JIO SATELLITE COMMUNICATIONS LIMITED

CIN: U72900GJ2021PLC126518

JSCL/TRAI/2023-24/007

20th June 2023

To,

Shri Akhilesh Kumar Trivedi,

Advisor (Networks, Spectrum and Licensing)

Telecom Regulatory Authority of India

Mahanagar Doorsanchar Bhawan

Jawaharlal Nehru Marg, New Delhi - 110002

Subject: **JSCL's Counter Comments on TRAI's Consultation Paper on "Assignment of Spectrum for Space-based Communication Services" dated 06th April 2023.**

Dear Sir,

Please find enclosed the counter comments of Jio Satellite Communications Limited (JSCL) on the consultation paper "Assignment of Spectrum for Space-based Communication Services" dated 06th April 2023.

Thanking you,

Yours Sincerely,

For **Jio Satellite Communications Limited**

Dr. Ravi P. Gandhi

Authorized Signatory

Enclosure: As above

Jio Satellite Communications Limited's counter comments on TRAI's consultation paper on "Assignment of Spectrum for Space-based Communication Services" (Consultation Paper No. 6/2023 dated 06th April 2023)

Preface

1. Jio Satellite Communications Limited (JSCL) is a wholly owned subsidiary of Jio Platforms Limited (JPL). JSCL is a holder of Unified License (GMPCS, NLD and VSAT Authorizations) and plans to offer satellite-based communication services in the country using both **GSO and NGSO** satellites.

2. JSCL will set up the required infrastructure to deliver connectivity to both carriers and customers. For offering services, we would be using the following frequencies in Ka & Ku bands and would be interested in acquiring the right to use the frequencies in these bands through upcoming auctions.

Geostationary Orbit (GSO) Satellite- using SES-12		
Equipment	**Uplink**	**Downlink**
Gateway Terminal (Ka Band)	27.5 - 30 GHz	17.7 - 20.2 GHz
User Terminal (Ku Band)	14 - 14.5 GHz	10.7 - 11.7 GHz
Non-Geostationary Orbit (NGSO) Satellite- using SES O3B		
Gateway Terminal (Ka Band)	27.5 - 30 GHz	17.7 - 20.2 GHz
User Terminal (Ka Band)	27.5 - 30 GHz	17.7 - 20.2 GHz

3. We are grateful to the Authority for giving us an opportunity to share our views on the ongoing consultation process on auction-based assignment of spectrum for space-based communication services.

4. At the very outset, we submit that **JSCL supports an auction-based process for spectrum assignment for space-based communication services**. Auction based assignment provides equal opportunity to all service providers and brings requisite regulatory certainty and predictability by being a legally sound assignment mechanism.

5. Regulatory certainty and predictability protect the investments and are instrumental in bringing in additional investments in the sector. On the other hand, administrative assignment is uncertain**, anti-new-entrant, and unpredictable due to its 'first come, first serve' nature and legal untenability**

due to the Supreme Court judgement in the 2G case. Therefore, we submit that only an auction-based spectrum assignment mechanism should be implemented for space based communication services.

6. We have gone through the responses submitted by the stakeholders to the Consultation Paper on "Assignment of Spectrum for Space-based Communication Services" dated 06th April 2023 and feel that there is a need to clarify certain misleading arguments being made by certain stakeholders. Our issue wise response is as below.

I. Stakeholder's view: Spectrum auction is not feasible for space-based communication services.

JSCL Submissions:

1. At the outset, it is submitted that this debate surrounding the feasibility of spectrum auction for space-based communication services, is irrelevant. This is because the issue is already settled by the Hon'ble Supreme Court of India and DoT has acknowledged and accepted this decision, given that there is no reference of recommendations on non-auction-based spectrum assignment in the DoT letters shared with the consultation paper.

2. Thus, the focus of the industry should be on finding and deriving an optimum auction model for the alienation of spectrum resources in a transparent way, instead of over-analysing the feasibility of auction. Additionally, the arguments presented against the auctions lack substance and rely on vague statements and concepts such as ***'nobody has done it', 'spectrum is shared resource', 'exclusive assignment of spectrum is not feasible' 'ITU has already allocated', 'auction is technically not possible'*** *etc.*

3. It is submitted that all of these arguments are incorrect due to the following reasons :

   a. Spectrum for space based communication services is currently assigned administratively but on exclusive basis.

   The misconception that needs to be dispelled is that stakeholders are unaware of the fact that current spectrum assignments for satellite services are not inherently a shared resource since it follows the principle of exclusive spectrum assignment. Thus, it is crucial to debunk this misconception.

A thorough analysis of the current assignments awarded to different DTH, Teleport, and VSAT service providers reveals that each service provider has been assigned exclusive frequencies at various orbital positions/angular sector. This assignment guarantees exclusivity for each service provider. We have provided more details on this in section II of this response.

b. Many stakeholders are keen to get spectrum assigned to them in a non-transparent first cum first serve method and at non-market discovered prices.

