



VIL/P&O/TRAI/AK/2024/119
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Advisor (Networks, Spectrum and Licensing)
Telecom Regulatory Authority of India,
4th, 5th, 6th & 7th Floor, Tower-F,
World Trade Centre, Nauroji Nagar,
New Delhi – 110029

Kind Attn: Shri. Akhilesh Kumar Trivedi

Subject: Comments on the TRAI's Consultation Paper on "Terms and Conditions for the Assignment of Spectrum for Certain Satellite-Based Commercial Communication Services" dated 27.09.2024

Dear Sir,

This is in reference to the TRAI's Consultation Paper on "Terms and Conditions for the Assignment of Spectrum for Certain Satellite-Based Commercial Communication Services" dated 27.09.2024.

In this regard, kindly find enclosed herewith comments from Vodafone Idea Limited on the above-said consultation paper.

We hope our comments will merit your kind consideration please.

Thanking you,

Yours sincerely,

For Vodafone Idea Limited

Ambika Khurana
Chief Regulatory and Corporate Affairs Officer

Enclosed: As stated above



**VIL Comments to the TRAI Consultation Paper on the
“Terms and Conditions for the Assignment of Spectrum for
Certain Satellite-Based Commercial Communication Services”
issued on 27.09.2024**

At the outset, we are thankful to the Authority for giving us this opportunity to provide our comments to the TRAI Consultation Paper on “Terms and Conditions for the Assignment of Spectrum for Certain Satellite-Based Commercial Communication Services” issued on September 27, 2024.

Executive Summary:

1. The DoT reference explicitly seeks recommendations on terms and conditions including spectrum pricing while accounting for level playing field with terrestrial access services. However, the issues put up for consultation by the Authority nowhere address this part of DoT’s reference and hence, it lacks transparency in consultations and gives inadequate opportunity to stakeholders to respond properly on various linked elements influencing level playing field.
2. A level playing field is a must between terrestrial and satellite-based communication services and spectrum therein, to foster a more robust, innovative, and consumer-friendly communication landscape in the country.
3. We strongly urge that a supplementary consultation paper should be issued covering detailed deliberations on each and every aspect influencing level-playing field. Specific sections including questions need to be formulated on various factors like spectrum cap, validity, rollout obligations, pricing, payment terms and conditions, etc. to ensure all the pillars of level-playing field are fairly consulted, deliberated and opportunity provided to submit comments by all stakeholders. This will enable the Authority for providing well considered recommendations to the Government.
4. Except for entries listed in First Schedule (in the instant case point no. 16 of the First Schedule can be referred), spectrum for all other telecommunication purposes has to be assigned through auction only.
5. The methodology of administrative allocation to Mobile Satellite Service (MSS) is restricted only w.r.t. L and S bands. All other bands to be used for MSS are not part of this Schedule and hence, outside the ambit of administrative assignments. Even in case of L and S bands, where these bands are involved in delivering a competing service, the pricing must be aligned/benchmarked to the market-based prices paid by terrestrial operators.



6. **GMPCS authorisation encompass only MSS in its scope and Fixed Satellite Services (FSS) was not part of the GMPCS service when the Telecommunications Act, 2023 was laid before the Parliament for approval. Therefore, the administrative assignment of spectrum to be given under GMPCS authorisation, can only be for MSS and it cannot be for FSS. Changing the scope of GMPCS authorisation to cover FSS for the purpose of administrative allocation of the spectrum, would be against the provisions and intent of the Telecommunication Act, 2023.**

7. **There should be suitable conditions and restrictions on the spectrum utilisation if spectrum is assigned administratively (only in those cases where objective is to serve only those areas where terrestrial coverage from any TSP is not available and spectrum is allocated at nominal cost), so as to fulfil the policy objectives and not to gain competitive advantages over other commercial services like mobile services being given by access service providers. Some such conditions are as below:**
 - a. **The services through this spectrum should be utilised to serve only those areas where terrestrial coverage from any TSP is not available/not feasible.**

 - b. **The services through this spectrum should only be provided under partnerships with the existing access service providers, and no customer will be acquired by the entity independently.**

 - c. **The spectrum allocation may be made only for 2 years to support the new technology for non-commercial communication services. For commercial communication services, no relaxations should be given and level playing field should be maintained with norms of spectrum allocation to access service providers.**

8. **Exclusive or Shared Assignment and Geographic area**
 - a. **User links:** These should be assigned on exclusive basis at LSA level, to maintain level playing field.

 - b. **Feeder links:** These should also be assigned on exclusive basis at link level/Geographical area level. The concerned entities should be mandated to allow sharing to other licensees.

