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**GSMA's Response to the TRAI Consultation Paper on "the Auction of Radio Frequency Spectrum in the Frequency Bands Identified for International Mobile Telecommunications (IMT)"**

Dear Mr. Trivedi,

The GSMA is pleased to submit its response to the Telecom Regulatory Authority of India's (TRAI's) Consultation Paper on *the Auction of Radio Frequency Spectrum in the Frequency Bands Identified for International Mobile Telecommunications (IMT)*.

We trust that this submission will assist TRAI in its deliberations and remain available for any further information or discussion the Authority may require.

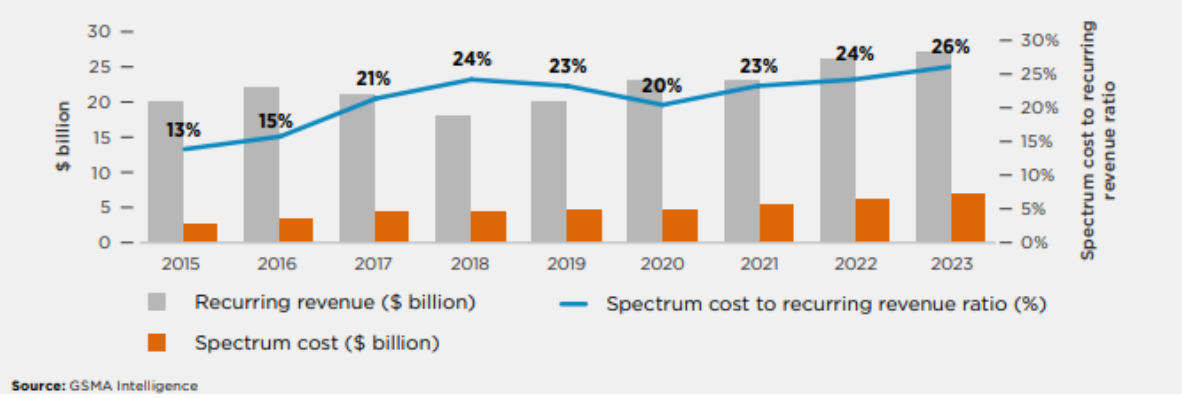
Yours sincerely,

Jeanette Whyte
Head of Public Policy, APAC
GSMA

## GSMA Response to the TRAI Consultation Paper on the Auction of Radio Frequency Spectrum in the Frequency Bands Identified for International Mobile Telecommunications (IMT)

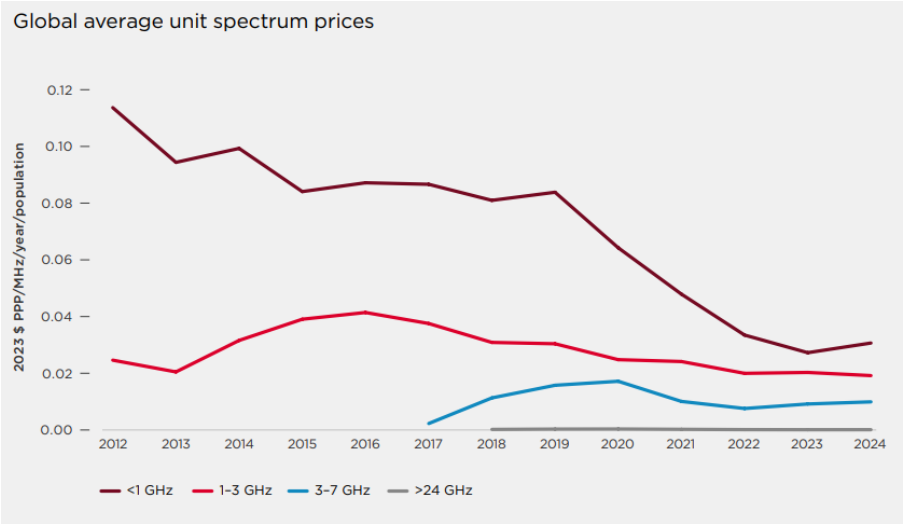
The GSMA welcomes TRAI's Consultation Paper and the opportunity to provide detailed input on the forthcoming auction of spectrum for International Mobile Telecommunications (IMT). Spectrum policy is central to India's ability to scale 5G, foster industrial digitalisation, and prepare for 5G-Advanced and 6G. The primary objective of spectrum assignment should be to unlock maximum socio-economic value by enabling affordable, high-quality mobile services widely across India, rather than to maximise short-term fiscal receipts. The success of any spectrum auction is measured by the subsequent investment in network infrastructure and the quality of services delivered to the citizens.

