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Subject: COAI's response on TRAI's Consultation Paper on "Terms and Conditions for the Assignment of Spectrum for Certain Satellite-Based Commercial Communication Services"

Dear Sir,

This is with reference to the Consultation Paper issued by TRAI on "Terms and Conditions for the Assignment of Spectrum for Certain Satellite-Based Commercial Communication Services", issued on September 27, 2024.

In this regard, please find enclosed COAI's response to the aforementioned Consultation Paper.

We trust our above submission would merit your kind consideration and look forward to your valued support on the same.

Thanking you in anticipation,

Sincere regards,

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COAI's Comments on TRAI's Consultation Paper on "Terms and Conditions for the Assignment of Spectrum for Certain Satellite-Based Commercial Communication Services" dated 27th September 2024.

We thank the Authority for providing us with the opportunity to share the comments to the consultation paper on Assignment of Spectrum for Certain Satellite-Based Commercial Communication Services.

1. Preface

- a. The assignment of spectrum to satellite services is a critical topic, especially given the rapid advancements in the satellite communication (SatCom) sector and its increasing convergence with various communication services.
- b. In its reference letter to TRAI, the Department of Telecommunications (DoT) specifically requested recommendations on the terms and conditions of spectrum assignment, including pricing, while ensuring a level playing field with terrestrial access services. This critical aspect, especially in terms of competition with terrestrial services, needs to be at the core of spectrum pricing policies. The current consultation paper does not adequately address the critical issue of ensuring a level playing field between satellite and terrestrial spectrum assignments, especially where satellite operators serve individual retail customers. Given that satellite operators are increasingly competing with terrestrial networks in providing similar services, this omission is significant and needs to be accounted for while examining the terms and conditions for assignment of spectrum which should include but not limited to, assignment methodology, pricing, validity, exclusive/ non-exclusive assignment, geographic area, licensing/regulatory norms etc..
- c. While the SatCom sector in India can be considered to be in nascent stages, it essentially has two aspects to it. The first is coverage and connectivity for some 20-25% of geographical part of India that is remote and difficult to connect due to terrain, where SatCOM is invaluable and may well play a public welfare role.
- d. The second aspect is comparable connectivity services to urban and dense urban areas already well connected by terrestrial networks where it is deemed to equally or better placed to offer connectivity services with rapid technological advancements continually shaping its potential. As satellite-based services, particularly Non-Geostationary Satellite Orbit (NGSO) constellations, evolve, they increasingly overlap with the services provided by terrestrial networks. This convergence raises important questions about spectrum assignment, pricing, and regulatory policies that need to be addressed to ensure a level playing field between satellite and terrestrial operators.
- e. COAI, representing terrestrial IMT operators in India, strongly emphasizes the need for maintaining a level playing field especially in offering commercial services in urban areas, when it comes to the assignment of spectrum resources. Given the significant investments terrestrial operators have made in acquiring spectrum, amounting to over ₹5.5 lakh crore, it is crucial that any spectrum policy for satellite communications ensures fairness, transparency, and competition. This is especially relevant as NGSO constellations now offer satellite based mobile and fixed wireless services directly to retail and enterprises, bringing them into direct competition with terrestrial operators.



2. Addressing India's Connectivity Gaps: The Role of SatCom

- a. As mentioned above, Satellite play a significant role in providing connectivity to unconnected regions, primarily in hilly terrains, remote rural areas, protected forest zones, and along certain parts of the coastline. Terrestrial networks, despite massive investments, may face limitations in reaching these areas. SatCom has the potential to bridge this digital divide, complementing terrestrial services to connect these underserved regions.
- b. SatCom, particularly in rural and remote areas, plays a crucial role in supporting government functions, disaster recovery, cellular backhaul and long distance point to point links. It is also vital for sectors like defence, maritime, and aviation. In these cases, SatCom is largely seen as a complementary service to terrestrial networks, focusing on non-retail customers.
- c. For satellite services catering to traditional markets such as rural and remote areas, defence, and disaster recovery administrative pricing, nominal spectrum charges, may be appropriate to drive SatCom adoption where it is most needed. This approach would ensure that satellite services continue to complement terrestrial networks in bridging the connectivity gap, while also fostering the growth of critical infrastructure in underserved areas. However, in view of the level playing field considerations this cannot be all encompassing policy, as is appears to be coming out from the questions framed in Consultation Paper.