9. **Spectrum Valuation/Pricing – For all except L and S bands:**
 - a. **Section 4(4) of The Telecommunications Act 2023, provides for assignment of the spectrum through auction or on administrative basis. However, this Section does not provide any relaxation in terms of payment of market determined /market related price for assignment of spectrum. The provision for pricing and payment of all the Spectrum is covered under section 4(3). Thus, it is important to ensure that market determined/market related price, at an LSA level, is taken for the Satellite related spectrum also, be it through auction or through administrative allocation.**



- b. **The prices should be charged/determined on a per MHz basis at LSA level, linked to prices of the spectrum already auctioned and being used by the TSPs is an appropriate mechanism for determining pricing for satellite spectrum.**
 - c. **In case satellite spectrum is allowed to offer voice, data or any connectivity services to the end customers, then such spectrum/ operators should comply with all the relevant terms and conditions as applicable to existing TSPs including licensing norms, payment of License Fee and spectrum usage charges as a % of AGR, compliance to other conditions like security conditions including Lawful Interception, KYC, Data Privacy, TRAI's Regulations and tariff orders including for subscriber acquisition and servicing, etc.**
 - d. **The pricing for spectrum should be in correlation with the recent auction prices and should be on LSA basis only.**
 - e. **The auction methodology and all related modalities should remain same as is applicable for IMT spectrum auction.**
10. **Spectrum Valuation/Pricing - Administrative allocation (applicable only for L and S bands for MSS under GMPCS):**
- a. **This valuation exercise should be based on spectral efficiency of a particular spectrum band as compared to an existing auctioned spectrum band (TRAI has consistently used 1800 MHz prices for benchmarking valuation for other spectrum bands).**
 - b. **Also, the pricing for spectrum should be in correlation with the recent auction prices and should be on licensed service area wise basis only.**
11. **New Technologies Supporting Complementary Satellite Based Services over IMT Spectrum:**
- a. **New technologies are shaping up globally, which will lead to convergence of terrestrial and space-based networks. Considering these services will ride on existing network infrastructure, existing end devices of consumers and be using same spectrum which is already being utilized by TSPs, such technologies will serve as an additional means to provide services in remote and rural areas and hence, will require support of enabling policies.**
 - b. **As IMT spectrum is acquired through auction and on market determined price, it should be clarified that the said spectrum can also be used for providing communication services through a mix of or one of the terrestrial or satellite mediums.**
12. **The frequency band 10.7 – 12.75 GHz (Space to Earth) and 13.75 – 14.5 GHz (Earth to Space) seems to be ideally suited for FSS without impacting existing MWA services and future IMT services. Only fixed terminals should be allowed to be served in far-flung remote unserved regions**



with mobility restrictions by Satellite service providers and should be governed by same set of rules as the Mobile Service Providers to ensure establish a level playing field with terrestrial access services.

13. **To maintain level playing field, the validity of spectrum should be kept as 20 years.** As noticed during the previous auctions, change in validity would impact the pricing and the payment to be made by the spectrum acquirer.
14. As each satellite system shall require separate frequency assignment and spectrum being a scarce resource, every ITU filing can be treated as separate satellite system. However, the terms and conditions of assignment, pricing and scope be governed as per law of land prevalent in India.
15. A well-established coordination system exists under the ITU RR framework where multiple types of satellite providers coexist in the same frequency band and deliver optimal outcomes and is found to be effective for most of the cases. In case such a co-existence is not verified as part of ITU, then extensive studies shall be conducted to ensure the protection of existing service for co-existence of the services.
16. **In case of competing satellite services, the roll-out obligations as mandated for spectrum assigned to access communication service providers, should also be mandated for spectrum intended to be used for space-based communication services in case satellite spectrum is allowed to offer voice, data or any connectivity services to the end customers. Spectrum being a finite and valuable resource, every spectrum holder should be obliged equally to discharge its duty to the society at large. However, in case such spectrum is utilised to serve only those areas where terrestrial coverage from any TSP is not available the roll-out obligations may be relaxed.**
17. For the cases of administrative assignment of frequency spectrum, the applications should be put up for public information on DoT's website, with a 3 months' advance information.

Preface

A. Increasing Convergence of Terrestrial and Satellite Communication Services:

1. The assignment of spectrum to satellite services is a critical topic, especially given the rapid advancements in the satellite communication sector and its increasing convergence with various communication services.
2. 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.



3. Advancements in NGSO constellations 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 satellite communication services are 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.
4. This shift has significant implications for spectrum assignment and pricing. The competitive presence of satellite communication 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.
5. Given the massive capacities that satellite constellations are bringing to the market, it is evident that they will become strong competitors to terrestrial operators especially in 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.

B. Level Playing Field

1. DoT's Instant Reference Dated 11.07.2024

- a. TRAI, in its consultation paper has annexed reference sent by DoT vide letter dated 11.07.2024 to the Authority under Section 11(1)(a) of the TRAI Act, 1997 on the subject – 'Seeking TRAI recommendations on terms and conditions of spectrum assignment including spectrum pricing for certain satellite-based commercial communication services'.
- b. In this regard, we would like to highlight that the DoT reference explicitly seeks recommendations on terms and conditions including spectrum pricing while accounting for level playing field with terrestrial access services. Extract of the same is reproduced below:

*Keeping in view the provisions of Section 4 and the First Schedule of the Telecommunications Act-2023, in terms of Section 11(1)(a) of TRAI Act 1997, **TRAI is requested to provide its recommendations on terms and conditions of spectrum assignment including spectrum pricing while accounting for level playing field with terrestrial access services for the following satellite-based communication services:***

- i. NGSO based Fixed Satellite Services providing data communication and Internet services. In its recommendations, TRAI may take into account services provided by GSO-based satellite communication service providers.*



ii. *GSO/ NGSO based Mobile Satellite Services providing voice, text, data, and internet services.”*

