 MHz, 800 MHz, 900 MHz, 1800 MHz, 2100 MHz, 2300 MHz, and 2500 MHz. **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.**

Q.19 What should be associated roll-out obligations for the allocation of spectrum in 526-698 MHz frequency bands? Should it be focused to enhance rural coverage? Kindly justify your response.

RJIL Response:

1. In addition to submissions made in response to Q.18, it is submitted that as the propagation qualities and technical parameters of sub 1-GHz bands are comparable, we do not feel that there should be any disparity in roll-out obligations of sub 1-GHz bands, and accordingly the roll-out obligations for spectrum in 526-698 MHz frequency bands should be same as the spectrum in 700 MHz band.
2. However, considering the evolving device eco-system in this band, 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.
3. Further, we do not agree with the proposal of prescribing some new definition to roll-out obligations in order to cover the uncovered areas. We submit this is the designated job for USO Fund and it will be unfair to saddle the TSPs with such a responsibility post collecting huge unutilized amounts in USO Fund.

Q.20 What should be associated roll-out obligations for the allocation of spectrum in 3300-3670 MHz frequency band? Kindly justify your response.

And

Q.21 What should be associated roll-out conditions for the allocation of spectrum in 24.25 to 28.5 GHz frequency range? Kindly justify your response.

RJIL Response:

1. We reiterate our submissions that in order to promote effective utilization of finite natural resource, there should be roll-out obligations for all spectrum bands, however, the same should be consistent with the current policy on roll-out obligations wherein

compliance with MRO requirements with one technology and spectrum band should suffice for any additional spectrum bands acquired by the TSP.

2. For stand-alone operators in the 5G bands of 3300-3670 MHz and 24.25-28.25 GHz spectrum bands, the MRO compliance requirement can be same as that of other spectrum bands. The Authority may consider giving some additional time to meet MRO to new TSPs proposing to have stand-alone networks in this band.

Q.22 While assessing fulfilment of roll out obligations of a network operator, should the network elements (such BTS, BSC etc.), created by the attached VNO, be included? If yes, kindly suggest the detailed mechanism for the same. Kindly justify your response.

RJIL Response:

We submit that the roll-out obligations of a licensee are part of the NIA and license conditions and need to be complied with by the successful bidder with or without permissible sharing of infrastructure. Therefore, the network elements installed by its VNO operator are irrelevant to the coverage requirements and should not be considered while assessing the compliance with MRO.

Issues related to Spectrum Cap

Q.23 Whether there is a need to review the spectrum cap for sub-1 GHz bands? If yes, what should be the spectrum cap for sub-1 GHz bands. Kindly justify your response.

RJIL Response:

1. We submit that there are no material changes to indicate any requirement for a change in the spectrum cap in sub 1-GHz bands and existing spectrum cap of 50% of all sub 1- GHz band should be continued. The spectrum in 526-698 MHz, being put to auction for the first time should also be included in the total spectrum available for the calculation of spectrum cap for sub 1-GHz bands.
2. **We submit that apprehensions of monopolization of spectrum bands are misplaced in Indian context, when a large amount of spectrum remains unsold in almost all recent auctions.**

Q.24 Keeping in mind the importance of 3300-3670 MHz and 24.25-28.5 GHz bands for 5G, whether spectrum cap per operator specific to each of these bands should be prescribed? If yes, what should be the cap? Kindly justify your response.

RJIL Response:

1. The Authority has already recognized that the spectrum requirements and consequently allocation in 5G mid band and mmWave will be nothing like the current allocation of 5-10 MHz and it will involve 100s MHz and GHz type of allocations, therefore policies like spectrum cap should also reflect this paradigm shift.
2. **The Authority should go beyond the myopic 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 of 3300-3670 MHz and 24.25-28.5 GHz.**
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 even a cap of 100 MHz for a 370 MHz auction will lead to quasi-administrative allocation at reserve price. **Therefore, 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.**

Q.25 Whether there should be separate spectrum cap for group of bands comprising of 1800 MHz, 2100 MHz, 2300 MHz and 2500 MHz bands together? If yes, kindly suggest the cap along with detailed justification.

RJIL Response:

We submit that there is no significant change in availability or technical and strategic importance of these bands to prompt any new thinking with respect to spectrum cap. Neither has the consultation paper provided any such justification, therefore, we submit that there is no need of a separate spectrum cap for group of bands comprising of 1800 MHz, 2100 MHz, 2300 MHz and 2500 MHz bands.

Q.26 Whether overall spectrum cap of 35% requires any change to be made? If yes, kindly suggest the changes along with detailed justification.

And

Q.27 For computation of overall spectrum cap of 35%, should the spectrum in 3300-3670 MHz and 24.25-28.5 GHz bands be included? Kindly justify your response.

RJIL Response:

1. We submit that **overall spectrum cap of 35% in an effectively three operator/bidder scenario has become irrelevant. Therefore, in order to discover true market value of the spectrum and unleash the competitive forces and enable the paying licensees to acquire more spectrum, the Authority is requested to increase the overall spectrum cap to 50% of all available spectrum.**
2. The spectrum in 3300-3670 MHz and 24.25-28.5 GHz bands will be an integral part of the integrated 5G communication networks of the future, therefore, we don't see any reason for not considering this spectrum as part of overall spectrum cap.
3. **In view of the above, we submit that the spectrum in 3300-3670 MHz and 24.25-28.5 GHz bands should be included in the overall spectrum cap of 50%.**

Q.28 Any other suggestion regarding spectrum cap may also be made with detailed justification.

RJIL Response: None

Issues related to Surrender of Spectrum

Q.29 What should be the process and associated terms and conditions for permitting surrender of spectrum for future auctions? Kindly justify your response.

And

Q.30 What provisions may be created in the spectrum surrender framework so that any possible misuse by the licensees, could be avoided? Kindly justify your response.

RJIL Response:

1. At the outset, we welcome the Cabinet decision on promulgating an exit policy under surrender of spectrum, however, **we submit that as per the Cabinet decision, this policy should be implemented for the spectrum to be acquired in subsequent auctions only** and should not be applicable for spectrum acquired in previous auctions, as this condition was not part of NIAs for previous auctions and introducing it now would amount to **vitiating the auction by changing the material conditions retrospectively.**
2. Thus, the surrender of spectrum should be made a part of the future NIAs and should be applicable only for spectrum acquired post issuance of the policy.
3. We submit that the surrender of spectrum policy should be implemented keeping in mind both the critical requirements in this regard i.e., facilitating serious TSPs to

surrender spectrum surplus to their requirements and to avoid misuse of the surrender provisions. Accordingly, we submit that sufficient safeguards should be built in the provisions for surrender of spectrum to ensure optimum utilization of spectrum resources while at the same time providing an easy way out from non-productive long term spectrum commitments.

4. We submit that the Cabinet decision has already provided for a lock-in period of ten years from date of allocation of spectrum. This will give the TSP sufficient opportunity to deploy the spectrum and monetize the spectrum, however, if the TSP finds that the spectrum is surplus to its requirements then, it should be permitted to surrender it.
5. **The valuation of the spectrum to be surrendered should be done basis the current market price of the said spectrum.** As the Government has decided to hold annual auction of all available spectrum, the surrendered spectrum should be made part of the next upcoming auction. **The valuation of the surrendered spectrum should be lower of the current market price and Net Present Value (NPV) of the price at which spectrum was obtained, in order to protect Government revenue as well as prevent speculative behaviour. This will be the surrender value of the spectrum.** Anyhow, if there is excess demand for such spectrum, the TSP can opt for spectrum trading to get higher valuation.
6. Further, the payment methodology adopted by the TSP at the time of acquiring the spectrum would decide on how it will be refunded the amount against the surrendered spectrum. In case the TSP had opted for upfront payment, it should be refunded the amount basis the surrender value of the spectrum. In case the TSP had opted for deferred payment option, then it should be required to settle balance deferred payment liability post deducting the surrender value of the spectrum.

Q.31 In case a TSP acquires spectrum through trading, should the period of 10 years to become eligible for surrender of spectrum, be counted from the date of original assignment of spectrum or from the date of acquisition through spectrum trading? Kindly justify your response.