India has increasing demand for additional spectrum across frequency bands to meet exponential traffic growth, enable Fixed Wireless Access (FWA), enterprise private networks, and various use cases. At the same time, India's operators carry a historically high cumulative spectrum cost burden with one of the highest spectrum cost-to-revenue ratios globally (approximately 26% of operator recurring revenues, according to GSMA Intelligence[1] data).




This *Global Spectrum Pricing report* (May 2025) cautions against high reserve prices, showing that markets with elevated prices end up with unsold spectrum and face delays in network rollout and higher consumer costs. Therefore, to ensure meaningful uptake and timely deployment, we recommend that the reserve prices should be recalibrated to reflect operator's interest as well as the long-term global trends.

[1] https://www.gsma.com/connectivity-for-good/spectrum/gsma_resources/effective-spectrum-pricing/




- A forward-looking valuation and pricing approach, reflecting current market readiness and long-term policy objectives will allow enabling operators to invest effectively in both spectrum and infrastructure. Recent auction outcomes underline that high reserve prices, and massive 4G and 5G network investments, not “over-supply”, have been decisive barriers to efficient spectrum award.

GSMA’s submission therefore focuses on:

- ✓ **Forward-looking Reserve Prices (RPs) and Valuation:** Adopting a valuation approach that aligns with market reality and setting Reserve Prices to encourage full sale and incentivise investments.
- ✓ **Maximising Spectrum Supply:** Auctioning all available spectrum in established bands to provide necessary capacity for 5G/6G and prevent artificial scarcity. Manage competition through sustainable prices and choice of long-term validity of spectrum, rather than withholding supply.

Our question-wise response to TRAI consultation paper is as follows:

**Q1 What measures should be taken to enhance competition and mitigate over-supply of the spectrum in various frequency bands in the forthcoming auction? Please provide a detailed response with justifications.**

**GSMA Response**

- The fundamental measure to enhance competition and ensure the efficient assignment of spectrum is to correct the pricing mechanism. The notion of **"over-supply" is misplaced; the real challenge is pricing and affordability of spectrum**.

- The most critical measure is setting reserve prices so that true market price discovery can occur, rather than establishing prohibitive floors that deter bids. This is validated by the Department of Telecommunications' (DoT) own analysis[2], *"The diminishing returns of SMRA: A data driven Analysis of India's Spectrum Sales (2010-2024)."* The study conclusively demonstrates the failure of high reserve prices:
    - Of the spectrum offered between 2010 and 2024, only 32.7% was sold, leaving nearly ₹11.6 lakh crores unsold. This unsold spectrum represents the massive opportunity cost of prioritizing fiscal revenue over efficient allocation.
    - The study concludes that reserve price calibration is the decisive factor in restoring auction efficiency.
- To enhance competition while allowing operators to acquire necessary capacity, we request TRAI to make available spectrum in all harmonised IMT bands as per the market requirements. Withholding spectrum creates artificial scarcity, inflates prices, and reduces consumer welfare.

**Q2 Whether the entire available spectrum in the existing bands viz. 800 MHz, 900 MHz, 1800 MHz, 2100 MHz, 2300 MHz, 2500 MHz, 3300 MHz, and 26 GHz band should be put to auction in the forthcoming auction?**

a) **If yes, what measures should be taken to ensure effective competition in the forthcoming auction?**
b) **If no, what quantum of spectrum in each of the frequency bands should be put to auction in the forthcoming auction?**

**Kindly provide a detailed response with justifications.**

**GSMA Response:** As emphasised in response above, we recommend that the entire available spectrum in existing bands must be made available as per the market requirements. Restricting supply artificially inflates prices and is the primary driver of high spectrum costs.

**Q3.** ***Whether the band plans, which have been adopted for the existing bands viz. the 800 MHz, 900 MHz, 1800 MHz, 2100 MHz, 2300 MHz, 2500 MHz, 3300 MHz, and 26 GHz bands in India, should be retained in the forthcoming auction? If no, kindly suggest new band plan(s) for the existing bands with detailed justifications.***

**Q4.** ***Whether the spectrum in the existing bands viz. 800 MHz, 900 MHz, 1800 MHz, 2100 MHz, 2300 MHz, 2500 MHz, 3300 MHz, and 26 GHz bands should be auctioned on Telecom Circle/ Metro Area basis with a validity period of 20 years in the forthcoming***

[2] https://dot.gov.in/sites/default/files/smra_analysis.pdf?download=1

***auction? If no, what should be the area, and validity period of spectrum assignment in the existing bands? Please provide detailed response with justifications.***