- c. However, the consultation paper does not carry any questions or detailed deliberation on this important aspect of level playing field. The level playing field is influenced by various factors related to setting up of networks, running them and provision of communication services. The issues put up for consultation by the Authority nowhere address this part of DoT’s reference and hence, it lacks transparency in consultations and gives inadequate opportunity to stakeholders to respond properly on various linked elements influencing level playing field.
- d. **Therefore, we strongly urge that a supplementary consultation paper should be issued covering detailed deliberations on each and every aspect influencing level-playing field.**

2. Need of Level Playing Field

- a. Level playing in any sector, is crucial for fostering a healthy, dynamic, and equitable ecosystem. It builds trust in stakeholders as they are more likely to engage and participate in provision of products/services when they believe the rules are fair and transparent.
- b. The level-playing field amongst the satellite and terrestrial communication services, is vital due to the following reasons:
 - i. **Consumer Benefits:** A balanced ecosystem allows consumers to benefit from diverse services. The satellite and terrestrial networks can complement each other, providing better coverage and service in rural or underserved areas.
 - ii. **Competition:** Ensuring fair competition encourages innovation and improvements in services. If any regulatory or financial advantages are extended to selected set of services/technologies, the same can stifle the competition and limit consumer choice.
 - iii. **Regulatory Fairness:** Equal regulatory requirements to all the players in the ecosystem help prevent market distortions. When both types of communication will face similar rules and regulatory framework, it will promote investment and growth across the board.
 - iv. **Technological Advancements:** Encouraging both satellite and terrestrial technologies fosters innovation. Each sector can drive advancements that benefit the other, leading to improved overall communication infrastructure.
 - v. **Investment Incentives:** Fair treatment in terms of licensing, spectrum access, and funding will encourage investment in both sectors, leading to better infrastructure and services to end consumers.



- vi. **Crisis Resilience:** Diverse communication options enhance resilience in emergencies. Having both satellite and terrestrial services operating effectively on equal grounds will ensure that communication remains available to the general public during crises.
- c. **Considering all above, a level playing field is a must between terrestrial and satellite-based communication services and spectrum therein, to foster a more robust, innovative, and consumer-friendly communication landscape in the country.**

3. Key factors influencing Level Playing field

- a. Communication over any form of networks is foundation to modern life, supporting a wide array of activities that enhance connectivity, economic growth, and overall quality of life. With the introduction of new form of communication services, there is a need to ensure that a fair and transparent regulatory environment is created in the sector which benefits both the providers and end consumers.
- b. Access service provider use access spectrum for reaching out to end devices (or consumers) as well as backhaul spectrum for carrying traffic within its network nodes. Similarly, the satellite service providers require user links for reaching out to end devices (or consumers) interconnecting satellite to user and vice-versa as well as feeder links for carrying traffic within its network nodes (i.e. Satellite to Gateway or vice-versa). To this extent, both type of spectrum within satellite-based networks play similar roles i.e. connecting users and connecting internal nodes, just like it is in access networks.
- c. In this regard, please find below some out of the many factors, which influence level-playing field amongst the substitutable communication service providers:
 - i. **Spectrum Assignment Methodology:** Spectrum is one of the major cost items for the access service providers for providing communication services to consumers. Also, spectrum portfolio acquired by the TSP is influenced by the auction process, spectrum availability, etc., which further directly influences the deployment of next generation technologies, penetration of network and quality of services received by the consumers. As such, Spectrum assignment methodology across terrestrial and satellite mediums, be it user links/feeder links or access/backhaul spectrum will directly influence the level playing field amongst these communication service providers.
 - ii. **Spectrum Pricing and Payment options:** Spectrum is one of the major cost items for access service providers as such, its pricing, payment options and other terms and conditions, for user links/feeder links or access/backhaul spectrum will directly influence the level playing field amongst these communication service providers.



- iii. **Spectrum Validity:** Spectrum validity is one of the key pillars of spectrum pricing. In one of the recent recommendations, the Authority recommended spectrum pricing for 30 years spectrum validity. However, this was found challenging and stakeholders requested DoT for auctioning the spectrum with 20 years validity, as it helped bring down the overall spectrum pricing. As the request was accepted, the spectrum was acquired with 20 years validity despite the option of choosing 30 years validity. Thus, spectrum validity is another key influencing factor for level playing field between access spectrum and satellite spectrum.
- iv. **Spectrum Cap:** The capping on quantum of spectrum is a regulatory limit on the amount of radio frequency spectrum that a single company can hold. It helps ensure competition in the telecommunications market by preventing any single provider from purchasing spectrum in excess thereby, dominating access to essential frequencies needed for various communication services. Since the services are dependent on the scarce resource, it is necessary that spectrum caps are appropriately set to help maintain a competitive environment that fosters innovation and improves service quality while safeguarding consumer interests.
- v. **Surrender of Spectrum:** Spectrum, being a finite resource, provisions on returning it, if not in use or any other reason, play a key role to enable efficient utilization of the spectrum across all services and can disturb the level playing field if not uniformly defined for all services using it.
- vi. **Roll-out obligation and TSTP:** Rolling out the services in line with the standards and guidelines as prescribed by the Government is important for all types of communication services using spectrum as it ensures that the acquired spectrum is not lying unused with the service providers and when used, meets all the standards and guidelines laid down by the Government.
- vii. **Spectrum Sharing and Trading:** Spectrum, being a finite resource, its sharing allows for more efficient use, maximizing the benefits derived from available frequencies. Trading the same also can enable fostering competition and innovation in the telecom sector and help reduce costs associated with acquisition of spectrum. Hence, terms and conditions related to these activities play an important role across various communication services to ascertain level playing field.
- viii. **Exclusive v/s non-exclusive assignment:** Similar to above, exclusive or non-exclusive assignment also play a key role in maintaining level-playing field between different communication services. To maintain level playing field between satellite and terrestrial players, it would be imperative to ensure that the norms on exclusive/non-exclusive assignment are kept uniform across the two.



