



**GSA¹Response to the Telecom Regulatory Authority of
India's Consultation Paper on**

**Auction of Spectrum in 700 MHz, 800 MHz, 900 MHz, 1800 MHz, 2100 MHz,
2300 MHz, 2500 MHz, 3300-3400 MHz and 3400-3600 MHz bands**

¹*The GSA (Global mobile Suppliers Association) develops strategies and plans, and contributes studies and technical analysis to international, regional and individual country policy-makers and regulators to facilitate the timely availability of spectrum for use by mobile network operators. GSA has a focus group for spectrum topics for technical and regulatory matters of radio spectrum pertaining to the successful evolution of International Mobile Telecommunication (IMT) and associated radiocommunication systems and comprises a team made up of spectrum and regulatory affairs specialists from GSA Executive Member and GSA Member companies. The GSA Spectrum Group is participating in the study work leading up the World Radiocommunication Conference meeting in 2019 (WRC-19). In addition GSA reports regularly on global spectrum harmonisation efforts and developments including auctions, assignments, allocations, and re-farming activities.*

FOR THE ATTENTION OF:

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Summary

GSA welcomes the opportunity to provide comments on the Consultation Paper on “Auction of Spectrum in 700 MHz, 800 MHz, 900 MHz, 1800 MHz, 2100 MHz, 2300 MHz, 2500 MHz, 3300-3400 MHz and 3400-3600 MHz bands”, 28th August 2017, Mahanagar Doorsanchar Bhawan, Jawahar Lal Nehru Marg, New Delhi.

GSA appreciates the effort of TRAI to enable a timely deployment of additional spectrum in India..

GSA would like to provide the following views on the Questions 1) to 3).

If TRAI requires any clarification to our response, please do not hesitate to contact:

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CHAPTER-IV: ISSUES FOR CONSULTATION

Q.1 (a) In your opinion when should the next access spectrum auction be held?

(b) If the spectrum auction is held now, should the entire spectrum be put to auction or should it be done in phased manner i.e. auction for some of the bands be held now and for other bands later based on development of eco system etc?

Please give your response band wise and justify it.

GSAresponse:

700 MHz band (698-806 MHz)

The APT700 FDD band plan for the 700 MHz band (3GPP band 28) is adopted by most countries across Asia Pacific region and other regions of the world, which represents a major opportunity for near global spectrum harmonization for LTE, ensuring the greatest economies of scale for user devices, capacity for mobile broadband, and roaming. It is excellent for wide area coverage in regional and rural environments, and for in-building coverage.

The 700 MHz band is on focus for 4G/LTE introduction today and 5G in future with Europe and Asia. Over 50 countries and territories have allocated, committed to, or recommend APT700 FDD band plan for LTE system deployments. According to GSA statistics, until July 2017:

- 41 operators have launched commercial services using APT700 band 28, or services in compatible European bands (CEPT 700);
- there are 741 APT700 band 28 devices comprising phones, tablets, CPEs & MiFis announced by many suppliers across all price points;
- 10.3% of all LTE phones can operate on band 28.

GSA supports re-auction of the entire available spectrum (2x35 MHz) in the 700 MHz band. Auctioning of the 700 MHz band in India will fuel the eco-system development, which will benefit stakeholders and end users in India as well.

3300-3400 MHz and 3400-3600 MHz band

The 3300-3400 and 3400-3600 MHz bands are very important for delivering mobile broadband service, including new applications of 5G / IMT-2020, given the available wide contiguous bandwidth and the prorogation characteristics which are similar to many of the frequency bands used for 4G/LTE.

The 3400-3600 MHz band has been identified for IMT at WRC-07 and WRC-15 in almost all countries of the world. Many countries will release the 3400-3600 MHz band for 5G. In addition, they are also considering the 3300-3400 and other portions of frequency band in the 3600-4200 and 4400-5000 MHz bands for 5G deployment. For example: China's MIIT is considering 3300-3600 and 4800-5000 MHz bands for 5G; Japan's MIC plans to release maximum 500 MHz from 3600-4200 and 4400-4900 MHz bands for 5G by March 2019 (the 3400-3600 MHz is already released for mobile usage in Japan); Korea will release 3400-3700 MHz for mobile usage in 2018 or 2019; the European Union identified 3400-3800 MHz as one of priority bands for 5G.

The GSA supports the TRAI to put the proposed 3300-3400 and 3400-3600 MHz bands into the next access

spectrum auction. In addition, we would like to ask the TRAI to study additional possibilities for using parts of the frequency range 3600-5000 MHz for 5G/IMT-2020 in future, in order to meet spectrum demand of 5G/IMT-2020 in this frequency range. Further clarification is provided in our response to the Question 3.

Q.2 Do you agree that in the upcoming auction, block sizes and minimum quantity for bidding in 700 MHz, 800 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? Please justify your response.