**Q5.** ***Whether the block size and minimum quantity for bidding in the existing bands viz. 800 MHz, 900 MHz, 1800 MHz, 2100 MHz, 2300 MHz, 2500 MHz, 3300 MHz, and 26 GHz bands should be kept the same in the forthcoming auction as those in the spectrum auction of June 2024 as mentioned in Table No. 2.14 of this consultation paper? If not, what should be the band-wise block size and minimum bid quantity? Kindly provide a detailed response with justifications.***

**GSMA Response**

- **Consistency in Band Plans:** GSMA recommends retaining the existing band plans that India has adopted for the existing IMT bands. These plans align India with global device and network ecosystems (3GPP/ITU) and avoid the operational, interoperability and cost implications of deviating from standard configurations. Retaining existing band plans minimise refarming costs, accelerates time-to-deployment and leverages economies of scale for devices and network equipment.
- **Licence Validity:** GSMA supports auctioning these bands on the established Telecom Circle/Metro Area basis with retaining a 20-year validity to as baseline, while also providing MNOs the option to choose longer validity of 30/40 years. This long-term availability is essential for MNOs to justify and secure financing for the massive, multi-decade CAPEX investments required for network deployment and expansion, especially for 5G and future 6G infrastructure.
- **Block sizes:** Block sizes and minimum bid quantities should be chosen to enable both broad participation and the creation of meaningful contiguous spectrum assignments that support high throughput 5G services. The June 2024 auction block sizes were largely appropriate.

**Q8.** ***Whether there is a need to review the spectrum caps for the existing bands viz. 800 MHz, 900 MHz, 1800 MHz, 2100 MHz, 2300 MHz, 2500 MHz, 3300 MHz and 26 GHz bands for the forthcoming auction? If yes, what should be the spectrum cap per service provider for different frequency bands? Kindly provide a detailed response with justifications.***

**GSMA Response**

- Based on TRAI recommendations in past, DoT has been adopting spectrum caps which keep evolving from time to time. GSMA recommends continuing with the practice of spectrum caps on combination of bands having same/similar characteristics which also take care of the aggregation needs of 5G/6G networks.

- As regard the precise cap percentages we suggest that this should be calibrated to India's market structure and number of active operators.

**Q10.** ***Whether the spectrum in the 600 MHz band should be put to auction in the forthcoming auction? If yes, whether the band plan n105 should be adopted for the 600 MHz band, or otherwise? Please provide a detailed response with justifications.***

**Q11.** ***In case you are of the opinion that the 600 MHz band should not be put to auction in the forthcoming auction, what should be the timelines for auctioning of the 600 MHz band? Please provide a detailed response with justifications.***

**Q12.** ***In case it is decided to auction the spectrum in the 600 MHz band in the forthcoming auction,***

> ***(a) Should the entire available spectrum in the 600 MHz band be put for bidding in the forthcoming auction?***
> ***(b) Whether the eligibility criteria, associated eligibility conditions, block size, minimum bid quantity of spectrum, validity period for the assignment of spectrum, area of assignment on Telecom Circle/ Metro Area-basis, spectrum cap and roll out obligations for the spectrum in the 600 MHz band in the forthcoming auction should be kept the same as those in the spectrum auction of 2022, or otherwise? Please provide a detailed response with justifications.***

**Q13.** ***Are there any other inputs/ issues related to the auction of spectrum in the 600 MHz band for the forthcoming auction? Suggestions may be made with detailed justifications.***

**GSMA Response**

- The 600 MHz band is India's next nationwide coverage layer, enable deep rural reach and indoor penetration and broad socio-economic inclusion, fully aligned with India's 6G vision and universal connectivity goals. Therefore, GSMA recommends that the 600 MHz band can be released based upon market demand.
- Adopting the APT 600 MHz plan (3GPP n105), offering the full 2×40 MHz in large contiguous blocks is the most effective regulatory choice. This approach maximises spectral efficiency, accelerates rural coverage (where 600 MHz delivers the highest social value).

**Q14.** ***Whether the spectrum in 6425-6725 MHz and 7025-7125 MHz ranges in the upper 6 GHz band should be put to auction for IMT in the forthcoming auction? Kindly provide a detailed response with justifications.***

**Q15.** ***In case you are of the opinion that the spectrum in 6425-6725 MHz and 7025-7125 MHz ranges should not be put to auction in the forthcoming auction, what***

***should be the timelines for auctioning of this spectrum for IMT? Kindly provide a detailed response with justifications.***

**GSMA Response**

- GSMA recommends that TRAI plan to award the band to mobile operators in large contiguous blocks essential for urban capacity, low-latency industrial applications, and later on for 6G evolution, keeping in view India's population density and ever-increasing data requirements.

