

21 December 2015

To,

**Shri Sanjeev Banzal**

**Advisor (Networks, Spectrum and Licensing),**

**Telecom Regulatory Authority of India**

**Mahanagar Doorsanchar Bhawan**

**Jawahar Lal Nehru Marg, New Delhi- 110002**

**Subject: Response to TRAI's Consultation paper on "Valuation and Reserve Price of Spectrum in 700, 800, 900, 1800, 2100, 2300 and 2500 MHz Bands"**

**Dear Sir,**

At the outset, we thank the Hon'ble Authority for starting this consultation exercise with an aim to provide the additional spectrum for improving the broadband penetration and Quality of services (QoS) in the country.

It is widely recognized that broadband communication networks are required to support economic growth of information-based economies.<sup>1</sup>Increase in spectrum assignments for broadband and other services will have a crucial role to play in delivering desired broadband outcomes.

The Hon'ble Authority has also recognized the importance broadband penetration in its recommendations on Broadband dated 17<sup>th</sup> April 2015 wherein it has stated that.

*"Delivering Broadband (BB) is one of the major declared public policy priorities of the Government. This is primarily because it is seen as instrumental to the furtherance of the public policy agenda of social and economic inclusion. What is more, there are spillover effects (positive externalities) arising from the expansion in coverage of BB; and, these can contribute significantly to raising India's rate of economic growth."*

The availability of broadband can enhance and expand the opportunities and capabilities for individuals & businesses as a result of being able to access the Internet and exchange large amounts of data. This then gives rise to a wide range of socio- economic benefits, including:

- ✓ Digital Literacy.
- ✓ Improved Productivity.
- ✓ Extended geographic reach of markets.
- ✓ Health and Medical Benefits to Rural areas
- ✓ Innovation
- ✓ Greater Employment Opportunities

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<sup>1</sup> ITU-UNESCO (2011). "Broadband: a platform for progress. A report by the Broadband Commission for Digital Development"; "The State of Broadband in 2012: Achieving Digital Inclusion for All", A Report by the Broadband Commission, September 2012; "Broadband Strategies Handbook", T Kelly and C Rossotto (eds), The World Bank, 2012.

The following key issues need to be resolved during the current spectrum auction process since they have a significant impact on the upcoming auction along with the issues raised in the consultation paper:

- A. Spectrum Road Map
- B. Spectrum Interference
- C. Spectrum Harmonization
- D. Pricing & Timing of auction in 700 MHz band
- E. **Increase in Overall spectrum cap**

**A. Spectrum Road Map:**

There is a need to lay down a clear roadmap for spectrum management, which should state the requirement and availability of the spectrum for each LSA as well as for the whole country. This roadmap should be made available publicly to ensure transparency. This will ensure that the TSPs lay out their Short/long term roadmap to connect rural areas as per their business case.

**B. Interference Free Spectrum:**

It is a reasonable expectation of the Industry that the spectrum being auctioned at any given point of time should be interference free so that operators are able to deploy network and provide interference-free service across the circles. However, the Industry has witnessed heavy interference in 2100 MHz band, the spectrum of which was allocated to various operators during 2010 auction.

**C. Harmonize spectrum in 1800 MHz band**

The spectrum in 1800 shall be harmonized at earliest as the same will generate additional spectrum and will also make the existing spectrum contiguous and will consequently, enable its efficient use. The spectrum becoming available consequent upon harmonization of 1800 MHz band should be put to auction considering its importance in deployment of mobile broadband networks.

**D. Pricing & Timing of auction in 700 MHz band:**

The spectrum in 700 MHz band due to its excellent propagation characteristics has been designated as digital dividend band and will play a crucial role in the expansion of broadband in the rural parts of the country. However, the development of the eco-system plays an important role in the adoption of any band, and they should be considered while deciding the timing of auction and the setting of reserve prices of any spectrum band.

Spectrum's greatest value comes from its usage rather than from the short-term revenues generated by its sale. Short-term revenue generation must be balanced with the subsequent infrastructure investments to be made by operators and their present financial position. Mobile operators in India have been faced with a high financial burden which, in turn, impact their ability to make the investment required to upgrade consumer services, meet demand in highly populated urban areas and expand networks to provide coverage to people living in rural areas. Moreover,

the mobile operators, earlier this year, have spent huge Capital expenditures (CAPEX) in procuring back their existing spectrum for extending their licenses on completion of 20 years; which makes it really difficult to have access to the funds to build infrastructure in an underdeveloped spectrum band.