- ix. **License fees:** Being cognizant of the need for the long-term growth and sustainability of the telecom sector, infusing liquidity and encouraging investment, it is important that the license fee is also kept uniform across terrestrial and satellite players and level playing field is maintained.
 - x. **Licensing norms:** In addition to the license fees, the norms which drive the license are equally important and need to be defined in detail to apprise the entities who wish to get into this business. These norms affect all the entities in the business, hence, an important factor in ensuring the level playing field.
 - xi. **Security Conditions including Lawful Interception:** Robust security measures protect user data and networks from unauthorized access and breaches, maintaining trust between users and service providers. Overall, incorporating security conditions and lawful interception into any type of communication service is essential for balancing user privacy, safety, and compliance with legal frameworks. Hence, such conditions play a key role in ensuring that all service providers promote fairness, trust, and competition in the industry, as such, all such conditions should be uniform across communication service players thereby, maintaining the level playing field.
 - xii. **TRAI's Regulations and tariff orders:** In addition to the above provisions which are usually laid out by the Department of Telecommunications (DoT), there are several regulations and orders issued by TRAI e.g. related to unsolicited commercial communication (UCC), Quality of Service (QoS), tariffs and consumer grievance redressal mechanism etc., which are equally important and play an important role to establish level playing field across all types of communication service providers. These points related to QoS, tariff, UCC impact the consumer experience and also influence the level-playing field between terrestrial and satellite players. Therefore, it is imperative that regulatory norms especially related to tariffs to end consumers, QoS, UCC should apply to satellite players as are applicable to terrestrial access service providers.
- d. **Considering all above, it is most important that specific sections including questions are formulated on each of the above factors (atleast), to ensure all the pillars of level-playing field are fairly and transparently consulted, deliberated and opportunity provided to submit comments by all stakeholders. This will enable the Authority for providing well considered recommendations to the Government.**

C. Spectrum under 1st Schedule of The Telecommunications Act, 2023

1. The DoT reference dated 11th July 2024 seeks recommendations from TRAI, keeping in view the provisions of Section 4 and the First Schedule of the Telecommunications Act 2023. The Section 4 provides that the spectrum shall be assigned for telecommunication through auction



except for entries listed in the First Schedule for which assignment shall be done through administrative process. Extract of Section 4(4) is given as follows:

“(4) The Central Government shall assign spectrum for telecommunication through auction except for entries listed in the First Schedule for which assignment shall be done by administrative process.”

2. **Therefore, except for entries listed in First Schedule (in the instant case point no. 16 can be referred), spectrum for all other telecommunication purposes has to be assigned through auction only.**
3. The First Schedule on “Assignment of Spectrum through Administrative Process” of the Telecommunications Act, 2023 states as below:

16. Certain satellite-based services such as: Teleports, Television channels, Direct To Home, Headend In The Sky, Digital Satellite News Gathering, Very Small Aperture Terminal, Global Mobile Personal Communication by Satellites, National Long Distance, International Long Distance, Mobile Satellite Service in L and S bands.

4. The above clearly indicates that the administrative allocation of spectrum is restricted to ‘Certain satellite-based services’ and not all satellite-based services. It covers GMPCS and MSS in L and S bands.
5. **Thus, the methodology of administrative allocation to Mobile Satellite Service (MSS) is restricted only w.r.t. L and S bands. All other bands to be used for MSS are not part of this Schedule and hence, outside the ambit of administrative assignments.**
6. Further, **GMPCS authorisation is related to Mobile services and same was the scope of GMPCS authorisation when the legislation was laid before the Parliament for approval. Therefore, the administrative assignment of spectrum to be given under GMPCS authorisation, is only for Mobile satellite services and it cannot be for Fixed Satellite services. Changing the scope of GMPCS authorisation to cover FSS for the purpose of administrative allocation of the spectrum, would be against the provisions and intent of the Telecommunication Act 2023.**

D. Scope of GMPCS was restricted to MSS during enactment of the Telecommunications Act, 2023

1. The Unified License version dated 31.03.2023 stated the scope of the GMPCS license as below which clearly mentions only MSS as part of the GMPCS service:

2. Scope of the GMPCS Service: *Scope of this Authorization covers the following:*

*2.1 The licensee may provide, in its area of operation, **all types of mobile services**, including voice and non-voice messages, data services by establishing GMPCS Gateway utilizing any type*



of network equipment including circuit and/or packet switches. The licensee may also provide satellite-based data connectivity to the IoT devices/ Aggregator devices.