RJIL Response:

We submit that in case of trading of spectrum the validity of the spectrum remains unaltered, thus, the 10 year lock-in should also remain unaltered. Therefore, the period of 10 years should be counted from the date of original assignment of spectrum. This will also ensure simpler valuation exercise for the spectrum to be surrendered. At best the present 2 years lock-in from the date of acquisition through

spectrum trading for further trading can be extended for surrender of spectrum in addition to this 10 year lock-in. Such lock-in will discourage the speculative behaviour.

Q.32 Whether provision for surrender of spectrum should also be made available for the existing spectrum holding of the TSPs? If yes, what should be the process and associated terms and conditions? Kindly justify your response.

RJIL Response:

1. We reiterate that in compliance to the Cabinet decision, the spectrum surrender under the new policy should be applicable for only the spectrum acquired post implementation of this policy as **any retrospective implementation would be tantamount to interference with auction conditions leading to vitiation of auction. Thus, in case a TSP wishes to surrender the spectrum acquired prior to cabinet decision, then it should be required to pay full dues.**
2. Thus, we strongly recommend that past spectrum should be kept out of the policy for surrender of spectrum so that the sanctity of past auction should be maintained.
3. This is even more important as the Government is desirous of reducing the litigation burden on the sector and any such misstep would open a Pandora box of new litigations. The prevailing policy implied that the any TSP desirous of exiting the sector had to explore the option of spectrum trading or merger and acquisition, this avenue of surrendering the spectrum was never open to such TSPs and we should not count out the legal challenges from such players.

Q.33 Whether spectrum surrender fee be charged from TSPs? If yes, what amount be levied as surrender fee? Kindly justify your response.

RJIL Response:

We submit that as the compensation for surrender of spectrum would be dependent on market value of the spectrum and would be always lower than the amount paid for the spectrum, there is no need of a deterrent surrender fee, however, the TSPs should be required to pay a processing fee of 1% of the balance spectrum value, as being done in case of spectrum trading.

Issues related to Valuation and Reserve price of Spectrum

Q.34 Which factors are relevant in the spectrum valuation exercise and in what manner should these factors be reflected in the valuation of spectrum? Please give your inputs with detailed reasoning.

RJIL Response:

1. We submit that relevant factors for spectrum valuation exercise consist of following
 - **Objective of the auction**
 - **National policies on utilization of the resource**
 - **Impact of proliferation on national economy**
 - **Revenue potential of the spectrum**
 - **Analysis of one time revenue against the long term gains through license fee**
 - **International benchmarking**
 - **Benchmarking against the paying capacity and ARPU**
 - **The cost of laying networks in various bands**
 - **The ARPU growth vs. increment investment**
 - **Opportunity cost of spectrum remaining unsold/unutilized due to high reserve price**
 - **Increased demand of delicensing due to setting high reserve price**
 - **Increased demand for administrative assignment due to setting high reserve price**
2. We have already explained these factors in detail in the preface and are not reproducing the same to avoid repetition.

Q.35 In what manner, should the extended tenure of spectrum allotment from the existing 20 years to 30 years be accounted for in the spectrum valuation exercise? Please support your response with detailed rationale/ inputs.

RJIL Response:

1. The extended tenure of spectrum under the Cabinet reforms **is one of the measures to infuse liquidity and encourage investment in the sector, therefore, it should be not be seen from the perspective of linear correlation with the spectrum valuation.**
2. The extension of the tenure should be strictly viewed from the perspective of long term sustainability of the TSPs and predictability of regulatory regime. Anyhow, the extended tenure would not imply higher bidding capacity with the TSPs at the current juncture. Further, in a fast changing technological landscape, where a technology like

3G became obsolete in 5 years with prime spectrum band for it needing somewhat inefficient redeployment, should also be borne in mind.

3. Thus, the extended tenure does not necessarily mean that spectrum will retain same value for next 10 years. **Thus, the spectrum tenure extension should not amount to additional valuation of spectrum. Any upward escalation of spectrum valuation on this ground will be tantamount to negating the Cabinet reforms at implementation level.**

Q.36 What could be the likely impact of the following auction related telecom reforms announced by the Government in September 2021 on the valuation of various spectrum bands?

(a) Rationalization of Bank Guarantees to securitize deferred annual spectrum payment instalments in future auctions

(b) No spectrum usage charges (SUC) for spectrum acquired in future auctions

(c) Removal of additional SUC of 0.5% for spectrum sharing

(d) Provision for surrender of spectrum

In what manner, should the above provisions be accounted for in the valuation of spectrum? Please support your response with detailed justification.

RJIL Response:

1. We submit that the policy measures taken by the government should not have any impact on the valuation of spectrum. In order to understand the correct import and perspective of telecom reforms by Union cabinet in September 2021, we are extracting and reproducing the relevant paragraphs from the press release as herein below.

“These are expected to protect and generate employment opportunities, promote healthy competition, protect interests of consumers, infuse liquidity, encourage investment and reduce regulatory burden on Telecom Service Providers (TSPs).

In the backdrop of the outstanding performance of the Telecom Sector in meeting COVID-19 challenges, with huge surge in data consumption, online education, work from home, interpersonal connect through social media, virtual meetings etc., the Reform measures will further boost the proliferation and penetration of broadband and telecom connectivity. The Cabinet decision reinforces the Prime Minister’s vision of a robust Telecom Sector. With competition and customer choice, antyodaya for inclusive development and bringing the marginalized areas into the mainstream and universal broadband access to connect the unconnected. The package is also expected to boost 4G proliferation, infuse liquidity and create an enabling environment for investment in 5G networks.”

2. Evidently, the Government has focused on reducing the regulatory burden and introducing ease of doing business with an objective to make the sector more robust financially and for it to be able to meet the national proliferation goals. Thus, any attempt to connect these reforms with higher valuation of spectrum would be equivalent to undoing the cabinet efforts by a backend machination.
3. Instead, the Authority should take a positive cue from the Government reforms and usher in spectrum valuation reforms by lowering the valuation in line with best international practices. It is reiterated that any effort to revise auction prices will completely undo the efforts made by the government to usher reforms.

Q.37 Whether the auction determined prices of March 2021 auction be taken as the value of spectrum in the respective band for the forthcoming auction in the individual LSA? Should the prices be indexed for the time gap (even if less than one year or just short of one year)? If yes, please indicate the basis/ rate at which the indexation should be done, with reasons.

And

Q.38 If the answer to the above question is in negative, whether the valuation for respective spectrum bands be estimated on the basis of the various valuation approaches/methodologies being followed by the Authority in the previous recommendations, including for those bands (in an LSA) for which either no bids were received, or spectrum was not offered for auction?

And

Q.39 Whether the method followed by the Authority in the Recommendations dated 01.08.2018 of considering auction determined prices of the auctions held in the previous two years be continued, or the prices revealed in spectrum auctions conducted earlier than two years may also be taken into account? Kindly justify your response.

RJIL Response:

1. We submit that **auction discovered prices are a relevant and important factor in a subsequent valuation exercise of already auctioned and sold spectrum bands, and we do not see any reason to change the same. However, unsold spectrum in an auction should also act as an important guiding point on how the valuation was wrong at certain places.** We submit that Authority should take a cue from large horde of unsold spectrum to introduce the valuation reforms.
2. Further, as per the time tested policy, indexation, if any, should only be contemplated if the valuation exercise is being done post 1 year of last auction. However, as this is not the case, there is no need for indexation.

3. **Furthermore, past auction prices are not a relevant consideration for new spectrum band and even for considering the auction determined prices for spectrum bands auctioned and sold earlier, for years priors to the auction, the Authority should also take into consideration all other relevant factors.** For instance, the spectrum availability at that time of auction and consequent competitive intensity, association with license renewal etc. would be very relevant factors for using the valuation of spectrum in prior auctions.

Q.40 Whether the valuation exercise be done every year in view of the Government's intention to have an annual calendar for auction of spectrum? Please support your response with detailed justification.