We note from the analysis of cost information / data published by the Hon'ble Authority in its consultation on 'Valuation and Reserve Price of Spectrum' July, 2013, where it was observed that there was a loss/under recovery of cost by as much as Rs 15 per subscriber per month, which was 16% of the ARPU. An analysis statement is attached as Annexure -I. In view of this fact, we believe

that there should be a linkage between the reserve price of any band and financial performance of the Industry. It means that reserve price of any band should be estimated in the proportion of financial capabilities/Financial performance of the telecom service providers (TSPs).

A high reserve price would result in poor appetite from potential bidders and could lead to valuable spectrum remaining unsold and unused. It was observed in Australia that an unrealistically high reserve price resulted in one operator quitting before the auction and led to great portion of the 700MHz spectrum unsold. Any unused or under-utilized spectrum does not benefit society or consumers. Therefore, timing of auction of the spectrum in this band will be a very important role in its adoption.

In view of this, it is very critical that the Government and the Regulator have a re-look at the objectives of releasing the spectrum band like 700 MHz, which would be one of the cost-efficient bands to expand coverage of broadband services. Setting up of reserve prices at a reasonably low level would be the key to achieve Digital India objectives.

Therefore, we request the Hon'ble Authority to decide **timing of the auction while keeping in mind the development of both network and device ecosystem. The** reserve prices should be kept at a reasonably low level to achieve the target of 'Broadband for All'.

**E. Increase in Overall spectrum cap:**

Presently, there are 7-12 operators in each service area. The presence of a high number of TSPs has led to excessive fragmentation of the spectrum, and the Indian TSPs are holding abysmally low quantum of spectrum, approx. 27MHz on average, as compared to its international counterparts, e.g. {(EU allocation (92.6MHz), UK (82.2MHz), France (138.5MHz), Spain (100.6MHz) and US (96MHz)}. Recognizing this, TRAI has not only acknowledged the need for lesser TSPs in India, but also the need for promoting consolidation.

Such consolidation would be possible only if the present spectrum caps are relaxed without adversely affecting competition and minimum number of operators. Current spectrum cap of 25% is to prevent the number of operators going down below four. However, all four operators will never have equal spectrum holding. Therefore, a spectrum cap at 25% will not allow consolidation in Industry. Therefore, we believe that TRAI should consider increasing the present cap for spectrum holdings from 25% to 40%.

Thanking you,  
Yours sincerely

**For Broadband India Forum**

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**A detailed response to the issues raised in the consultation paper is presented below:**

**Q 1. Whether the entire spectrum available with DoT in the 800 MHz band be put for auction?  
Justify your answer.**

**&**

**Q 2. How can the spectrum in the 800 MHz band, which is not proposed to be auctioned due to non-availability of inter-operator guard band, be utilised?**

**Response:**

- We recommend that all assignable spectrum in 800 MHz should be put to auction.

**Q 3. What should be the block size in the 700 MHz band?**

**Response:**

- 700 MHz will be used for technologies such as LTE/ LTE-A which works in block sizes of 5, 10, 15 & 20 MHz. Therefore, it is proposed that **spectrum in 700 MHz band be auctioned in block size of five MHz (paired).**

**Q 4. Whether there is any requirement to change the provisions of the latest NIA with respect to block size and minimum quantum of spectrum that a new entrant/existing licenses/expiry licensee is required to bid for in 800, 900, 1800 and 2100 MHz bands. Please give justification for the same.**

**Response:**

- The block size and minimum quantum of the spectrum for 800,900, 1800 & 2100 MHz has worked appropriately in the last auction and should be continued with.

**Q 5. What should be the block size in the 2300 MHz and 2500 bands?**

**Response:**

- The block size should be same as 2010 NIA in respect of 2300 & 2500 MHz band, i.e. 20MHz.

**Q 6. Considering the fact that one more sub-1 GHz band (i.e. 700 MHz band) is being put to auction, is there a need to modify the provisions of spectrum cap within a band?**

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**Q 7. Is there any need to specify a separate spectrum cap exclusively for the spectrum in 700 MHz band?**

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**Q 8. Should a cap on the spectrum holding within all bands in sub-1 GHz frequencies be specified? And in such a case, should the existing provision of band specific cap (50% of total spectrum assigned in a band) be done away with?**

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**Q 9. Should 2300 MHz and 2500 MHz bands be treated as same band for the purpose of imposing intra-band Spectrum Cap? Please support your suggestions for Q6 to Q9 with proper justifications.**

**Response:**

**The purpose of intra-band spectrum cap is to avoid concentration of in any band with any operator. Replacement of intra band cap with sub 1 GHz cap would allow an operator to hold more than 50% or practically hold entire spectrum in a particular band, which is not a desirable output from competition perspective. Further, current intra-band cap of 50% has effectively served the interest of consumer, competition and the Industry and is future fit for any new spectrum band. Therefore, we submit that there is no need for any change required in existing intra band spectrum cap.**