2.2 The Licensee shall establish Land Earth Station Gateway in India for the purpose of providing Global Mobile Personal Communication by Satellite (GMPCS) Service. GMPCS Service may be provided using one or more Satellite Systems provided that the Land Earth Station Gateway Switch is established separately in India for each Satellite System.

2. Further, the First Schedule on “Assignment of Spectrum through Administrative Process” of the Telecommunications Act, 2023 also stated as below and nowhere mentioned FSS and MSS as part of scope of GMPCS:

16. Certain satellite-based services such as: Teleports, Television channels, Direct To Home, Headend In The Sky, Digital Satellite News Gathering, Very Small Aperture Terminal, Global Mobile Personal Communication by Satellites, National Long Distance, International Long Distance, Mobile Satellite Service in L and S bands.

3. However, TRAI, under Chapter XI on Satellite-based Telecommunication Service Authorisation of its recent recommendations on the “Framework for Service Authorisations to be Granted Under the Telecommunications Act, 2023” dated 18.09.2024 states as below:

“3. Scope of service:

*(1) Broadly, the Authorised Entity may provide **Global Mobile Personal Communication by Satellite (GMPCS) Service using Mobile Satellite Services (MSS) and Fixed Satellite Services (FSS);** and VSAT-based Fixed Satellite Services (FSS). **Global Mobile Personal Communications by Satellite (GMPCS) system means “any satellite system (i.e. fixed or mobile, broad-band or narrow-band, global or regional, geo-stationary or non geo-stationary, existing or planned) providing telecommunication services directly to end users from a single or constellation of satellites”***”

4. **Considering all above, we submit that FSS was not part of the GMPCS service when the Telecommunications Act, 2023 was laid before the Parliament. Any inclusion of FSS or increment in the scope of GMPCS service made by the Authority in its recommendations, cannot bring the assignment of spectrum for FSS services under the administrative allocations prescribed under the First Schedule of the Telecommunications Act, 2023.**

E. Provisions of the Act

1. Considering assignment methodology being the key factor to ensure level playing field, we strongly urge the Authority to acknowledge auction as the only fair means to allocate spectrum for providing commercial services i.e. for reaching out to consumers.
2. Thus, we urge the Authority to also recommend to the DoT for carrying out a transparent and consultative review of the existing First Schedule of the Act and remove the point 16 thereto for ensuring level-playing field, which DoT has sought to be accounted for.

F. Relaxed terms for Allocation of Satellite related Spectrum

1. There have been various statements being made about satellite-based communication services, that they are in nascent stages and new technologies are to be supported OR it is complementary to the existing access mobile services OR it will be given in rural-remote areas helping rural/poor consumers.
2. **If the allocation methodology, pricing or any other terms & conditions of satellite related spectrum is influenced with above-stated welfare objectives then, it is extremely important to place suitable conditions and restrictions on the spectrum utilisation, so that the spectrum is utilised to fulfil the policy objectives and not to gain competitive advantages over other commercial services like mobile services being given by access service providers.**
3. **Some of these conditions in case of administrative spectrum pricing for satellite-based services (administratively allocated only in those cases where objective is to serve only those areas where terrestrial coverage from any TSP is not available and spectrum is allocated at nominal cost), are mentioned below:**
 - a. **The services through this spectrum can be utilised to serve remote and rural areas only, where terrestrial coverage from any TSP is not available/not feasible.**
 - b. **The services through this spectrum can only be provided under partnerships with the existing access service providers, and no customer will be acquired by the entity independently.**
 - c. **The spectrum allocation to be made only for 2 years to support the new technology for non-commercial communication services. For commercial communication services, no relaxations should be given and level playing field should be maintained with norms of spectrum allocation to access service providers.**

G. Spectrum Allocation Methodology and Pricing

1. As per the guidelines of Hon'ble SC, the natural resources, including spectrum, are to be allocated only via Auction process. As a result, all the TSPs are required to acquire access spectrum only via Auction process since 2012 and there is no administrative allocation for access spectrum. Over a period of time, TSPs have paid auction determined prices for acquiring spectrum through Auctions for setting up a network for offering the access services.
2. Considering above, to ensure a level playing field between the existing TSPs and any other player who can offer the similar set of services as the existing TSPs are offering should be subject to 'same service, same price'. Accordingly, the spectrum for satellite-based services shall be discovered through a widely accepted mechanism of auctions if it is to be used by the



spectrum holder for offering voice and data services to the end customers. For determining the reserve price, TRAI should recommend the prices for satellite spectrum considering the factors like spectral efficiency over the last auction prices of closest spectrum bands.