RJIL Response:

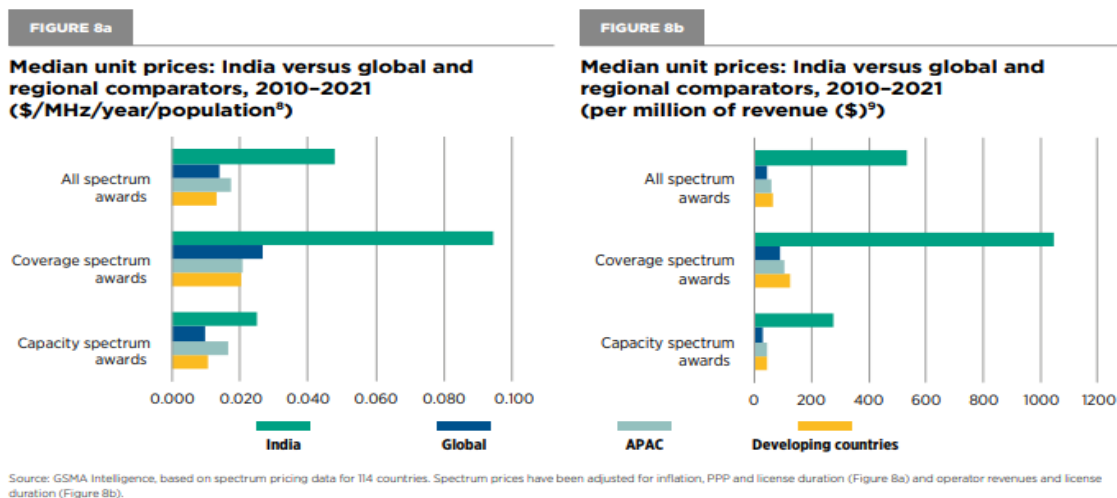
1. We submit once all available spectrum is put to auction and we have market determined price for all spectrum, then extensive annual valuation exercise may not remain relevant. However, the Authority may require re-evaluating the spectrum valuation in view of unsold spectrum in auction, technological changes, change in international benchmarks on spectrum valuation, new technologies and new spectrum bands being recognized as IMT bands and so on so forth.
2. Thus, the annual spectrum auctions will definitely require an annual re-look at valuation by the Authority, however, the extensiveness and comprehensiveness of this exercise can be curtailed by deciding certain fixed parameters like how much to discount the price in subsequent auctions on failure to find a buyer in auction.

Q.41 Whether there is a need to bring any change in the valuation approaches/methodologies followed by the Authority for spectrum valuation exercises in view of the changing dynamics in the telecom sector largely due to the usage of various spectrum bands by the TSPs in a technologically neutral manner? If yes, please provide suggestions along with a detailed justification about the methodology.

RJIL Response:

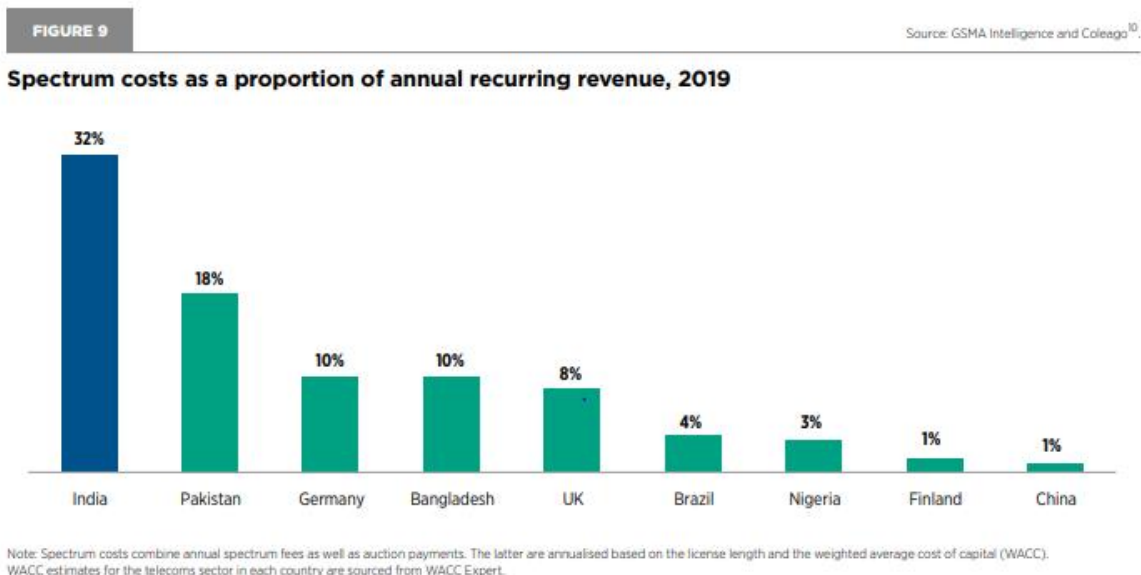
1. We submit that many of the spectrum valuation methodologies used by the Authority in past exercises remain relevant, however, these methodologies need to be updated and more importantly the outcome of these methodologies should be **rationalized with other relevant contingent factors like international benchmarking, the higher cost of building terrestrial networks with higher frequency bands, revenue growth potential and national proliferation goals, among others.**

2. It is worthwhile to note that the proliferation goals, cost of networks and intensive spectrum requirements under 5G and beyond technologies demand a paradigm shift in spectrum pricing policy and rationalization of reserve price. We submit that the spectrum valuation of new bands to be put to auction should not be solely based on past auctions prices and other band like 1800 MHz band, but should also consider the relative cost of laying a network with new spectrum, the additional number of BTS needed for comprehensive coverage; interference loss in the chosen band plan and above all the international benchmarks and best practices. In this context, it would be pertinent to bear in mind the GSMA analysis that spectrum awards in India have always exceeded the international benchmarks by multiples as shown below.



3. Further, the Authority should bear in mind that as we go for higher frequency, the coverage reduces and cost of installing network goes up considerably, thus to laden such spectrum with unrealistically high reserve price would invariably keep the newer technologies and faster data networks out of reach for consumers.

4. We reiterate that the phenomenon of unsold spectrum in India can easily be attributed to very high spectrum cost ratio to revenue as depicted by GSMA in above referred report.



- In this context, the current reserve price of almost Rs. 50,000 Crore for a 100 MHz slot in 3300-3670 MHz band seems highly unrealistic, especially when comparable western countries have auctioned same Spectrum at 1/70th of this price. **For India, this reserve price for mid-band spectrum should be brought down by 95% for a Pan India 100 MHz block and the reserve price of mmWave bands should be kept at 1/100th of mid band, while the same for V-Band and E-Band should be at 50% of mmWave band, considering low ARPU, purchasing Power in India and International benchmarks.**

Q.42 In your opinion, what could be the possible reasons for the relative lack of interest for the spectrum in the 2500 MHz band? Could this be attributed to technological reason(s) such as development of network/device ecosystem or availability of substitute spectrum bands or any other reasons(s)? Please support your response with detailed justification.

And

Q.44 Whether auction determined prices of October 2016 (i.e. for the auction held earlier than two years) be used as one possible valuation for the spectrum in 2500 MHz band for the current valuation exercise? If yes, should these prices be indexed for the time gap and at what rate? Please justify.

RJIL Response:

- We submit that in the **initial stages the device eco-system development in TDD Band 41 was slower in comparison with Band 40 leading spectrum in 2300 MHz band being preferred to 2500 MHz band.** This sluggishness in demand for this spectrum was further accentuated by the lackluster attempts in developing device eco-system by the TSPs holding this spectrum.

2. However, this spectrum remains equally important as the spectrum in 2300 MHz band for LTE and LTE-A, though its uptake would always be dependent on availability of spectrum in 2300 MHz. The TSPs are likely to continue prefer 2300 MHz first and go for 2500 MHz when 2300 MHz is in short supply, despite the current status of device ecosystem in this band being comparable to other LTE bands.
3. Another factor has been the spectrum in 1800 MHz emerging as one of prime LTE bands alongwith other erstwhile 2G bands in sub 1-GHz range leading to this spectrum falling behind, however, we understand that this band will remain useful for LTE and LTE-A.
4. Nevertheless, **owing to this band being technical similar to 2300 MHz band, we may disregard the market determined valuation in 2016 and instead consider the auction discovered price of spectrum in 2300 MHz band in 2021 without requiring indexation, as the value of spectrum in 2500 MHz band in current auction.**

Q.43 Whether the March 2021 auction determined prices be used as one possible valuation for the spectrum in 2300 MHz band for the current valuation exercise? If yes, should these prices be indexed for the time gap and at what rate? Please justify your response.