**Q16. Considering that the satellite-based service (uplink) will coexist with IMT-based services in the upper 6 GHz band, - whether pilot trials should be conducted to ascertain the keep-out distance of the IMT base stations for satellite uplink stations before the auction of the upper 6 GHz band, or should it be left to the telecom service providers to ascertain the keep-out distance of the IMT base stations for satellite uplink stations at the time of commercial deployment after the auction? Kindly provide a detailed response with justifications.**

**GSMA Response**

- GSMA supports a coordinated national framework for IMT based upon evidence from international studies which shows that coexistence is feasible through appropriate technical coordination zones or site-based protection, with base station deployment parameters adjusted where satellite earth stations exist.
- Therefore, GSMA recommends that DoT/TRAI prescribe clear coexistence rules, in advance of licensing of this band to avoid any uncertainty in future.

**Q17.** ***In case it is decided to put the spectrum in 6425-6725 MHz and 7025-7125 MHz ranges in the forthcoming auction, -***

***(a) Whether the 3GPP band plan n104 should be adopted for the upper 6 GHz band? If no, which band plan should be adopted for the upper 6 GHz band?***
***(b) What amount of spectrum in the 6425-6725 MHz and 7025-7125 MHz ranges should be put to auction?***
***(c) Whether the spectrum in the 6425-6725 MHz and 7025-7125 MHz ranges should be auctioned on Telecom Circle/ Metro service area basis with a validity period of 20 years? If no, what should be the area and validity period of spectrum assignment in the 6425-6725 MHz and 7025-7125 MHz ranges?***
***(d) What should be the block size, minimum bid quantity, and roll-out obligations for the spectrum in these ranges?***
***(e) What should be the eligibility criteria and associated eligibility conditions for bidding for the spectrum in these ranges?***

***Please provide a detailed response with justifications.***

**GSMA Response**

- As recommended above, GSMA recommends that the band should be made available in large contiguous bandwidth/channels to the mobile operators, essential for urban capacity, low-latency industrial applications, and later on for 6G evolution.
- Existing practice of Telecom Circle/Metro Area basis with existing 20-year spectrum validity as the baseline can be adopted, while providing MNOs the option to avail longer validity such as 30/40 years.
- There should not be any binding Roll-out obligations as the implementation is expected to be at targeted urban hotspots, enterprise zones and FWA deployments rather than nationwide coverage.

**Q19.** ***To mitigate inter-operator interference due to TDD-based configuration, whether the approach adopted for the 3300 MHz and 26 GHz bands should also be made applicable for the newly identified spectrum in the upper 6 GHz band? In case you are of the opinion that some other provisions are required to be established, suggestions may kindly be made with detailed justifications.***

**GSMA Response**

- GSMA supports adopting a TDD synchronization approach consistent with that used in the 3.5 GHz and 26 GHz bands to minimize inter-operator interference. National-level alignment of UL/DL frame configurations will ensure spectral efficiency, reduce interference zones, and improve Quality of Service (QoS).

**Q20.** ***Are there any other inputs/ issues related to the auction of spectrum in the upper 6 GHz band for the forthcoming auction? Suggestions may be made with detailed justifications.***

**GSMA Response**

- GSMA would like to highlight the importance of a clear and forward-looking national spectrum roadmap or national spectrum strategy that aligns the 6 GHz release with India's 6G strategy, encourages early device ecosystem engagement, and ensures that reserve price reflects nascent ecosystem and avoid premature cost burdens that could deter investment.
- The GSMA–Coleago global socio-economic study[3] indicates that releasing the band is critical for the future of IMT, as it is the single largest contiguous mid-band spectrum block available. This release is necessary to achieve the 2 GHz mid-band spectrum target needed to meet IMT-2020 requirements by 2030 and could generate

[3] https://www.gsma.com/connectivity-for-good/spectrum/wp-content/uploads/2024/12/Mid-band-5G-Spectrum-Benefits.pdf

up to USD 610 billion in additional global GDP. Full-power licensed IMT enables wide contiguous channels of 200–400 MHz, which can deliver up to 7x more economic benefits[4] as compared to unlicensed/shared-use models.

- Accordingly, TRAI should avoid assignment frameworks that dilute IMT performance—such as mixed-mode sharing—and instead prioritise fully licensed IMT assignment with defined coexistence parameters for satellite services. This approach ensures long-term spectral efficiency, predictable investment conditions, while maximising India's economic dividend.