A separate sub-1 GHz band cap and/ or considering 2300 MHz & 2500 MHz band as the same band for intra-band spectrum cap will have the following issues:

- **Separate sub-1 GHz Cap:**

- The proposal of a separate cap for Sub-1 GHz bands in a market of 7-13 operators will enable a single operator to acquire an excessive/disproportionate amount of the spectrum in a particular Sub-1 GHz band thereby creating its monopoly/dominance in a specific band.
- Importantly, while sub-1 GHz bands (700, 800 and 900 MHz band) are considered more efficient due to their better propagation characteristics, these spectrum bands are not directly substitutable due to distinct ecosystem. Therefore, any operator would require spectrum in every sub-GHz band for offering various services/technologies.
- This proposed format for defining the spectrum caps tantamount to changing the rules midway. During the last few spectrum auctions, when a substantial amount of the spectrum in 900 MHz and 800 MHz band was assigned, the operators were subjected to band specific cap rule. Had the new spectrum cap been implemented during the past spectrum auctions, the respective operators' spectrum cap for 900 MHz and 800 MHz would have been different, and they would have placed their bids accordingly.
- Currently, 800 MHz and 900 MHz are held by 3-4 operators due to intra-band cap, and no operator has any monopoly over these bands. On the contrary, the proposed Sub-1 GHz bands cap will allow one operator to acquire a disproportionate amount of spectrum in the 700 MHz or consolidate spectrum in the 800MHz band which at present is underutilized to a great extent, and will create its monopoly over that spectrum band/technology. This is a serious concern, especially in a market like India where the spectrum holding per operator is abysmally low as compared to other countries and only small quantity of the spectrum is offered in each auction/band.

We, therefore, strongly believe that the proposal of a separate spectrum cap of Sub-1 GHz band will only enable single operator and enable to grab excessive spectrum in a particular Sub-1 GHz

band, e.g. 800 MHz or 700 MHz band and will, therefore, defeat the very purpose of prescribing the intra-band spectrum cap.

- **2300 MHz and 2500 MHz bands be treated as the same band for imposing intra-band Spectrum Cap:**
  - These two bands also have a distinctly different network and device eco system and therefore, treating 2300 MHz and 2500 MHz bands as one band for the purposes of an intra-band cap may result in one operator acquiring a disproportionate amount of the spectrum in one of the bands viz. 2300 MHz/ 2500 MHz or consolidate spectrum in the 2300 MHz band, which will create one operator's monopoly over that particular spectrum band.
  - It may also be noted that although spectrum in 900 MHz and 1800 MHz are considered interchangeable historically and been used for offering same services/technology in overlapped network and are subjected to common rollout obligations, but these are still treated as different spectrum bands for the purposes of spectrum cap.

Therefore, we find no rationale for treating these two bands common for Intra-band spectrum cap.

We recommend that **the current intra-band cap of 50% be applied for both 700 MHz and 2500 MHz bands.**

**Q 10. Suggest an appropriate coverage obligation upon the successful bidders in 700 MHz band? Whether these obligations be imposed on some specific blocks of spectrum (as was done in Sweden and UK) or uniformly on all the spectrum blocks?**

**&**

**Q 11. Should it be mandated to cover the villages/rural areas first and then urban areas as part of roll-out obligations in the 700 MHz band?**

**Response:**

- A mentioned above, the network and device ecosystem in respect of APT 700 MHz band is still at a nascent phase and will require time to develop. Initially, the network and device costs are high for such bands and therefore, any mandate to deploy networks using 700 MHz band in rural and remote areas first will be a non-starter as the device costs will be a deterrent in its adoption.
- We, therefore, believe that a suitable period of time, say at least 5-7 years should be given in case of any rollout obligations being prescribed in this band.
- We submit that given the sub-optimal allocations in India compared to other countries, there should be no bar on using the spectrum in any part of the service area.
- If the rural only approach were to be adopted, it will also result in an anomaly insofar as the metros are concerned - as either this spectrum will not be auctioned in the metros, or it will be used in the metros for urban coverage, but the same will not be permissible in a circle.

- Furthermore, such an approach could amount to saying, a partial allocation of 700MHz, and therefore, the price obtained for 700MHz would then have to be pro-rated to the population in the rural areas, where its use is permissible.
- In view of the above, we believe that there should be no restriction on using 700MHz in any part of the service area.