RJIL Response:

1. We submit that spectrum in this band has been much in demand in all 3 auctions so far i.e. in 2010, 2016 and even in the last auction in 2021, this was one of most sought after spectrum bands going by percentage of spectrum actually auctioned. Therefore, it can be sufficiently concluded that there is a demand for spectrum in this band, however, the fact that significant amount of spectrum was left unsold would also indicate that there is not much price elasticity in the band.
2. **In view of the same, there should not be unnecessary upward movement in the valuation of spectrum band and the Authority should persist with the last discovered auction price without indexing as the valuation is less than one year old.**

Q.45 Whether the value of the spectrum in 2300 MHz/ 2500 MHz bands should be derived by relating it to the value of spectrum in any other band by using technical efficiency factor? If yes, which band and what rate of efficiency factor should be used? If no, then which alternative method should be used for its valuation? Please justify your response with rationale and supporting studies, if any.

RJIL Response:

In view of our response to previous questions, we submit that there is no need of an extended revaluation of spectrum in these bands and auction discovered market price in 2300 MHz band can be used as valuation for both the bands for upcoming auction.

Q.46 In your opinion, what could be the possible reasons for the relative lack of interest for the spectrum in the 700 MHz band? Could this be attributed to technological reason(s) such as development of network/device ecosystem or availability of substitute spectrum bands or any other reasons(s)?

And

Q.47 Whether the value of spectrum in 700 MHz band be derived by relating it to the value of other spectrum bands by using a technical efficiency factor? If yes, with which spectrum band, should this band be related and what efficiency factor or formula should be used? Please justify your views with rationale and supporting studies, if any.

And

Q.48 If your response to the above question is in negative, what other valuation approach(es) be adopted for the valuation of 700 MHz spectrum band? Please support your response with detailed methodology.

RJIL Response:

1. We submit that the primary and possibly the only reason for zero uptake for this spectrum is over-valuation. **In previous valuation exercises for this spectrum, the Authority has been linking this spectrum with the valuation of spectrum in 1800 MHz which was probably not a fair comparison leading to overvaluation. This lead to the unsatisfactory outcome of spectrum remaining unsold.**
2. Therefore, it is imperative to revise the approach and delink the value from 1800 MHz band and instead link it to a band similar in propagation characteristics. We understand that sub 1Gz bands are technically quite similar. Even in the ZTE study referred by the Authority in its recommendation dated 1st August 2018, the technical parameters of 800 MHz band are much closer to 700 MHz band than 1800 MHz band. We are extracting and reproducing the relevant table as herein below:

Morph		Dense Urban	Urban	Suburban	Rural
Cell Edge User Throughput	kbps	512	256	128	64
700MHz					
UL Cell Range	km	0.70	1.21	3.37	8.48
Coverage Area	Km2	0.95	2.84	22.16	140.37
800MHz					
UL Cell Range	km	0.63	1.09	3.04	7.65
Coverage Area	Km2	0.78	2.33	18.06	114.22
1.8GHz					
UL Cell Range	km	0.38	0.64	1.67	4.40
Coverage Area	Km2	0.27	0.80	5.42	37.71
1.9GHz					
UL Cell Range	km	0.36	0.61	1.58	4.17
Coverage Area	Km2	0.25	0.72	4.87	33.84
2.1GHz					
UL Cell Range	km	0.32	0.55	1.43	3.77
Coverage Area	Km2	0.21	0.60	4.00	27.69
2.3GHz					
UL Cell Range	km	0.30	0.51	1.31	3.44
Coverage Area	Km2	0.17	0.50	3.35	23.08
2.6GHz					
UL Cell Range	km	0.27	0.45	1.16	3.04
Coverage Area	Km2	0.14	0.40	2.63	18.06

- It is apparent from the above table that the **valuation of spectrum in 800 MHz band is a better benchmark for valuation of spectrum in 700 MHz band, therefore, we request the Authority to use the market determined price of 800 MHz band in March 2021 auction as the value of spectrum in 700 MHz band.**

Q.49 Whether the valuation of the 3300-3670 MHz spectrum band should be derived from value of any other spectrum band by using technical efficiency factor? If yes, what rate of efficiency factor should be used? If no, which other method(s) should be used for its valuation? Please justify your response with rationale and supporting documents, if any.

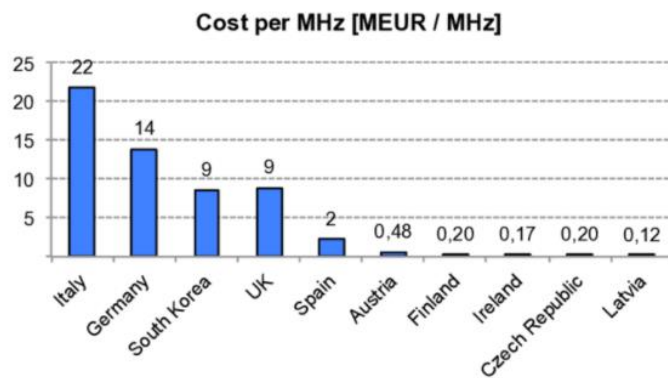
RJIL Response:

- This spectrum band is deemed as the prime band for 5G across the world with over 50 countries having already assigned this band for 5G and an equal number in process of doing so⁴. Similar traction is being seen in device ecosystem development in this band making it the anchor band for 5G services in a country. **Thus, it is important that the spectrum in this band is valued just right, so that there is sufficient uptake of this**

⁴ Source: GSA Report on national spectrum positions. <https://gsacom.com/paper/c-band-spectrum-december-2021-update/>

spectrum in order for a faster 5G roll-out and simultaneously a fair price is paid for this spectrum.

2. Evidently, the fact that this spectrum will be auctioned first time and is of critical import in meeting the national wireless broadband proliferation targets, all the factors discussed for optimum spectrum valuation will have a play in this valuation.
3. During the last such valuation exercise, the Authority had recommended that the reserve price of 3300-3600 MHz band should be equal 30% of the reserve price of the 1800 MHz FDD band. This methodology had pushed the reserve price for 100 MHz pan-India spectrum to about 50,000 Crore, which is way too excessive and is way higher than international benchmarks, with it being over 70 times the international prices and is about three times even the highest ever price in Europe⁵.



Cost per MHz in the 3400-3800 [Mhz] spectrum in different countries in the world. The Italian cost per MHz is the highest one.

4. The below comparison table already submitted by COAI to DoT also demonstrates the overvaluation of this spectrum.

Country	Auction determined price (in Cr/MHz)	Spectrum Price in India is X times the price in other countries	
		In Absolute Terms	Basis Spectrum Price/Population/GDP per capita
UK(recent auction 2021)	42.84	11.5	9.8
Australia	35	14	6
Spain	14	35	16
Austria	7	70	10
India^	492	1	1

TRAI determined reserve Price

5. Further, as per international experience and our internal analysis, C band will require 40% more sites than 1800 MHz to have a similar coverage, besides requiring 32T32R

⁵ https://www.researchgate.net/figure/Cost-per-MHz-in-the-3400-3800-Mhz-spectrum-in-different-countries-in-the-world-The_fig2_337151639

Massive MIMO to support MU-MIMO and beamforming. Power consumption and cost of Massive MIMO Radio Unit (MRU) is approximately 4 times than 1800 MHz band RU.

6. Further, due to high power consumption of MRU, it increases SMPS and battery back-up capacity. In addition, further capex will be added on power infrastructure and real estate space. Therefore, Capex and Opex for C-Band will increase at least by 5 times in comparison to similar cost for network for 1800 MHz band.
7. Clearly, the **30% valuation of spectrum in 1800 MHz will not be suitable for spectrum in this band. Another factor to be considered is revenue potential of this spectrum. For integrated data networks, this band will add capacity and help deliver much better data speeds but will not considerably alter the ARPUs, which may continue to grow at existing pace due to paying capacity of a majority of subscribers.**
8. Thus, the initial impact on the revenues will be not considerable and if the valuation of this spectrum is deemed excessive, some TSPs may give this spectrum a skip. Therefore, considering all these factors; cost of laying a network based on spectrum in 3300-3670 MHz band; the proliferation and societal goals from 5G, overall benefits to the economy as a result of such proliferation of 5G services, the valuation of this spectrum should be considerably reduced, and the **Authority should recommend a reserve price at around 95% of previous recommendations i.e. ~ 2500 Crore for a pan-India block of 100 MHz. We must not let this band become another 700 MHz band where excessive valuation has prevented the spectrum from serving the population for over 5 years now.**

Q.50 In case you are of the opinion that frequencies in the range 526-698 MHz should be put to auction in the forthcoming spectrum auction, whether the value of 526-698 MHz be derived by using technical efficiency factor? If yes, with which spectrum band, should this band be related and what efficiency factor or formula should be used? Please justify your suggestions.