3. According to the point 16 of The First Schedule on “Assignment of Spectrum through Administrative Process” of the Telecommunications Act, 2023, the FSS and MSS services can be categorized on the basis of assignment methodology as below:

Sl. No.	Service Category	Spectrum Bands	Spectrum Assignment Methodology
1.	Mobile Satellite Services (GMPCS)	L and S Spectrum bands	Administrative
2.	Mobile Satellite Services (GMPCS)	Other Spectrum bands (including but not limited to Ku, Ka, V band) except L and S bands	Auction
3.	Fixed Satellite Services (Any authorisation)	All bands	Auction

4. **Therefore, spectrum in L and S bands and that too for MSS only, can be provided through administrative assignment. Rest all spectrum bands for MSS as well as for FSS have to be assigned through auction.**
5. **Exclusive or Shared Assignment and Geographic area**
 - a. **User links:** These should be assigned on exclusive basis at LSA level, to maintain level playing field.
 - b. **Feeder links:** These should also be assigned on exclusive basis at link level/Geographical area level. The concerned entities should be mandated to allow sharing to other licensees.
6. **Spectrum Valuation/Pricing - Allocation through Auction:**
 - a. To maintain level playing field and to ensure certainty in regulatory principles and policies, it is imperative that valuation exercise is done by TRAI for the spectrum for satellite communication services, as has been consistently being done in past more than a decade for IMT spectrum.
 - b. The Section 4(4) of The Telecommunications Act 2023, **provides for assignment of the spectrum through auction or on administrative basis. However, this Section does not provide any relaxation in terms of payment of market determined price for assignment of spectrum. The provision for pricing and payment of all the Spectrum is covered under section 4(3). Therefore, it is important to maintain level playing field and ensure that**



market determined price, at a LSA level, is taken for the Satellite related spectrum also, be it through auction or through administrative allocation (as per table given in point no. F above).

- c. Globally the Ku & Ka bands and L & S bands are generally used for providing satellite-based services. There is no historical auction data available for auction of these bands conducting comparative analysis involving auction-determined prices in India. For determining the prices for Ku & Ka bands, L & S bands and any other relevant band, as historically done in the past, factor of spectral efficiency of the spectrum in the other bands where prices have been determined basis the auctions (TRAI has consistently used 1800 MHz band prices for benchmarking valuation for other spectrum bands) vis-à-vis the spectrum in these band should be used.
 - d. **Hence, considering the above, the prices should be charged/determined on a per MHz basis at LSA level, linked to prices of the spectrum already auctioned and being used by the TSPs is an appropriate mechanism for determining pricing for satellite spectrum.**
 - e. Additionally, it is important to highlight that **in case satellite spectrum is allowed to offer voice, data or any connectivity services to the end customers, then such spectrum/operators should comply with all the relevant terms and conditions as applicable to existing TSPs including payment of License Fee and spectrum usage charges as a % of AGR, security conditions including Lawful Interception, KYC, Data Privacy, TRAI's Regulations and tariff orders, compliance to other conditions including for subscriber acquisition and servicing etc.**
 - f. We strongly urge that **the pricing for spectrum should be in correlation with the recent auction prices and should be on licensed service area wise basis only.**
 - g. **The auction methodology and all related modalities should remain same as is applicable for IMT spectrum auction.**
7. **Spectrum Valuation/Pricing - Administrative allocation (applicable only for L and S bands for MSS under GMPCS):**
- a. To maintain level playing field and to ensure certainty in regulatory principles and policies, it is imperative that the spectrum is allocated after payment of market related price. This would be akin to market determined price being paid by Government PSU for administrative allocation of spectrum i.e. without bidding in the auction.
 - b. For determining market price, valuation exercise should be done by TRAI for the spectrum for satellite communication services, as has been consistently being done in past more than a decade for IMT spectrum.



- c. **This valuation exercise should be based on spectral efficiency of a particular spectrum band as compared to an existing auctioned spectrum band (TRAI has consistently used 1800 MHz prices for benchmarking valuation for other spectrum bands).**
- d. **Also, the pricing for spectrum should be in correlation with the recent auction prices and should be on licensed service area wise basis only.**
- e. However, in case the Satellite based services are restricted only to the pre-defined and clearly demarcated geographical areas where the terrestrial services are not available and in partnerships with the existing access service providers, then appropriate AGR based charging may appear reasonable for spectrum allocation. However, such services should not result in direct competition with the existing access service provider in any manner.

H. New Technologies Supporting Complementary Satellite Based Services over IMT Spectrum

1. Globally, the technologies are evolving which are leading to convergence between various digital services like telecommunication, broadcasting, OTT etc. Similarly, even though space-based communication services may appear to be in relatively nascent stage, new technologies are shaping up globally, which will lead to convergence of terrestrial and space-based networks.
2. One of the examples is of an innovative technology being built for a space-based cellular broadband network. As per the website of the company, they are building the first and only space-based cellular broadband network to be accessible by standard smartphones. Also, said ultra-powerful network is being designed to provide connectivity at 4G/5G speeds everywhere on the planet – on land, at sea and in flight. Said technologies will provide benefit of directly connecting ordinary mobile phones (unmodified) to space-based cellular broadband satellite network.
3. Considering that these services will ride on the existing network infrastructure, existing end devices of consumers and be using the same spectrum which is already being utilized by the TSPs, we submit that such technologies will serve as an additional means to provide services in remote and rural areas and hence, will require support of enabling policies. As the IMT spectrum is acquired through auction and on market determined price, it should be clarified that the said spectrum can also be used for providing communication services through a mix of or through one of the terrestrial or satellite mediums.