3. NGSO Constellations and Growing Competition with Terrestrial Networks

- a. Advancements in NGSO constellations, such as those from SpaceX's Starlink and Amazon's Kuiper, have enabled satellite operators to offer speeds comparable to terrestrial networks. This development, coupled with satellite services being offered directly to retail customers, indicates that SatCom is no longer confined to its traditional role of serving rural and remote areas. Instead, it is now competing with services provided by terrestrial networks for retail and enterprises users across India.
- b. This shift has significant implications for spectrum assignment and pricing. The competitive presence of SatCom in urban areas, offering broadband, internet, and voice services directly to consumers and enterprises, requires the TRAI to ensure level playing field and ensure fairness and competition.
- c. Given the massive capacities that satellite constellations like Starlink and Amazon's Kuiper are bringing to the market, it is evident that they will become strong competitors to terrestrial operators especially in urban as well as semi-urban areas incl. Retail and Enterprise customer segments. The scale of data traffic they can support is comparable or even exceeds that of some terrestrial networks. Therefore, it is crucial to ensure a level playing field between satellite and terrestrial operators, particularly when it comes to spectrum pricing and regulatory frameworks. Terrestrial operators, having invested heavily in spectrum, are willing to face competition from satellite operators providing competing services in the same urban and semi-urban markets, however, the competition should be fair and on level playing field related to spectrum, licensing and regulatory norms. Spectrum being one of the major costs for the terrestrial networks. The sunk spectrum investments



by terrestrial operators must be protected in any spectrum pricing policy to ensure that competition between satellite and terrestrial services is fair, particularly in urban areas where satellite operators are now entering.

- d. Without fair and consistent pricing models and rules for both satellite and terrestrial operators, the competitive balance could be skewed, and tilt towards satellite players, potentially undermining years of investment made by terrestrial networks. To foster healthy competition and innovation while ensuring sustainable growth for all service providers, the government must implement policies that treat similar services equitably, whether delivered via satellite or terrestrial networks when they compete for the same retail and enterprise customers across India.

4. Technological Evolution and the Need for Flexible Policies

- a. The convergence of satellite and terrestrial networks is being driven by rapid advancements in technology. NGSO constellations now offer low-latency, high-speed broadband services, and the integration of satellite systems into 5G networks, through 3GPP standards, is further blurring the lines between these two types of networks. Direct-to-Device (D2D) services, where satellite operators provide services directly to mobile phones and other consumer devices, are another example of this convergence.
- b. SpaceX in its filing dated 11.10.2024 has requested approval from the U.S. Federal Communications Commission (FCC) to modify its Gen2 satellite constellation authorization to use its Fixed-Satellite Service (“FSS”) frequencies in the Ku, Ka, V, and E band for Mobile-Satellite Service (“MSS”) operations. This highlights that next-generation satellite operators will require not just reliable access to these frequencies, but more flexible access too indicating the blurring of traditional distinctions between FSS and MSS bands. With technological advancements the NGSO satellite operator aim to deliver high-speed, low-latency connectivity that supports both fixed and mobile use cases, providing seamless coverage to end user where the networks such as mobile and fixed, as well as terrestrial and satellite are increasing interweaved. This convergence allows for a seamless integration of services, enabling satellite networks to compete more effectively with terrestrial networks while providing similar competing communication services to retail and enterprise users.
- c. As these technologies continue to evolve, it is essential for spectrum policies to remain flexible and forward-looking. Spectrum assignment should account for the potential of unified communication networks that seamlessly integrate terrestrial and satellite systems. Ensuring that spectrum assignment methodologies promote competition and innovation will be key to driving growth in both the SatCom and terrestrial telecom sectors.