And

Q.51 If your response to the above question is in negative, which other valuation approach(es) should be adopted for the valuation of these spectrum bands? Please support your suggestions with detailed methodology, related assumptions and any other relevant factors.

RJIL Response:

This band has similar characteristics to other sub-GHz bands and will be useful for deep and wide rural coverage and indoor penetration. The valuation of this band should be realistic and appropriate for a sub-GHz band. As there was a recent auction

price discovery for spectrum in 800 MHz, we submit that the valuation of all Sub GHz Spectrum i.e., spectrum in 700 MHz band and Spectrum in 526-698 MHz should be kept equal to the valuation of Spectrum in 800 MHz band.

Q.52 Whether the value of spectrum in 24.25 - 28.5 GHz band be derived by relating it to the value of other bands by using technical efficiency factor? If yes, with which spectrum band, should this band be related and what efficiency factor or formula should be used? Please justify your suggestions.

And

Q.53 If your response to the above question is in negative, which other valuation approaches should be adopted for the valuation of these spectrum bands? Please support your suggestions with detailed methodology, related assumptions and other relevant factors.

RJIL Response:

1. The mmWave band is quite unlike any of the bands auctioned so far in India and we may be required to go purely by international benchmarks for its valuation. This spectrum will be used majorly to provide high speed data capacities in dense locations and is unlikely to be used to provide uniform coverage owing to limited coverage by mmWave radio which is limited to 50-100 meters and requires lot many radios in a small cluster to provide hotspot coverage.
2. Further, the mmWave Radio cost is high because of: (1) High Frequency Front End (2) 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 current spectrum bands deployed in the country.
3. **Internationally, this band has 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.**

Country	C-band (\$/MHz/PoP)	C-band (Years)	mmWave (\$/MHz/PoP)	MmWave (Years)	mmWave/C-band (\$/MHz/PoP/Year) (in %)
USA	0.94 (3.7 GHz)	15	0.011 (28 GHz)	10	1.76%
USA	0.94 (3.7 GHz)	15	0.008 (24 GHz)	10	1.28%
USA	0.94 (3.7 GHz)	15	0.0071 (37/39/47 GHz)	10	1.13%
Taiwan	0.71 (3.5 GHz)	20	0.001 (28 GHz)	20	0.14%
Italy	0.41 (3.7 GHz)	19	0.002 (26 GHz)	19	0.49%
Singapore	0.07 (3.5 GHz)	15	0.0001 (26/28 GHz)	15	0.14%

4. Nevertheless, taking the US auction discovered price of mmWave as a benchmark, **despite of it being relatively higher due to a robust secondary market in spectrum trading, we can easily decipher that the valuation of this spectrum is around 1% of the spectrum in 3400-3670 MHz.**
5. **In view of the above, we submit that the Authority should keep the valuation of this spectrum at 1% of the same for spectrum in 3300-3670 MHz band.**

Q.54 Whether international benchmarking by comparing the auction determined price in countries where auctions have been concluded be used for arriving at the value of these new bands? If yes, then what methodology can be followed in this regard? Please explain.

And

Q.55 For international benchmarking, whether normalization techniques be used for arriving at the valuation of these new bands in the Indian context? If yes, please justify your response with rationale /literature, if any.

RJIL Response:

1. The Authority has aptly used the international benchmarking in the past when there was insufficient data on new spectrum bands to be auctioned and **we submit that this remains a very important parameter for determining the relative value of spectrum with respect to other IMT bands, especially when the band is being auctioned for the first time and not much data is available for other modes of valuation of spectrum.**
2. The normalization techniques may not be really relevant in case of new technology and new spectrum being put to auction. The parameters like average valuation, in case of multiple international auctions, may be relevant, but the important factors remain salability of a band and price elasticity in the market for optimum valuation through auction. The normalization techniques have kept the spectrum in 700 MHz out of reach of TSPs, whereas a more rational pricing like benchmarking with 800 MHz band might have seen this spectrum having much better uptake.
3. **The national proliferation goals and cost of laying network should also be juxtaposed against the revenue potential of a spectrum band to arrive at an optimum valuation.**

Q.56 Whether a common methodology/ approach should be used for valuation of all sub-1 GHz bands, which are currently planned for IMT? If yes, suggest which methodology/

approach should be used. Please give your views along with supporting reasoning and documents/ literature, if any.

RJIL Response:

The sub-1GHz bands are technically quite similar and 800 MHz band and 900 MHz bands have been auctioned many times in the past decade, therefore auction determined market value should be sufficient enough parameter for valuation of spectrum in this band.

Q.57 Whether the extrapolated ADP based on a time-series analysis, may be considered as the valuation itself or some normalization may be performed taking into account the financial, economic and other parameters pertaining to a particular auction? If yes, which factors should be considered and what methodology should be followed?

RJIL Response:

1. We submit that the auction determined prices (ADP) are a good and very relevant factor for the bands that have been already auctioned and sold, all other things remaining unchanged. **However, application of a linear relationship based time-series analysis may not be optimum in all scenarios and all other relevant factors need to be given due weightage.** For instance, in 1800 MHz band, the auctions in 2012, 2014, 2015 and 2016 had an issue of survival by continuation of license or license renewal.
2. Additionally, these auctions were conducted in a hyper competitive spectrum scarcity environment whereas the same pressures were not present in 2016 and 2021 auctions. Evidently, the linear time series analysis without due weightage to other external factors would not be an optimum assessment. Same is the case with 900 MHz auction in 2014 and 2015, whereas similar factors cannot be associated with 800 MHz auction in 2015, 2016 and 2021, thereby implying that the linear time-series based analysis may not be relevant in all cases.
3. Another point of concern with this methodology can be the relative fall in value of a spectrum band with passage of time. **For instance, spectrum in 2100 MHz in 2010 can easily assumed to be far more important than the same spectrum in 2021, thus this method is not optimum in itself** and all other relevant factors discussed in previous replies may also be considered for valuation of spectrum.

Q.58 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 justify your response.

And

Q.59 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, median etc. should be followed? Please justify your response

RJIL Response:

1. We submit that single valuation approach for a particular spectrum band can be taken as the appropriate value of that band if it gives the optimum result. For instance, the ADPs can be single valuation approach for spectrum in sub-1GHz bands and also for twin bands of 2300 MHz and 2500 MHz.
2. Similarly, international benchmarking can be the single valuation approach for spectrum in 3300-3670 MHz and 24.25 - 28.5 GHz bands.
3. Average valuation of multiple valuation methodologies can be too simplistic an approach if the valuations are widely disparate and/or one methodology appears to be apt from all aspects and should be avoided in such scenarios.

Q.60 Is there any valuation approach other than those discussed above or any international auction experience/ approach that could be used for arriving at the valuation of spectrum for 700 MHz/ 800 MHz/ 900 MHz/ 1800 MHz/ 2100 MHz/ 2300 MHz/ 2500 MHz/ 3300-3670 MHz/ 24.25 - 28.5 GHz/ 526 - 698 MHz bands? Please support your suggestions with a detailed methodology and related assumptions.

RJIL Response: None

Q.61 Should the reserve price be taken as 80% of the valuation of spectrum? If not, then what ratio should be adopted between the reserve price for the auction and the valuation of the spectrum in different spectrum bands and why?

And

Q.62 Whether the realized/ auction determined prices achieved in the March 2021 auction for various spectrum bands can be directly adopted as the reserve price in respective spectrum bands for the forthcoming auction? If yes, should these prices be indexed for the time gap since the auction held in March 2021 and at which rate the indexation should be done?

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 80% 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. There are past instances of reduction in reserve price leading to greater participation in spectrum as detailed below:**

1800 MHz Band Spectrum Pricing (In Rs. Cr. per MHz)						
LSA	2012 Auctions		2013 Auction		2014 Auctions	
	RP	WP	RP	WP	RP	WP
Delhi	554	n/a	388	n/a	219	364
Karnataka	264	n/a	185	n/a	155	155
Mumbai	543	n/a	380	n/a	207	272
Rajasthan	54	n/a	38	n/a	26	26

RP - Reserve Price; WP - Winning Price

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. 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.