Q.3 What should be optimal block sizes and minimum quantity for bidding in (a) 3300-3400 MHz and (b) 3400-3600 MHz bands, keeping in mind both the possibilities i.e. frequency arrangement could be FDD or TDD? Please justify your response.

GSAresponse:

The GSA is of the view that FDD should NOT be considered as an option of frequency arrangement for either the 3300-3400 or the 3400-3600 MHz band. There is no MNO in the world that has a plan to deploy LTE FDD on the 3GPP Band 22 (3400-3600 MHz). 3GPP is now working on the first version of radio specification for 5G, namely the Release 15 5G New Radio (NR); and it supports only TDD frequency arrangement for the 3300-3400 and 3400-3600 MHz bands.

In many countries, such as China, Japan, Korea and many European countries, it is expected that at least 100 MHz of spectrum per operator will be released for 5G from the 3.3-4.2 GHz and 4.4-5.0 GHz bands. The 5G NR specification being developed by 3GPP will support a maximum carrier bandwidth of 100 MHz in the frequency bands below 6 GHz.

Considering the mobile market development and future demand for 5G/IMT-2020 in India, we believe that the proposed 3300-3400 and 3400-3600 MHz bands will not be sufficient to meet the market demand for 5G/IMT-2020, especially for providing at least 100 MHz of spectrum per operator for all operators in the market. We would like to ask the TRAI to study additional possibilities for using parts of the frequency range 3600-5000 MHz for 5G/IMT-2020 in future.

Taking into account the trends of allocating at least 100 MHz spectrum per operator in many other countries preparing for 5G development, the GSA suggests to choose a block size or block sizes between 50 to 100 MHz for the auction of 3300-3400 MHz and 3400-3600 MHz frequency bands, in order accommodate 3 to 4 operators in these two bands.

Q.4 Do you think that the roll-out conditions for 700 MHz, 800 MHz, 900 MHz, 1800 MHz, 2100 MHz, 2300 MHz and 2500 MHz stipulated in the last auctions held in October 2016 are appropriate? If no, what changes

should be made in the roll out obligations for these bands?

Q.5 Should there be any rollout obligations in 3300-3400 MHz and 3400-3600 MHz bands? If yes, what should these be? Please justify your response.

Q.6 Is there a need to prescribe spectrum cap in bands 3300-3400 MHz and 3400-3600 MHz? What spectrum cap provisions should be kept for 3300-3400 MHz and 3400-3600 MHz spectrum bands? Should these bands be treated as same or separate bands for the purpose of calculation of spectrum cap?

Q.7 Whether the prices revealed of various spectrum bands in the October 2016 auction can 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 since the auction held in October 2016. If indexation is to be done then at what rate?

Q.8 If the answer to above question is negative then, whether as per the practice adopted by TRAI in the previous valuation exercise, the valuation for respective spectrum bands be estimated on the basis of various valuation approaches/methodologies (Referred in Annexure 3.3) including those bands (in a LSA) for which no bids were received or spectrum was not offered for auction?

Q.9 Whether the value of 700 MHz spectrum should be derived by relating it to value of other bands by using technical efficiency factor? If yes, with which spectrum band this band be related and what efficiency factor or formula should be used? Please justify your views with supporting documents.

Q.10 Else, what valuation approach should be adopted for the valuation of 700 MHz spectrum band? Please support your valuation approach with detailed methodology and related assumptions.

Q.11 Whether the value of October 2016 auction determined prices be used as one possible valuation for 2300 MHz spectrum for the current valuation exercise? If yes, would it be appropriate to index it for the time gap since the auction held in October 2016? Please justify your response with supporting documents/ report(s), if any.

Q.12 Whether the value of the 2300 MHz spectrum should be derived by relating it to the value of any other spectrum 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 documents.

Q.13 Whether the valuation of the 2500 MHz spectrum should be equal to value of similarly placed spectrum band? If no, then which alternative method should be used for its valuation? Please justify your response with rationale and supporting documents /report(s)/ detailed methodology, if any.

Q.14 Whether the valuation of the 3300-3400 MHz spectrum bands and 3400-3600 MHz spectrum bands 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, then which alternative method should be used for its valuation? Please justify your response with rationale and supporting documents.

Q.15 Is there any other valuation approach than discussed above or any international auction experience/ approach that could be used for arriving at the valuation of spectrum for 700/800/900/1800/2100/2300/2500/3300-3400/3400-3600 MHz bands? Please support your suggestions with detailed methodology and related assumptions.

Q.16 Whether value arrived at by using any single valuation approach for 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.

Q.17 In case your response to Q16 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, as adopted by the Authority since September 2013 recommendations? Please justify your response.

Q.18 Is it appropriate to recommend Reserve price as 80% of the value? If not, then 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?

Q.19 Whether the realized / auction determined prices achieved in the October 2016 auction for various spectrum bands can 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 since the auction held in October 2016? If yes, then at which rate the indexation should be done?