5. The SatCom Sector: High Potential Impact

- a. Traditionally, satellite communication has been viewed as a solution for rural, remote, and underserved areas where terrestrial networks face limitations. However, this narrative is rapidly shifting. Advanced satellite systems, such as SpaceX’s Starlink and Amazon’s Kuiper, are now delivering high-speed, low-latency internet services that directly compete with terrestrial broadband providers, provided to retail and enterprise users. The SatCom sector is no longer confined to offering



complementary services but is also providing competing services with a direct-to-consumer model, providing services like broadband, internet, and voice communication that rival terrestrial networks.

- b. The entry of satellite-based services into these markets introduces new competition and disrupts the status quo, particularly as SatCom operators are now capable of offering capacity, speeds and service quality comparable to terrestrial networks. As SatCom operators increasingly target the retail and enterprise customers, they introduce direct competition to terrestrial providers, challenging the existing market structure and creating new choices for consumers.
- c. Satellite operators like Starlink and Amazon's Kuiper are creating capacities that rival those of India's leading terrestrial network operators. Starlink's deployed constellation, with its Gen1 and Gen2 satellites, will offer substantial global capacity, with a significant portion allocated to India, equating to a large percentage of the current data traffic handled by major telecom companies like Reliance Jio, Airtel, and Vodafone Idea. Similarly, Amazon's Kuiper constellation, with its planned satellites, will provide significant global capacity, including a substantial portion for India.
- d. This growing capacities and competition will likely reshape the dynamics of the telecom industry, with satellite operators becoming formidable players especially in high capacity demand from retails and enterprises in urban regions. The deployments of FWA by terrestrial and FSS by satellite operators providing connectivity to home/residential and enterprise customers are similar in nature.
- e. Urban and semi-urban regions, with their high-revenue customer base and demand for reliable, fast internet services, are traditionally served by terrestrial operators. Technological advancements such as Direct-to-Device (D2D) services and the integration of satellite systems into 5G networks through 3GPP standards are further accelerating the convergence of satellite and terrestrial communication.
- f. These technologies enable satellite services to offer seamless, high-speed connectivity to urban/ semi-urban areas and retail consumers, directly challenging traditional telecom providers. As a result, SatCom is increasingly viewed not just as a solution for connectivity in remote areas but as a competitive alternative in cities and towns in urban and semi-urban regions where terrestrial networks have historically been dominant.
- g. This shift of satellite services competing with terrestrial networks marks a critical juncture for the SatCom sector. **Hence, any differentiation adopted in spectrum assignment, pricing and other licensing/regulatory policies for satellite based Mobile (MSS) and Fixed Wireless services (FSS) servicing both retail and enterprise customers incl. any other retail customers in urban regions would directly compete with present terrestrial services. This would also irreparably tilt the level playing field and impact the investment made by terrestrial service providers who procured the spectrum at market discovered price.**

6. Ensuring a Level Playing Field: Same Service, Same Rules

- a. The principle of "Same Service, Same Rules" is vital to maintaining fair competition between terrestrial and satellite operators. When satellite services compete with



terrestrial networks by offering similar services to retail & enterprise customers, they must be subject to the same spectrum pricing, regulatory levies, and licensing fees as terrestrial operators.

- b. For the services where satellite compete directly with terrestrial services, the government should adopt a spectrum assignment and pricing policy that ensures the cost for satellite spectrum used in competitive services is comparable to that of terrestrial spectrum. This would prevent regulatory arbitrage and maintain fairness in the market. Comparable pricing of satellite spectrum with terrestrial spectrum is critical for ensuring a fair competitive environment. This ensures that both satellite and terrestrial networks compete on equal terms without favoring one type of service over the other.
- c. If the TRAI chooses to recommend assignment of satellite spectrum administratively for competing services, it is crucial to ensure that the spectrum charges are also recommended as comparable to the prices paid by terrestrial operators for similar services. This would prevent satellite operators from gaining an unfair financial advantage over terrestrial operators and ensure a fair competitive environment especially in Urban and semi-urban regions.
- d. Such a policy would protect the investments made by terrestrial operators while encouraging healthy competition between satellite and terrestrial services. At the same time, differentiated pricing for satellite spectrum used only in non-competitive services in remote areas or government services, would allow satellite services to grow where they are most needed without burdening the sector with unnecessary costs.