Q.63 Should the method followed by DoT in the previous auction in respect of collecting bid amount from the successful bidder in case spectrum is not available in a part of the LSA be followed in the forthcoming auction? Please justify your response in detail.

RJIL Response: Yes, the same process can be continued unaltered.

Q.64 What percentage rate of upfront payment should be fixed in case of each spectrum band?

And

Q.65 What should be the applicable period of moratorium for deferred payment option?

And

Q.66 How many instalments should be fixed to recover the deferred payment?

And

Q.67 What rate of discount should be used while exercising pre-payment/deferred payment option, in order to ensure that the net present value of payment/ bid amount is protected?

(Please support your suggestions for Q64 to Q67 with proper justifications.)

RJIL Response:

1. We reiterate our submission to the Government and the Authority that in order to provide initial impetus to the emerging technologies and give sufficient time for laying the networks or additional layers in network and monetize the spectrum, there is a need to considerably relax the payment terms.
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 25 years by way of annual payments. **These annual payments should be charged with the reasonable interest rates of 4% as specified by RBI Repo rate, in place of current prohibitive interest rates of 9% to 10%.**
4. Further, the TSPs should be permitted pre-payment of deferred payment obligations and should be incentivized by waiving the interest charges on exercising this option.

Issues related to Spectrum for Private Cellular Networks

Q.68 To facilitate the TSPs to meet the demand for Private Cellular Networks, whether any change(s) in the licensing/policy framework, are required to be made. If yes, what changes are required to be made? Kindly justify your response.

RJIL Response:

1. We submit that the current **policy framework based on the pillars of Unified License authorization for provisioning communication services direct to the consumers, whether individuals or enterprises; and auction based allocation of spectrum is sufficient for meeting the demands of private networks.**
2. The TSPs have been meeting these demands for over 20 years and there is no doubt that they will continue to meet the requirements with the advent of newer technologies. **We submit that TSPs are more than capable for meeting all the customization requirements of enterprises with increased focus on M2M and Industrial 4.0 services. Indian telecom market is very competitive and TSPs will continue to meet the enterprise requirements at aggressive and competitive tariffs, under the current policy framework.**
3. However, the Authority and Government need to maintain their unwavering focus on ushering in further liberalizing and ease of doing business measures to enhance the sustainability of the sector. **One such critical reform, escaping Authority's attention time and again is the policy of spectrum leasing. The Authority should take up the NDCP-2018 goal of further liberalizing the regime for spectrum trading, sharing and recommend guidelines for spectrum leasing.**

Q.69 To meet the demand for spectrum in globally harmonized IMT bands for private captive networks, whether the TSPs should be permitted to give access spectrum on lease to an enterprise (for localized captive use), for a specific duration and geographic location? Kindly justify your response.

RJIL Response:

1. We submit that guidelines for spectrum leasing should be issued as a liberalizing and facilitating measure for TSPs, in line with NDCP-2018 irrespective of whether there is a demand for globally harmonized IMT bands. Such demands can always be met by auction of spectrum.
2. Nevertheless, **the spectrum leasing guidelines should also cover for the use case of one licensee leasing spectrum in smaller geographical units and locations and also for smaller durations. In addition to spectrum leasing on long term basis to other licensees, the guidelines should also address the possibility of intermittent or temporary requirement of much larger bandwidth by one licensee to meet some special events like sports etc.** Thus, we submit that spectrum leasing policy should be holistic and not be based on one use case of captive networks.

Q.70 In case spectrum leasing is permitted,

- i. Whether the enterprise be permitted to take spectrum on lease from more than one TSPs?
- ii. What mechanism may be prescribed to keep the Government informed about such spectrum leasing i.e., prior approval or prior intimation?
- iii. What timeline should be prescribed (in number of days) before the tentative date of leasing for submitting a joint request by the TSPs along with the enterprise, for approval/intimation from/to the Government?
- iv. Whether the spectrum leasing guidelines should prescribe duration of lease, charges for leasing, adherence of spectrum cap provisions, roll out obligations, compliance obligations. If yes, what terms and conditions should be prescribed?
- v. What other associated terms and conditions may be prescribed?
- vi. Any other suggestion relevant to leasing of spectrum may also be made in detail.
(Kindly justify your response)

RJIL Response:

1. We submit that as the access spectrum will be utilized only to building and serve wireless communication networks, as per the current licensing framework, **only Unified Licensees with appropriate authorization should be permitted to obtain spectrum on lease from TSPs.** However, in order to facilitate the enterprises, managed service providers and system aggregators in building their own captive communication networks, **a new authorization under Unified Licensee can be introduced. The licensees under this authorization should be permitted to obtain spectrum through auction or lease, as per their business case.**
2. **Further, once the Cabinet decision on AGR definition is implemented in letter and spirit and a simple telecom revenue specific AGR regime is in place, the enterprises can avail this authorization without any fear of AGR related consequences.**
3. As there will be no effective change in ownership of right to use spectrum under leasing and the primary licensee will remain responsible for spectrum related payments, the spectrum leasing regime should be prior intimation based, wherein the interested parties may be required to inform the Government only 45 days prior to effective date of leasing.
4. In the spirit of ease of doing business, the spectrum leasing regime should not be over-regulated by specifying the duration, charges etc. These finer business details should be left to mutually agreed commercial terms between parties.
5. The spectrum cap guidelines should remain in force for any arrangement with duration more than six months. However, for smaller duration arrangements, like event specific requirements, there is no need to impose spectrum cap.

6. As both parties will be UL holders, there is no need to prescribe any separate compliance requirements as both will be required to comply with their own license requirements. Similarly, the roll out obligations will reside with the primary TSP i.e. the lessor.

Q.71 Whether some spectrum should be earmarked for localized private captive networks in India? Kindly justify your response

RJIL Response:

1. The concept of **reserving or earmarking spectrum for localized private captive networks goes against ethos on non-discriminatory and equitable allocation of scarce natural resources while simultaneously protecting national and public interest.** The reservation would inevitably metamorphose into administrative allocation of spectrum on the legally untenable grounds of first come first serve. Evidently, reservation or earmarking spectrum for some specific allocation will remove the competition from the field and should be avoided at all cost.
2. We understand that a clamor is being created for this separate spectrum allocation and pricing regime for private captive network, in the garb of Private Network/Industry 4.0. However, **the Authority to see through the attempts of free assignment of valuable national resources for commercial purposes.** We reiterate that there should be no other mode for spectrum allocation but for a well publicized and transparent auction.
3. We are not against the captive use of spectrum or dedicated networks for industries; however, it is worthwhile to note that the Licensed service providers incur huge costs to procure right to use spectrum for providing services to all customers including enterprises/industries/factories. **TSPs are providing and remain capable of providing such networks/ configuration in their network using existing resources. Therefore, there is no justification in providing same spectrum for free or at lower rate without auction to provide similar services.**
4. Enterprise business contributes substantial revenue of TSPs and with 5G this contribution will increase further, therefore, any truncation in the addressable market of TSPs by such regime not only adversely affect viability of TSPs but also cause loss to the exchequer and vitiate the whole spectrum auction regime. Thus, we humbly submit that the Government should not reserve or de-license any spectrum which has been identified or likely to be identified for use of IMT/ commercial services for such Private Captive Networks.

5. We also reiterate our submissions in preface that GSMA has brought out the risks and downsides of allocating free spectrum for captive industrial use in its policy paper on 'Mobile Networks for Industry Verticals: Spectrum Best Practices' dated July 2021, and we request the Authority to keep important points highlighted in this paper also under consideration.
 - **Commercial mobile operators support the needs of a wide variety of vertical sectors and will have added capabilities with 5G**
 - **Spectrum leasing or, when carefully planned, other types of spectrum sharing can be viable options for supporting verticals who want to build private networks**
 - **Spectrum that is set-aside exclusively for verticals in core mobile bands risks being underused and can undermine fair spectrum awards**
 - **Spectrum that is set-aside for verticals in core mobile bands can also threaten the wider success of 5G – including slower rollouts, worse performance and reduced coverage**
 - **Policymakers should consider the coexistence challenges when different use cases need to be supported in the same mobile band**
6. **Notwithstanding the above, we submit that in case the industries or the interlocutors interested in providing the captive networks for specific industries feel they can do a better and more cost-efficient job then they can participate in the auction and establish captive networks using for spectrum acquired through auction under a suitable Unified License authorization.**
7. We reiterate that the Authority can also think of a new authorization for captive networks under Unified License regime with simplified AGR implications to facilitate setting up of captive networks. However, the spectrum allocation should be strictly based on auction and the captive network should be built only under Unified License.
8. We further submit that spectrum leasing can also be useful policy initiative that can facilitate smaller industries in setting up captive networks. The Unified license holders may be permitted to lease spectrum to other authorization holders on mutually agreed commercial terms. This will also be in line with National Digital Communications Policy – 2018 (NDCP-2018) goals of further liberalizing the spectrum leasing regime.