In addition to above, we would like to submit our question-wise comments as follows, for the Authority's kind consideration:



Question-wise Comments

Q1. 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.

And

Q2. 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.

VIL Comments to Q1 and Q2.

1. Out of the bands referred by DoT through its earlier reference letter dated 16 Aug 2022, 28 GHz band is allocated for shared use between Mobile and FSS. In addition, this band was studied in WRC-19 with objective to protect applications of “Mobile Services” from any Interference from Satellite services. Hence this band shall not be allocated for Land E-SIM, which will make it impossible to share it with the Mobile Services.
2. In India, currently 13 GHz (12.750-13.250 GHz), 15 GHz (14.5-15.5 GHz), 18 GHz (17.7-19.7 GHz) and 21 GHz (21.2-23.6 GHz) bands are used for the assignment of frequencies for MWA carriers which serves as a backhaul to the terrestrial telecom network throughout the country. These frequencies cannot be allocated to other services as this would cause interference to the MWA services causing disruption to the existing terrestrial services of the TSP and will impact the QoS and availability of the services impacting millions of subscribers. These frequencies shall not be allocated for FSS without adequate protection to existing MWA services.
3. Hence the frequency band 10.7 – 12.75 GHz (Space to Earth) and 13.75 – 14.5 GHz (Earth to Space) seems to be best suited without impacting existing MWA services and future IMT services.
4. TSPs with UL access licenses has acquired spectrum through Auction for setting up a network for offering data and voice communication, messaging and Internet services, hence, it should be ensured to provide the level playing field between the existing Terrestrial Network Service Providers and the Satellite data & Internet service providers. Only fixed terminals shall be allowed to be served in far-flung remote unserved regions with mobility restrictions by Satellite service providers and should be governed by same set of rules as the Mobile Service Providers to ensure establish a level playing field with terrestrial access services.
5. 3GPP has defined following bands in L & S bands for MSS Satellite based communication:



3GPP Band	Uplink	Downlink	Duplex	3GPP Band
n256	1980 – 2010 MHz	2170 – 2200 MHz	FDD	S Band
n255	1626.5–1660.5 MHz	1525 – 1559 MHz	FDD	L Band
n254	1610-1626.5 MHz	2483.5 – 2500 MHz	FDD	LS Band
N253	1610-1626.5 MHz	1518 – 1525 MHz	FDD	ext L Band

These bands will be globally considered for MSS usage and may be considered for MSS operations in India.

**Q3. 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.**

VIL Comments to Q3.

To maintain level playing field, the validity of spectrum should be kept as 20 years. As noticed during the previous auctions, change in validity would impact the pricing and the payment to be made by the spectrum acquirer.

Q4. 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.

VIL Comments to Q4.

1. Since each satellite system shall require separate frequency assignment, every ITU filing can be treated as separate satellite system.
2. It will give DoT to carefully validate any such requirement effective Utilization by Service Providers before the allocation of spectrum for each satellite system to ensure maximal product use of spectrum.
3. However, the terms and conditions pricing, scope and methodology of Spectrum assignment should be governed as per law of land prevalent in India.

Q5. 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.**

VIL Comments to Q5.

1. Any spectrum allocation for satellite service shall ensure that the existing services operating in that band is protected. A well-established coordination system exists under the ITU RR framework where multiple types of satellite providers coexist in the same frequency band and deliver optimal outcomes and is found to be effective for most of the cases.
2. In case such a co-existence is not verified as part of ITU, then extensive studies shall be conducted to ensure the protection of existing service for co-existence of the services.

Q6. 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.

VIL Comments to Q6.

No comments.

Q7. 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.

And

Q8. 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.



VIL Comments to Q7 and Q8.

1. Any spectrum allocation for satellite service shall ensure that the existing services operating in that band is protected. Extensive studies shall be conducted to ensure the protection of existing service for co-existence of the services. Else it may lead to disruption and degradation of the existing services.
2. In the unlikely 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.
3. The criterion can be arrived only after the arriving at the outcome of such co-existence studies and after discussion with all the relevant stakeholders.

Q9. 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 along with international practice in this regard.

VIL Comments to Q9.

No comments.

Q10. 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 –

- (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 alongwith international practice in this regard.**

VIL Comments to Q10.

1. Spectrum being a finite and valuable resource, every spectrum holder should be obliged equally to discharge its duty to the society at large.
2. **Being a competing service, roll-out obligations as mandated for the spectrum assigned to the access communication service providers, should also be mandated for the spectrum intended to be used for space-based communication services. Same roll-out obligations for all the communication service providers will also ensure level-playing field in the ecosystem. However,**



in case such spectrum is utilized to serve only those areas where terrestrial coverage from any TSP is not available the roll-out obligations may be relaxed.

Q11. 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 -

- (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?**
- 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.**

VIL Comments to Q11.

In our view, to ensure level playing field existing spectrum surrender norms should be followed for satellite-based spectrum in case acquired through auction.

Q12. Whether there is a need to prescribe timelines for processing the applications for the assignment of frequency 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.**

VIL Comments to Q12.

For the cases of administrative assignment of frequency spectrum, the applications should be put up for public information on DoT's website, with a 3 months' advance information.