7. Pricing, Tenure and Reassessment of spectrum assignment method

- a. To ensure a level playing field, the government should adopt a differentiated spectrum pricing strategy. Adopting different assignment approaches for (a) satellite services competing directly with terrestrial networks and for (b) satellite services not directly competing will ensure fairness in assignment process and helps in maintaining level playing field.
- b. **Satellite communication services (from GSO/NGSO) that do not directly compete with terrestrial networks are intended for specific use cases, including government agencies such as defence and disaster recovery, as well as VPN/CUG-based communication services through GSO satellites, cellular backhaul, long-distance point-to-point links, and non-retail services in rural and remote areas, should be assigned spectrum on administrative pricing. Except the above use cases, for any other use case viz. direct retail customers etc., the VSAT licensee shall not be allowed to provide any service to consumers, directly or indirectly by obtaining any other license such as ISP. The point-to-point links can be provided by having NLD/ILD licenses.**
- c. **On the other hand, services that directly compete with terrestrial networks, such as (i) satellite-based mobile services (MSS or 3GPP-based), (ii) satellite-based Fixed Wireless Services (FSS or 3GPP-based), and (iii) Enterprise Services through NGSO constellations and any other retail services directly to customers in urban and semi-urban areas, will operate under a GMPCS license. To ensure a level playing field, the Spectrum pricing for these**



competing services should be aligned and benchmarked with market discovered price of the spectrum for terrestrial networks. Since, MSS band spectrum should be assigned on exclusive basis, possibility of auction to determine the market price can be explored even in L&S spectrum bands. In all other spectrum bands for MSS, auction is the only option as the point no. 16 of the First Schedule of the Telecommunication Act 2023 covers L&S bands for MSS. In case of FSS bands, if Government decides to assign this spectrum on exclusive basis, the possibility of auction may be explored.

- d. To support the growth of this emerging sector while ensuring fair competition, it is advisable that any administrative assignment should be limited for an initial period of 2 to 3 years. This limited validity allows for a period of evaluation to assess how SatCom develops and a reassessment at the end of this period will enable the government and regulators to review the assignment process.

8. Summary

- a. To summarize, the rapid evolution of satellite communication services, particularly NGSO constellations, presents both opportunities and challenges for India's telecommunications sector. While SatCom has the potential to bridge the digital divide in rural and remote areas, its growing competition with terrestrial networks in urban markets raises important questions about spectrum assignment, pricing, and regulatory fairness.
- b. **To ensure a level playing field, spectrum assignment for satellite services must be aligned with the principles of transparency and competition that govern terrestrial networks, as well as provisions of the Telecommunications Act 2023. Comparable spectrum pricing to terrestrial services should be enforced for satellite services providing services in Urban areas/retail customer, while administrative assignments with nominal pricing may be applied for traditional use cases in rural and remote areas including government functions, disaster recovery, cellular backhaul and sectors like defence, maritime, and aviation.** By adopting a flexible and forward-looking approach to spectrum policy, the government can foster innovation, encourage investment, and promote fair competition in both the satellite and terrestrial telecommunications sectors.

Our detailed response on the queries raised in the Consultation Paper are as below:

Q.1. Which frequency band(s)/ range(s) should be considered for the assignment to NGSO based Fixed Satellite Services for providing data communication and Internet service? Please provide a detailed response separately for the user link and feeder link.

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Q.2. Which frequency band(s)/ range(s) should be considered for the assignment to GSO/ NGSO based Mobile Satellite Services for providing voice, text, data, and Internet service. Please provide a detailed response separately for the user link and feeder link.

[COAI response](#)



- a. The traditional separation of frequency bands for satellite services like FSS and MSS is becoming outdated due to technological advancements. Communication networks are moving towards being technology-agnostic, making these distinctions less efficient for optimal spectrum use. Therefore, all satellite frequency bands (L, S, C, Ku, Ka, etc.) should be flexibly assigned satellite services inline with ITU Radio Regulations and India's NFAP-2022, supporting efficient spectrum use and fostering innovation by satellite operators. However, the IMT bands including the backhaul bands/frequencies must be protected.