Q.72 In case it is decided to earmark some spectrum for localized private captive networks, whether some quantum of spectrum be earmarked (dedicatedly) from the spectrum frequencies earmarked for IMT services and/or spectrum frequencies earmarked for non-

IMT services on location-specific basis (which can coexist with cellular-based private captive networks on shared basis)? Kindly justify your response with reasons.

RJIL Response:

1. We submit that reserving the frequencies from those earmarked for IMT services would amount to **willful violation of Hon'ble Supreme Court judgement dated 2nd February 2012 in CWP 423 of 2010 unambiguously enunciating that right to use such spectrum can only be alienated by a well-publicized transparent auction. This was further reiterated in Special Reference no 1 of 2012 by Hon Supreme Court of India.**
2. Needless to mention that any deviation from the Hon'ble Supreme Court established policy will be prone to legal challenges, delaying the assignments and would be a regressive step for both TSPs and enterprises. Therefore, such a step should not be contemplated. Further, we do not subscribe to the possibility of a spectrum capable of being used in captive networks and not being IMT spectrum. We submit that such spectrum, if not identified so far, would be identified as IMT spectrum in near future with ever evolving technologies and newer use cases emerging by the day.
3. While discussing such requirements, **we should not lose focus of the fact that spectrum is a vital finite resource with high economic value. Thus, spectrum allocation in any spectrum band that can be used to deploy and provide communication services, irrespective of the entity desiring to use the spectrum or the technology deployed, or type of services offered, should be allocated only through a transparent and open auction process.** This policy will keep the spectrum as part of commercial networks, which will help in orderly growth of the sector by ensuring no revenue truncation for TSPs and simultaneously ensuring a fair value of the spectrum for the national exchequer. This will also ensure compliance with the principle of 'Same Service Same Rule' while also protecting national security and data privacy concerns.

Q.73 In case it is decided to earmark some quantum of spectrum for private captive networks, either on exclusive or shared basis, then

- a) **Spectrum under which band(s) (or frequency range) and quantum of spectrum be earmarked for Private Network in each band? Inputs may be provided considering both dedicated and shared spectrum (between geographically distinct users) scenarios.**
- b) **What should be the eligibility conditions for assignment of such spectrum to private entities?**
- c) **What should be the assignment methodology, tenure of assignment and its renewal, roll-out obligations?**

d) What should be the pricing mechanism for assignment of spectrum in the band(s) suggested for private entities for localized captive use and what factors should be considered for arriving at valuation of such spectrum?

e) What should be the block size and spectrum cap for different spectrum band(s) suggested in response to point (a) above.

f) What should be the broad framework for the process of

(i) filing application(s) by enterprise at single location, enterprise at multiple locations, Group of companies.

(ii) payment of spectrum charges,

(iii) assignment of frequencies,

(iv) monitoring of spectrum utilization,

(v) timeline for approvals,

(vi) Any other

g) Any other suggestion on the related issues may also be made with details.

(Kindly justify your response with reasons)

RJIL Response:

Not applicable in view of our previous response, where we have clearly mentioned that such an implementation will be legally untenable and would be a regressive step with acute financial impact on the whole sector.

Q.74 What steps need to be taken to facilitate identification, development and proliferation of India specific 5G use cases for different verticals for the benefit of the economy and citizens of the Country? Kindly provide detailed response with rationale.

RJIL Response:

1. We submit that predictable regulatory environment with reasonable and early availability of required spectrum will facilitate in further augmenting the growth of Indian 5G use cases and will also enable early roll out of 5G services in the country. Further, it is necessary to create a healthy, encouraging, cost effective and level playing field environment for faster proliferation of 5G services at affordable rates for the people with required resources following the principle of "Same Service Same Rule". As already submitted in preface, following steps are essential for the same:

2. **Immediate Auction:** Currently total 182 operators in 73 countries have already launched commercial 5G services⁶, while there are none in India. **Even with India's capacity of exceeding the international timelines for roll-out of a new technology, it appears that 5G Roll out will take around 6 to 8 months post spectrum assignments.** Therefore, in

⁶ GSA 5G Market Snapshot Report November 2021

case we wish to catch up with the world and target to see working 5G services in 2022, it is imperative that 5G spectrum in all the bands is auctioned simultaneously and assignment made by March 2022.

3. **Simultaneous Auction of all IMT bands:** The mobile networks, especially for **vast geography like India need to be planned for both coverage and capacity. While mid-band spectrum is deemed anchor coverage band for 5G, the mmWave band spectrum is critical for capacity essential for enhanced Mobile Broadband (eMBB) and Ultra-Reliable Low-Latency Communications (UR-LLC) services.** Therefore, it is essential that spectrum of 5G is simultaneously assigned in all bands so that the TSPs can plan and rollout the networks optimized for both capacity and coverage. This will **further strengthen the digital economy and deliver the holistic ICTs based societal and economic benefits to entire population.**
4. In this pursuit, we reiterate that all globally recognized 5G bands should be made available **for auction** starting with **C-Band (3.3 GHz to 4.2 GHz), 6 GHz band, mmWave (26 GHz (24.25 – 27.5 GHz), 28 GHz (27.5 – 29.5 GHz), 37 GHz bands and Sub-GHz (600MHz & 700MHz) bands alongwith spectrum in V-Band and E-Band.**
5. Further within the mmWave Spectrum, it is imperative that **full range of Spectrum i.e. n257 & n258 bands (24.25 GHz – 29.5 GHz) should be auctioned. As also mentioned in preface, WRC-19 has already identified 26 GHz band (n258) (i.e., 24.25 GHz – 27.5 GHz) as an IMT band on a global level. Spectrum in 28 GHz band (n257 band) (i.e., 26.5 GHz – 29.5 GHz) is allotted for IMT services in several nations. Currently, more than 160 operators in 44 countries have invested in 5G networks across the 24.25 GHz – 29.5 GHz spectrum. It may also be noted that the report of the 5G High Level Forum prepared by the Steering Committee in August 2018 has already considered 24.25 – 27.5 GHz and 27.5 – 29.5 GHz as part of Announce Tier for IMT services.**
6. **Allocation of backhaul spectrum: The availability of Access spectrum is only the first step and in order to provide quality services, availability of sufficient backhaul spectrum is also equally critical.** We regret to note that the policy stalemate on one of the **most critical resource for the proliferation of wireless networks i.e. Backhaul spectrum is hurting the sector, especially impacting new entrants like RJIL and this needs to be addressed using the auction based allocation principle for all backhaul spectrum including MWA, MWB, Spectrum in E&V bands that have important Integrated Access Backhaul use cases in place.**
7. **Use of street furniture in facilitating Installation of Towers and Small Cells-:** Equally significant for network proliferation to the backhaul spectrum is the ease of installing towers and Small Cells. The requirement of small cells and mobile towers will increase by

multifold in the 5G scenario and with the current disposition on approvals and permissions for such facilities, this is set to become a major bottleneck for 5G proliferation. **We request the Authority to recommend enabling and aggressive steps to facilitate installation of Towers and small cells and make available the street furniture and other suitable infrastructure for 5G services in a uniform manner across the country.** We would also request Authority to take steps to bring ease of permissions and approvals for setting up mobile infrastructure in the country through statutory provisions.