**Q 12. In the auction held in March 2015, specific roll-out obligations were mandated for the successful bidders in 800 MHz, 900 MHz, 1800 MHz and 2100 MHz spectrum bands. Stakeholders are requested to suggest: (a) How the roll-out obligations be modified to enhance mobile coverage in the villages? Which of the approaches discussed in para 2.58 should be used? (b) Should there be any roll out obligation for the existing service providers who are already operating their services in these bands. Please support your answer with justification.**

**Response:**

- The rollout obligations shall be maintained as per latest NIA for March 2015 auction.

**Q 13. In the auction held in 2010, specific roll-out obligations were mandated for the successful bidders in 2300 MHz spectrum band. Same were made applicable to the licensee having spectrum in 2500 MHz band. Stakeholders are requested to suggest:**

- (a) Should the same roll-out obligations which were specified during the 2010 auctions for BWA spectrum be retained for the upcoming auctions in the 2300 MHz and 2500 MHz bands? Should both these bands be treated as same band for the purpose of roll-out obligations?**
- (b) In case existing service providers who are already operating their services in 2300 MHz band acquire additional block of spectrum in 2300 or 2500 MHz band, should there be any additional roll out obligation imposed on them?**

**Response:**

- The rollout obligations for 2300MHz and 2500MHz should be along the principles and approach followed for 2100 MHz in the March 2015 auction.

**Q 14. .Keeping sufficient guard band or synchronization of TDD networks using adjacent spectrum blocks are the two possible approaches for interference management. Considering that guard band between adjacent spectrum blocks in 2300 MHz band is only 2.5 MHz in a number of LSAs, should the network synchronization amongst TSPs be mandated or should it be left to the TSPs for the interference free operation in this band? Please support your suggestion with proper justifications.**

**Response:**

- The network synchronization among TSPs and same configuration is necessary for the



interference-free operation in this band. This may be done under the oversight of the Regulator.

**Q 15. In case, synchronization of the TDD networks is to be dealt by the regulator/licensor, what are the parameters that the regulator/licensor should specify? What methodology should be adopted to decide the values of the frame synchronization parameters?**

**Response:**

- Since, the spectrum in 2300 MHz and 2500 MHz is to be used largely for broadband applications/ data where asymmetric capacities are required with downlink data speeds greater than uplink data speeds, **TDD configuration of 3:1 & GPS based synchronization is best suited and should be enforced by the regulator/ licensor.**

**Q 16. If synchronization of the TDD networks is ensured, is there a need for any guard band at all? If no guard band is required, how best the spectrum left as inter-operator guard band be utilised?**

**Response:**

- If synchronization of LTE-TDD networks is implemented, there is no need for any guard band.

**Q 17. Whether the ISP category 'A' licensee should be permitted to acquire the spectrum in 2300 and 2500 MHz bands or the same eligibility criteria that has been made applicable for other bands viz. 800 MHz, 900 MHz, 1800 MHz and 2100 MHz band should be made applicable for 2300 MHz and 2500 MHz bands also?**

**Response:**

- The eligibility criteria shall be same as applied in the recent auctions, including the March 2015 auctions.

**Q 18. Stakeholder are requested to comment on (a) Whether the guidelines for liberalization of administratively allotted spectrum in 900 MHz band should be similar to what has been spelt out by the DoT for 800 and 1800 MHz band? In case of any disagreement, detailed justifications may be provided. (b) Should the liberalization of spectrum in 800, 900 and 1800 MHz be made mandatory?**

**Response:**

- Liberalization guidelines for 900 MHz band should be similar to liberalization guidelines for 800 MHz and 1800 MHz band.

**Q 19. Can the prices revealed in the March 2015 auction for 800/900/1800/2100 MHz spectrum be taken as the value of spectrum in the respective band for the forthcoming auction in the individual LSA? If yes, would it be appropriate to index it for the time gap (even if this is less**

than one year) between the auction held in March 2015 and the next round of auction and what rate should be adopted for indexation?

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**Q 20.** If the answer to Q.19 is negative, should the valuation for respective bands be estimated on the basis of various valuation approaches/methodologies adopted by the Authority (as given in Annexure 3.1) in its Recommendations issued since 2013 including those bands (in a LSA) for which no bids were received or spectrum was not offered for auction?

**Response:**

- Yes, we believe that the prices discovered in the last spectrum auction should be taken as valuation of the spectrum in 800 MHz, 900 MHz, 1800 MHz & 2100 MHz bands in respect of service areas wherein spectrum was sold. No indexation is required over, and above the price discovered in last auction as the prices have been discovered in March 2015 and are less than a year-old. However, we believe that there is a need to develop a system where reserve price for any band should be estimated based on financial performance / financial capabilities of the wireless Industry.
- In respect of service areas wherein spectrum remained unsold; the valuation may be considered as 50% of the reserve price therein, as was done in 2013.