- Q.3. What should be the maximum period of assignment of spectrum for –**
- a. **NGSO based Fixed Satellite Services for providing data communication and Internet services, and**
 - b. **GSO/ NGSO based Mobile Satellite Services for providing voice, text, data, and Internet services?**
- Please provide a detailed response alongwith international practice in this regard.**

COAI response

- a. Given the rapid pace of technological changes in satellite communications, it is recommended that spectrum for NGSO-based Fixed Satellite Services and GSO/NGSO-based Mobile Satellite Services be assigned for a period of 2-3 years initially for satellite communication services (from GSO/NGSO) that do not directly compete with terrestrial networks such as government agencies incl. defence and disaster recovery, as well as VPN/CUG-based communication services through GSO satellites, cellular backhaul, long-distance point-to-point links, and non-retail services in rural and remote areas. The limited validity aligns with the practice of allowing for periodic reassessment of the sector's growth and the effectiveness of current spectrum assignment policies.

- Q.4. For assigning spectrum for NGSO-based communication services, whether every ITU filing should be treated as a separate satellite system? Please provide a detailed response alongwith international practice in this regard.**

COAI response

- a. For assigning spectrum or NGSO-based communication services, every ITU filing should not necessarily be treated as a separate satellite system. It should depend on the requirements of the respective operators. Accordingly, the operators should only be required to file a written declaration as to which ITU filings will be used by them – thus providing the requisite flexibility for different types of business cases and technologies.

- Q.5. Whether the provisions of ITU-RR are sufficient to resolve interference related challenges and coordination issues? If not, what additional conditions should be prescribed while assigning frequency spectrum for –**



a. **NGSO based Fixed Satellite Services for providing data communication and Internet services; and**

b. **GSO/ NGSO based Mobile Satellite Services for providing voice, text, data, and Internet services?**

Please provide a detailed response alongwith international practice in this regard.

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Q.6. For satellite earth station gateways of different satellite systems operating in the same frequency range, whether there is a need to prescribe a protection distance or any other measures to avoid interference from each other–

a. Between the gateways of GSO and NGSO systems; and

b. Between the gateways of NGSO systems?

If yes, please provide a detailed response alongwith international practice in this regard.

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Q.7. In case the spectrum assigned for satellite gateway links is also assigned to terrestrial networks such as Fixed Service, IMT etc., what protection distance or criterion should be included in the terms and conditions of the assignment of spectrum for satellite gateway links to avoid any interference to/ from terrestrial networks? Please provide a detailed response alongwith international practice in this regard.

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Q.9. Whether there is a need to prescribe any conditions to mitigate the risk of scarcity of satellite gateway sites? If yes, please provide a detailed response alongwith international practice in this regard.

COAI response

a. The ITU Radio Regulations provide a basic framework for interference management, but they fall short in addressing the complexities of rising NGSO satellite numbers. For mitigating interference between satellite operators using the same frequencies for Gateway Feeder Links, the exclusion zones with proper separation or protection distance are essential to protect GSO, NGSO, and terrestrial networks from interference. These zones should be based on a thorough analysis of frequency usage and operational parameters and assigned through to operators for ensuring efficient spectrum utilization. There is a need for optimal size for Gateway exclusion zones that will restrict terrestrial transmissions within a specified radius around satellite gateways, minimizing interference while avoiding gaps in terrestrial coverage.

b. The exclusion radius should be determined through coexistence analysis to optimize feeder link spectrum use. Strategically placed Gateway Exclusion Zones (GEZs) will help meet the growing satellite demand and reduce interference, while still preserving terrestrial coverage. The operator and DoT's WPC wing could coordinate in finalizing the GEZ location and further minimize interference.



Q.8. In case the spectrum assigned to the satellite user link is also assigned to terrestrial networks such as Fixed Service, what criterion should be included in the terms and conditions of the assignment of spectrum for satellite user links to avoid any interference to/ from terrestrial networks? Please provide a detailed response alongwith international practice in this regard.