**Q21.** ***Considering the need to assign a contiguous 24 MHz block in the 1427-1518 MHz range to the Government user:-***

***(a) Which band plan and duplexing scheme should be adopted for IMT in the 1427-1518 MHz range?***
***(b) Which range of spectrum (a contiguous block of 24 MHz) should be assigned to the Government user?***

***Kindly provide a detailed response with justifications.***

**Q22.** ***Are there any other inputs/ issues related to the spectrum in the 1427-1518 MHz range? Suggestions may be made with detailed justifications.***

**GSMA Response**

- GSMA is concerned about carving the 1427–1518 MHz band for non-IMT purposes which would be detrimental to spectral efficiency and should be avoided. Therefore, GSMA would like to request the TRAI that the entire IMT-identified 1427–1518 MHz band should, in principle, be made available for mobile services to enable efficient contiguous allocations.

- Setting aside spectrum for specific users (like government or private networks) in IMT bands leads scarcity and fragmentation of spectrum which ultimately leads to inflating the price of remaining spectrum in the band for mobile operators. This fragmentation also necessitates the use of inefficient technical solutions like wider guard bands and complex carrier aggregation, which reduce usable spectrum and, in turn, decrease network efficiency. Therefore, the entire IMT-identified 1500 MHz band must be assigned via open, non-discriminatory, market-based processes for wide-area mobile services to ensure maximum efficiency, optimal public benefit, and adherence to international harmonisation.

[4] https://www.gsma.com/connectivity-for-good/spectrum/wp-content/uploads/2024/09/GSMA_Mobile-Evolution-in-6-GHz.pdf

**Q23 Onwards: Auction Method, Spectrum Valuation, Reserve Price, and Pricing Methodology**

**GSMA Response**

The core issue underlying all questions on spectrum valuation, reserve price (RP) determination, and pricing for both existing and new bands is the establishment of a methodology that aligns with India's long-term digital economy goals and the overarching principle of maximising socio-economic benefits for the nation, rather than focusing on short-term fiscal revenue generation.

- **Flaws in the Indexation Approach:** The current method of reserve price determination, particularly the reliance on the price-discovered-in-previous-auction-duly-indexed method and the policy of valuation review every three years, must be discontinued as it is not always aligned with market dynamics:
    - Indexing to a historical price, even every three years, fails to account for the declining real value per MHz. While data usage has grown exponentially, the revenue per GB has plummeted (a 96% fall over the last decade globally[5]). The value of the resource to the operator, relative to their revenue, is decreasing, yet the indexed price keeps it artificially high.
    - The indexed RP acts as a price ceiling, rather than a floor. The DoT's own academic paper, *The diminishing returns of SMRA*, confirms this, noting the Winning Price to Reserve Price (WP/RP) ratio has declined to near 1.0. This means the RP is essentially the final selling price, and the auction fails to perform its primary function of price discovery.
    - A historically high, indexed RP contributes directly to India's cumulative spectrum cost burden, which is approximately 26% of operator recurring revenues[6], severely limiting the CAPEX available for essential 5G/6G network expansion and quality improvements.
- **DoT's Academic Paper:** We request that TRAI give cognizance to the findings of the DoT's own academic paper: The diminishing returns of SMRA: A data driven Analysis of India's Spectrum Sales (2010-2024)[7] which highlights the relationship between reserve prices, spectrum sold/unsold and overall auction efficiency.

[5] GSMA Global Spectrum Pricing
[6] GSMA Global Spectrum Pricing
[7] https://dot.gov.in/sites/default/files/smra_analysis.pdf?download=1

- **Policy Recommendations for Reserve Price and Valuation:** To align spectrum policy with national socio-economic objectives, we recommend the following reforms, consistent with the DoT paper and international best practice:

  ✓ **Rational Reserve Price Setting:** The RP must be set optimally and substantially below the estimated market price. The RP's function should be purely administrative—to discourage frivolous bidding—not to maximize government revenue. This mitigates the risk of unsold spectrum and allows market competition to determine the true efficient price.

  ✓ **Market-Based Valuation:** TRAI should adopt a forward-looking valuation methodology that includes market revenue normalisation. This benchmarks spectrum value against the economic capacity of the local market and the actual revenue derived from mobile services, providing a rational basis for determining a fair floor price, as successfully used in various other jurisdictions[8].

  ✓ **Prioritise Socio-Economic Value:** Decisions on valuation and reserve price must be guided by the principle that the highest value of spectrum is realised through its efficient use and timely deployment, leading to improved coverage and quality of service for the citizens, rather than through short-term fiscal revenue generation.

[8] https://www.gsma.com/connectivity-for-good/spectrum/gsma_resources/effective-spectrum-pricing/