**Q 21.** Should the value of 700 MHz spectrum be derived on the basis of the value of 1800 MHz spectrum using technical efficiency factor? If yes, what rate of efficiency factor should be used? Please support your views along with supporting documents/literature.

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**Q 22.** Should the valuation of 700 MHz spectrum be derived on the basis of other sub-GHz spectrum bands (i.e. 800 MHz/900 MHz)? If yes, what rate of efficiency factor should be used? Please support your views along with supporting documents/literature.

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**Q 23.** In the absence of financial or non-financial information on 700 MHz, no cost or revenue based valuation approach is possible. Therefore, please suggest any other valuation method/approach to value 700 MHz spectrum band along with detailed methodologies and related assumptions.

**Response:**

- As mentioned above, the terms of auction of the spectrum in this band, including valuation, reserve price, rollout obligations, etc. should take into account the network and device ecosystem matures for this band.
- Therefore, in case, the Authority takes a view that the auction of 700 MHz band be considered at present, the Reserve price should be set at a conservative level, to avoid the chances of a failed auction. Further, a realistic reserve price would be the key to achieve objectives of Digital India.

The value of 700 MHz band should not be more than 50% of the market discovered price of 800 MHz band, considering that the LTE ecosystem in APT 700 MHz is yet to be developed, and hence operators might be forced to keep this spectrum underutilized/unutilized for a considerable period of time.

Alternatively, value of 700 MHz band be linked to the valuation of the 2300MHz band, which is at a similar stage of development. Since 700 MHz has better propagation characteristics than 2300 MHz band, therefore, its value may be set at 2x of the 2300MHz band.

**Q 24. Should the value of May 2010 auction determined prices be used as one possible valuation for 2300 MHz spectrum in the next round of auction? If yes, then how? And, if not, then why not?**

**&**

**Q 25. Should the value of the 2300 MHz spectrum be derived on the basis of the value of any other spectrum band using the technical efficiency factor? If yes, please indicate the spectrum band and technical efficiency factor with 2300 MHz spectrum along with supporting documents.**

**Response:**

- The final price for 2300 MHz band in May 2010 may be used as its valuation. No further indexation is required over the market discovered price considering the fact that the ecosystem in this band is not yet fully developed even after 5 years as also acknowledged by the Authority.

**Q 26. Should the valuation of the 2500 MHz spectrum be equal to the valuation arrived at for the 2300 MHz spectrum? If no, then why not? Please support your comments with supporting documents/ literature.**

**Response:**

- Spectrum in both 2500 MHz band and 2300 MHz band is being auctioned as an unpaired spectrum. However, 2500MHz not only has a poorer propagation characteristic than 2300MHz but also has a less-developed network and device eco system.
- Considering this, it is reasonable to assume valuation of 2500 MHz at a 20-30% discount to the valuation of 2300MHz.

**Q 27. Is there any other method/approach than discussed above that could be used for arriving at the valuation of 700/800/900/1800/2100/2300/2500 MHz spectrum bands or any international auction experience/ approach that could be used for valuation of any of these bands? Please support your suggestions with detailed methodology and related assumptions.**

**Response:**

- No other valuation method is required as the market price deduced in last auction is the most appropriate approach to arrive at the valuations.

**Q 28. As was adopted by the Authority in September 2013 and subsequent Recommendations and adopting the same basic principle of equal-probability of occurrence of each valuation, should the average valuation of the spectrum band be taken as the simple mean of the valuations obtained from the different approaches/methods attempted for that spectrum band? If no, please suggest with justification that which single approach under each spectrum band, should be adopted to value that spectrum band.**

**Response:**

- We suggest that the price derived in last auction be used for valuation.

**Q 29. What should be the ratio adopted between the reserve price for the auction and the valuation of the spectrum in different spectrum bands and why?**  
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**Q 30. Should the realized prices in the recent March 2015 auction for 800/900/1800/2100 MHz spectrum bands be taken as the reserve price in respective spectrum bands for the forthcoming auction? If yes, would it be appropriate to index it for the time gap (even if less than one year) between the auction held in March 2015 and the forthcoming auction? If yes, then at which rate the indexation should be done?**

**Response:**

- The Authority has consistently adopted a ratio of **0.8** for arriving at the reserve price. We, therefore, recommend that reserve price should be fixed at 80% of the spectrum valuation.
- In service areas where the spectrum went unsold, the reserve price may be set at a 30% discount.