Q13. 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.**

VIL Comments to Q13.

We request that all the comments given in the Preface above, should be considered as part of comments to this question.

Q14. 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.

And

Q15. 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.

And

Q16. 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.

And

Q17. 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.

And

Q18. 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.

And

Q19. 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.

And

Q20. 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.

And

Q21. 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.

VIL Comments to Q14 to Q21.

1. Allocation Methodology:

- a. As per the guidelines of Hon'ble SC, the natural resources, including spectrum, are to be allocated only via Auction process. As a result, all the TSPs are required to acquire access spectrum only via Auction process since 2012 and there is no administrative allocation for access spectrum. Over a period of time, TSPs have paid auction determined prices for acquiring spectrum through Auctions for setting up a network for offering the access services.



- b. According to the point 16 of The First Schedule on “Assignment of Spectrum through Administrative Process” of the Telecommunications Act, 2023, the FSS and MSS services can be categorized on the basis of assignment methodology as below:

Sl. No.	Service Category	Spectrum Bands	Spectrum Assignment Methodology
1.	Mobile Satellite Services (GMPCS)	L and S Spectrum bands	Administrative
2.	Mobile Satellite Services (GMPCS)	Other Spectrum bands (including but not limited to Ku, Ka, V band) except L and S bands	Auction
3.	Fixed Satellite Services (Any authorisation)	All bands	Auction

2. **Therefore, spectrum in L and S bands and that too for MSS only, can be provided through administrative assignment. Rest all spectrum bands for MSS as well as for FSS have to be assigned through auction.**
3. **Exclusive or Shared Assignment and Geographic area**
- a. **User links:** These should be assigned on exclusive basis at LSA level, to maintain level playing field.
- b. **Feeder links:** These should also be assigned on exclusive basis at link level/Geographical area level. The concerned entities should be mandated to allow sharing to other licensees.
4. **Spectrum Valuation/Pricing - Allocation through Auction:**
- a. To maintain level playing field and to ensure certainty in regulatory principles and policies, it is imperative that valuation exercise is done by TRAI for the spectrum for satellite communication services, as has been consistently being done in past more than a decade for IMT spectrum.
- b. The Section 4(4) of The Telecommunications Act 2023, **provides for assignment of the spectrum through auction or on administrative basis. However, this Section does not provide any relaxation in terms of payment of market determined price for assignment of spectrum. The provision for pricing and payment of all the Spectrum is covered under section 4(3). Therefore, it is important to maintain level playing field and ensure that market determined price, at a LSA level, is taken for the Satellite related spectrum also, be it through auction or through administrative allocation (as per table given in point no. F above).**



- c. Globally the Ku & Ka bands and L & S bands are generally used for providing satellite-based services. There is no historical auction data available for these bands for conducting comparative analysis involving auction-determined prices in India. For determining the prices for Ku & Ka bands, L & S bands and any other relevant band, as historically done in the past, factor of spectral efficiency of the spectrum in the other bands where prices have been determined basis the auctions (TRAI has consistently used 1800 MHz band prices for benchmarking valuation for other spectrum bands) vis-à-vis the spectrum in these band should be used.
 - d. **Hence, considering the above, the prices should be charged/determined on a per MHz basis at LSA level, linked to prices of the spectrum already auctioned and being used by the TSPs is an appropriate mechanism for determining pricing for satellite spectrum.**
 - e. Additionally, it is important to highlight that **in case satellite spectrum is allowed to offer voice, data or any connectivity services to the end customers, then such spectrum/operators should comply with all the relevant terms and conditions as applicable to existing TSPs including payment of License Fee and spectrum usage charges as a % of AGR, compliance to other conditions including for subscriber acquisition and servicing etc.**
 - f. **We strongly urge that the pricing for spectrum should be in correlation with the recent auction prices and should be on licensed service area wise basis only. The auction methodology and all related modalities should remain same as is applicable for IMT spectrum auction.**
5. **Spectrum Valuation/Pricing - Administrative allocation (applicable only for L and S bands for MSS under GMPCS):**
- a. In case it is decided to allocate the spectrum for satellite-based services on an administrative basis, the price at which such allocation is made shall be determined in such a manner that a level playing field is maintained between the existing Terrestrial Network Service Providers and the Satellite data & Internet service providers, i.e. after payment of market determined price.
 - b. This would be akin to market determined price being paid by Government PSU for administrative allocation of spectrum i.e. without bidding in the auction.
 - c. For determining market price, valuation exercise should be done by TRAI for the spectrum for satellite communication services, as has been consistently being done in past more than a decade for IMT spectrum.
 - d. **This valuation exercise should be based on spectral efficiency of a particular spectrum band as compared to an existing auctioned spectrum band (TRAI has consistently used 1800 MHz prices for benchmarking valuation for other spectrum bands).**



- e. **Also, the pricing for spectrum should be in correlation with the recent auction prices and should be on licensed service area wise basis only.**

- f. However, in case the Satellite based services are restricted only to the pre-defined and clearly demarcated geographical areas where the terrestrial services are not available and in partnerships with the existing access service providers, then appropriate AGR based charging may appear reasonable for spectrum allocation. However, such services should not result in direct competition with the existing access service provider in any manner.

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