8. **Exemption of Small Cells from SACFA approval process.** Considering the sheer number of Small Cells under dense 5G deployment and the fact that these will be deployed majorly on street furniture, with minimal notice period on case to case basis, these need to be kept out of SACFA process.
9. **Fiberization and Right of Way:** As already recognized by the Government and Authority, fiberization and **Fixed Line Broadband ('FLB')** need to play significant role to meet the proliferation goals. However, the continued high RoW costs of laying FLB and ineffective implementation of **Right of Way Rules 2016 (ROW Rules 2016)** has become a show-stopper. We reiterate our submissions under the consultation paper on **"Roadmap to promote Broadband connectivity and enhanced Broadband Speed"** that the **Right of Way rules 2016 (ROW Rules)** should be enabled with enforceable provisions in the Act, the way it has been provided in the NHAI Act.
10. **No Reservation No Delicensing:** No spectrum should be reserved for private network or **Industry 4.0:** we reiterate that that the Authority should recommend not to reserve or de-license any spectrum which has been identified or likely to be identified for use of **IMT/ commercial services for Private Captive Networks** or otherwise to ensure financial viability of TSPs vis-a vis such players. This will also ensure following of **"Same Service Same Rule"** and no undue enrichment to any private entity.
11. **Flexible Use of Spectrum for 5G and Satellite Broadband:** There is no doubt that **Satellite services are going to co-exist, complement, and compete with terrestrial services both technically and commercially, however, the demands for administrative allocation by Satellite operators are not legally tenable.** Further, as **5G and Space based communication technologies are now being developed in same spectrum bands, these will compete for same spectrum.** Thus, the assignment of this spectrum, being scarce & **high commercial value resource,** can be done in the only legally tenable mode i.e. auction. This will also ensure the level playing field under 'Same Service Same Rule' regime and will ensure that as per Hon. Supreme Court order, the **spectrum that can be deployed to offer communication services to Indian citizens is allocated only through auction irrespective of the network deployed i.e., satellite or terrestrial communication networks.** Further, over the years we have successfully migrated to a technology agnostic spectrum model

and looking at the evolution of technology over next 30 years, it will not be prudent to link spectrum with any particular technology, either 5G or satellite. Therefore, we humbly submit that, the spectrum should be offered for mixed use or flexible use, whereby the successful bidder can deploy it for satellite network or terrestrial network as per its choice.

12. **Spectrum Reserve Price rationalization:** We reiterate that the **proliferation goals, innovative spectrum reforms and intensive spectrum requirements under 5G and beyond technologies demand a paradigm shift in spectrum pricing policy and rationalization of reserve price post benchmarking with International best practices.** As highlighted before, the current reserve price of almost Rs. 50,000 Crore for a 100 MHz slot in mid-bands seems highly unrealistic, especially **when comparable western countries have sold same Spectrum at 1/70th of this price.** For India, this reserve price for mid-band spectrum should be brought down by 95% for a Pan India 100 MHz block and the reserve price of mmWave bands should be kept at 1/100th of mid band, considering low ARPU, purchasing Power in India and International benchmarks.
13. **Intellectual Property Rights (IPR):** The Authority should take steps to ensure a conducive environment for development of Indian IPR, especially in technology sector, by facilitating the approval mechanisms. This will enable the country to lead the world in technology and would empower the telecom sector to enhance the national wealth by becoming exporter of technology and equipment.
14. **Rationalization of Emission Guidelines:** The current EMF emission norms are a legacy of 2G-3G era and need to be rationalized to new technology realities to ensure smooth transition smoothly to 5G that will help deliver all major value-propositions of 5G-NR technology for all Indians. Therefore, we request that Power Density requirements should be aligned with ICNIRP guidelines and EMF compliance in case of Active Antenna System should be taken into consideration. Further, there should be relaxation in EIRP at Base Station, similar to FCC policy of per MHz limit of 82 dBm for urban areas and 85 dBm for rural areas, to provide flexibility to operators⁷. In addition to this the approach for compliance assessment can be based on the calculation method with applied reduction factors for Active Antenna System and field measurement should be conducted only in case the power density requirements are not met using the calculation method.
15. **Streamlining Network Certification framework:** At present the telecom sector has to get almost all of its network nodes and user devices tested and certified under TEC's Mandatory Testing & Certification of Telecom Equipment (MTCTE) as well as under National Security Directive on Telecom (NSDT) for evaluation of Trusted Source and

⁷ <https://docs.fcc.gov/public/attachments/FCC-20-22A1.pdf>

Trusted Product. **The implementation of these testing mechanism needs to be balanced out without any adverse impact on the rollout and expansion of digital networks, most importantly for upcoming 5G services.** Considering this and the fact that this is a complex exercise that requires synergy and close coordination of all entities – NSCS, DoT, TEC, TSPs, OEMs, SIs, and others also to avoid unnecessary delays, the entire approval process need to be revisited to avoid any unnecessary delays. **In the meanwhile, the implementation of these programs to be deferred at least till March 2023.**

16. **Global Chipset shortage and impact on Telecom:** As per all available estimates, the global Chip-Set shortage is going to extend well beyond the first half of 2022 **and would continue to have a cascading effect on the mobile networks due to possible disruptions in 4G network equipment supply, cost of mobile devices and availability of SIM cards.** This will definitely affect the TSPs margins and costs. **Therefore, the Authority is requested to take this into consideration and take all possible steps to avoid any adverse impact on already struggling sector.**
17. **Reforms in Spectrum payment terms:** To provide initial impetus to the emerging technology, 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. Further, the deferred payment for auction discovered spectrum price, should be spread over the remaining 25 years by way of annual payments with simple interest charged at RBI Repo rate of 4%.
18. **Rationalizing Regulatory levies:** With current Government levies of more than 32% of the revenue, the TSPs continue to suffer under the massive burden of regulatory levies. **The current burden of License fee and Spectrum Usage Charges is not only disproportionately high but prohibitive for growth as well and needs rationalization. The license fee on the operators should be done away with completely or to be limited only to cover the licensing and regulatory cost, which will be less than 1% of the revenue.**
19. **USO Fund levy is the biggest contributor to License fee levy and, in current scenario of over Rs. 58,000 /- crores unutilized USO fund, continuing with this levy is excessive and anti-consumer. This part of the USO levy should be done away with till the available USO fund is not utilized and the License fee should be limited only to cover the licensing and regulatory cost, which will be less than 1% of the revenue.**
20. **Definition of AGR:** There is a need to revisit present definition of AGR and align it with the decision of the Cabinet dated 15th September 2021 in letter and spirit so that TSPs are not required to follow circuitous route to provide one stop solution to customers. It is

suggested that Gross Revenue (GR) and Adjusted Gross Revenue (AGR) be defined as follows:

Gross Revenue: The Gross Revenue (GR) shall mean the revenue actually received/ realizable /receivable (i.e. accrual basis) directly from the customer(s) on account of provision of Access services licensed under Section 4 of the Indian Telegraph Act, 1885. For the purpose of this computation, Gross Revenue shall mean the revenue accrued on account of afore-mentioned telecom services, duly reconciled with audited financials and also disclosed in the TSPs statement of Revenue and license fee for that quarter / period.

(Exclusions: Non-Telecom revenues including but not limited to income from interest, dividend (including gain on sale of mutual funds), Foreign Exchange Fluctuation (including mark to market accruals), Capital Gains on business combinations (e.g. Merger/Demerger, Slump Sale etc.), Capital Receipts, sale of fixed assets (including Intangibles) and securities, Rental income, insurance claims, reversal of expenses, like provisions and bad debts, scrap sale, notice pay recovery, sale of goods and services for which license under section 4 of ITA,1885 not required such as sale proceeds of handsets or any other terminal equipment., notional income including free Air Time, other comprehensive income as mandated under IND-AS (known as below the line etc.), reimbursement of expenses etc., Recovery from vendors on account of deficiency of service, Credits provided by opex. / capex. Vendors, Interest on direct tax / indirect tax refunds, Management Support Charges/ Manpower Cross-Charge etc. do not accrue out of Licensed Telecom Services provided to customers and hence shall not be included in Gross Revenue)

Adjusted Gross Revenue (AGR): For the purpose of arriving at the “Adjusted Gross Revenue (AGR)”, following shall be excluded from the Gross Revenue to arrive at the AGR:

- I. PSTN/PLMN/GMPCS related call charges (Access Charges) including signalling charges, Bandwidth charges, leased circuits, Port Charges, co-location charges, infrastructure charges, and various other charges paid / payable (i.e., accrual basis) to other eligible/entitled telecommunication service providers
- II. Receipts from Universal Service Obligation Fund
- III. Roaming revenues paid / to be paid (i.e. accrual basis) to other eligible/entitled telecommunication service providers; and
- IV. Goods and Service Tax on provision of service paid to the Government if gross revenue had included the component of Goods and Service Tax.