COAI response

- a. Existing terrestrial networks, such as fixed networks (MWA, MWB, etc.), can continue to operate without interference under current practices established by WPC in line with NFAP-2022 and ITU Radio Regulations, and are required to be protected. To optimize the use of scarce spectrum resources, a flexible assignment approach is needed, especially as satellite constellations now support both backhaul and direct-to-device services. With advancements in satellite and terrestrial networks converging on similar spectrum bands, a flexible strategy would enable operators to tailor their use cases while minimizing interference, promoting efficient spectrum utilization and supporting evolving technological needs. In the event that the band is shared with IMT/MWA, then the location of satellite gateways shall be allowed only in remote rural areas, and in such a way that it does not interfere with the terrestrial deployments in the band under consideration.

Q.10. In addition to the roll-out conditions recommended by TRAI for satellite-based Telecommunication Service Authorisation through its recommendations on the Framework for Service Authorisations to be Granted Under the Telecommunications Act, 2023 dated 18.09.2024, whether there is a need to impose certain additional roll-out obligations for the assignment of frequency spectrum for –

c. NGSO based Fixed Satellite Services for providing data communication and Internet services;

d. GSO/ NGSO based Mobile Satellite Services for providing voice, text, data, and Internet services?

Please provide a detailed response alongwith international practice in this regard.

COAI response

- a. We recommend introducing phased roll-out obligations for satellite services to ensure timely deployment and efficient spectrum use. These obligations will ensure operator commitment and expand access to satellite services nationwide.

Q.11. Whether there is a need to introduce a provision for surrender of frequency spectrum prior to the expiry of the period of validity of spectrum assigned for –

c. NGSO based Fixed Satellite Services for providing data communication and Internet services;

d. GSO/ NGSO based Mobile Satellite Services for providing voice, text, data, and Internet services?

If yes, what should be the process, and associated terms and conditions such as minimum period of spectrum holding, notice period, surrender fee, etc.? Please provide a detailed response with justifications.

COAI response



- a. A provision for surrendering auction-assigned spectrum should be kept so that satellite service providers could return spectrum after a notice period without extra dues. Additionally, spectrum trading and leasing should be allowed to enable flexible management, promoting efficient use and adaptability to changing business needs and technologies.

Q.12. Whether there is a need to prescribe timelines for processing the applications for the assignment of frequency spectrum for-
c. NGSO based Fixed Satellite Services for providing data communication and Internet services;
d. GSO/ NGSO based Mobile Satellite Services for providing voice, text, data, and Internet services?
Please provide a detailed response with justifications.

COAI response

- a. Yes, there should be a prescribed timeline for processing the applications
- b. Also, the applications should be put to public domain say 3 months in advance – to ensure that there is prior information before any administrative assignment and other stakeholders are getting sufficient time to study and respond.
- c. All required licensing approvals, including those for networks, spectrum, and uplink permissions, should follow a strict timeline, ensuring completion within two months of submission. This will support the timely deployment of services.

Q.13. Whether there are any other suggestions related to assignment of spectrum for-
a. NGSO based Fixed Satellite Services for providing data communication and Internet services;
b. GSO/ NGSO based Mobile Satellite Services for providing voice, text, data, and Internet services?
Please provide a detailed response with justifications.

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Q.14. Should spectrum charges for NGSO-based FSS providing data communication and Internet services, be levied:
i. On a per MHz basis,
ii. On a percentage of Adjusted Gross Revenue (AGR) basis, or
iii. Through some other methodology?
Please provide a detailed justification for your answer.

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Q.15. In case it is decided that spectrum charges for NGSO-based FSS providing data communication and Internet services should be levied on a per MHz basis, should these charges be calculated based on:
i. The Department of Telecommunications (DoT) order dated December 11, 2023,
or
ii. An alternative approach (please specify)?
Please provide a detailed justification to support your answer.



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- Q.16.** If it is decided that spectrum charges for NGSO-based FSS providing data communication and Internet services should be levied on a percentage of AGR basis:
- i.** What should be the appropriate percentage of AGR?
 - ii.** Should a minimum spectrum charge be specified to address the issue of inefficient utilization of spectrum? If yes, what methodology may be used to determine the amount of the minimum spectrum charge?
 - iii.** Is there an alternative approach that could be followed to address the issue of inefficient spectrum utilization?
- Please provide a detailed justification for your answers.

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- Q.17.** Considering the Adjusted Gross Revenue (AGR) based charging methodology currently followed for Commercial VSAT and in view of the enhanced scope of the Satellite service authorisation, what should be the spectrum charge, as a percentage of AGR, that should be levied on GSO-based FSS? Or, Should some alternative spectrum charging methodology be used for determining spectrum charges for GSO-based FSS?
- Please provide a detailed justification for your answer.

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- Q.18.** Should spectrum charges for GSO and NGSO-based MSS that provide voice, text, data, and Internet services be levied:
- i.** On a per MHz basis,
 - ii.** On a percentage of AGR basis, or
 - iii.** Through some other methodology?
- Please provide a detailed justification for your answer.

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- Q.19.** If it is determined that spectrum charges for GSO/NGSO-based MSS providing voice, text, data, and Internet services should be levied on a per MHz basis, should these charges be calculated based on:
- i.** The Department of Telecommunications (DoT) order dated December 11, 2023, or
 - ii.** An alternative approach (please specify)?
- Please provide a detailed justification to support your answer.

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- Q.20.** If it is decided that spectrum charges for GSO/NGSO-based MSS providing voice, text, data, and Internet services should be levied on a percentage of AGR basis:
- i.** What should be the appropriate percentage?
 - ii.** Should a minimum spectrum charge be specified to address the issue of inefficient utilization of spectrum? If yes, what methodology may be used to determine the amount of the minimum spectrum charge?



iii. Is there an alternative approach that could be followed to address the issue of inefficient spectrum utilization?

Please provide a detailed justification for your answers.

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Q.21. Whether there are any other issues/suggestions relevant to the spectrum charging for:

i. NGSO/GSO based FSS providing data communication and Internet services.

ii. NGSO/GSO based MSS providing voice, text, data, and Internet services.

The response may be submitted with proper explanation and justification.

COAI response

- a. The consultation paper should address the critical need for a level playing field between satellite and terrestrial access services, especially in urban areas. With the convergence of satellite and terrestrial networks, especially with advancing technologies like NGSO systems, it's essential to implement a fair, uniform regulatory approach.
- b. A SUC/revenue share regime can be applied for satellite communication services (from GSO/NGSO) that do not directly compete with terrestrial networks which are intended for specific use cases i.e., including government agencies such as defence and disaster recovery, as well as VPN/CUG-based communication services through GSO satellites, cellular backhaul, long-distance point-to-point links, and non-retail services in rural and remote areas. Further, suitable restrictions should be prescribed to ensure said spectrum is utilised for these limited purposes as prescribed and not used for the services competing with terrestrial network.
- c. On the other hand, services that directly compete with terrestrial networks, such as (i) satellite-based mobile services (MSS or 3GPP-based), (ii) satellite-based Fixed Wireless Services (FSS or 3GPP-based), and (iii) Enterprise Services through NGSO constellations and any other retail services directly to customers in urban or semi-urban areas, will operate under a GMPCS license. To ensure a level playing field, the Spectrum pricing for these competing services (irrespective of auction or administrative assignment) should be aligned and benchmarked with market discovered price of the spectrum for terrestrial networks and also a revenue share/SUC for non-competing services. Since, MSS band spectrum should be assigned on exclusive basis, possibility of auction to determine the market price can be explored. In case of FSS bands, if Government decides to assign this spectrum on exclusive basis, the possibility of auction may be explored.
- d. A policy of comparable spectrum pricing for satellite services in competing services would safeguard the investments made by terrestrial operators while fostering healthy competition between satellite and terrestrial services. This approach ensures that both terrestrial and satellite communication services operate on a level playing field, promoting fairness and encouraging innovation. By maintaining consistent pricing structures, the regulator and Government can prevent any one service from gaining an unfair advantage based on pricing of a regulated national resource, allowing both satellite and terrestrial providers to thrive in overlapping markets.