The underlying intent behind continuous demand for administrative assignment of spectrum for satellite spectrum is their desire to obtain the spectrum against the settled law and at the cost of transparency in the assignment of scarce resource. Such intent is probably to get the spectrum at meagre revenue share without making an actual financial commitment of upfront payment and overall financial and rollout commitment. This reflects the non-seriousness of the business plan which some of these stakeholders are pursuing. We request the Authority to ignore such requests and instead focus on national goals and policy objectives to maximize public good while assigning the scarce national resource.

c. ITU does not assign any spectrum:

The ITU Radio Regulations do not impinge upon the sovereign right of countries to assign spectrum. The ITU does not prescribe, leave alone mandate, a methodology for assigning spectrum. Instead, it focuses on interference management and requires the member states to ensure that there is no harmful interference to services provided by stations in other countries. The only assignments done by ITU, pertain to orbital slots and this can be considered while designing the auction model, if required.

d. Indian law on the assignment of spectrum is very clear:

Hon'ble Supreme Court, in its landmark 2G judgment, has laid the law governing the spectrum assignment in India for communication networks. The law explicitly and unequivocally establishes the supremacy of auction for the assignment of spectrum for telecom networks. Thus, any re-agitation of this issue and reinterpretation/misinterpretation of the Hon'ble Supreme Court judgment as well as its response to presidential reference should not

be considered or accepted in the current consultation process. Furthermore, the law does not differentiate between terrestrial or satellite spectrum.

Moreover, as we will explain in this response, spectrum assignments for space-based communication services are inherently exclusive in nature. Therefore, they are subject to the legal position set forth by the Hon'ble Supreme Court in the 2G case.

It appears that the interpretation of stakeholders, who have opposed auctions, may have been influenced by their narrow interpretation of exclusive assignment and their interest in acquiring spectrum without paying the market-determined price through an open and transparent process. According to our understanding from media reports, the Learned Attorney General has also recommended that an auction is the only suitable method for spectrum allocation in cases where there is a demand for the limited resource.

e. Their arguments have not factored in the technological advancement:

The majority have stakeholders have ignored the technological advancement, new standards, research, and development of the global eco-system in their response and limited their comments with the assumption of an age-old GSO-based system.

While the stakeholders have very strongly emphasized on precedence, but they have failed to recognize that the modern satellite communication, especially LEO and MEO based communications mobile, fixed and nomadic services, which are currently under discussion, are not covered in the **precedence** quoted by the majority of stakeholders. Further, they have specifically ignored the successful auction of spectrum for satellite/NTN based network recently by **Thailand and Saudi Arab.**

It is ironic that the majority of respondents, while stating the benefits and broadband growth through LEO and MEO satellites have quoted the precedence related to GEO satellite and that too erroneously.

In fact, 3GPP standards in Release 17 enable seamless roaming between satellite and terrestrial networks while providing 4G, 5G, and NB-IoT services through space and the services provided through the satellite will be in direct competition with the terrestrial networks. As a result, any

application of the outdated policy used for administrative assignment of spectrum for GSO, is no longer a prudent method of assignment of spectrum.

f. Incumbent's fear of opening the market to new entrants

Another reason behind this stance is the incumbent's intention to curtail the entry of new players and strangulate the market by proposing the administrative assignment of the spectrum on the basis of the sequence of assignment of orbital slots by ITU on first cum first serve basis.

ITU does not follow an open and transparent auction methodology for allotment of orbital slot/altitude for GSO/NGSO and it is done on ***first come first serve*** basis. If one agrees with their argument and relies on the administrative assignment of the spectrum, basis the sequence in which the satellite received their orbital slot from ITU, then the whole process of assignment of the spectrum will be reduced to the *first come, first serve methodology* and that too where such queue will not be decided by Government of India.

It appears that the argument suggesting that India should assign spectrum frequencies to incumbent multinational players, on the basis of their priority set in ITU filing, without affording new entrants an opportunity to acquire spectrum through auctions is driven by the desire to maintain space-based communications as an exclusive club of foreign multinational and will defeat the very purpose of opening the space sector for private participation.

g. Conflicting claims, limited/rural/remote area usage for the purpose of obtaining spectrum without paying market price:

Many arguments are made to misrepresent the satellite services as a complementary service and not having the capability to compete with terrestrial services. This contradicts the aspirations expressed by numerous satellite service providers who are planning to offer services that are currently provided by terrestrial services.

Further, there are no legal restrictions on service providers in terms of providing the services competing with terrestrial services, and these enjoy

the benefit of having a permission to provide these services Pan India in GMPCS/VSAT authorization.

The technological standards established by 3GPP also acknowledge the involvement of satellite networks in directly serving mobile customers on their devices. Numerous satellite-based service providers have already commenced trials and forged agreements with mobile network operators to deliver services directly to their customers through satellites. Furthermore, several satellite-based service providers have begun offering broadband services directly to end customers.

Therefore, notwithstanding the legal position in India that spectrum can be assigned only through auctions, no special concessions are warranted for the satellite based services.

4. **In light of the above, it is evident that the arguments against auction are bereft of any sound footing and should be ignored by the Authority.**

II. Stakeholder's view: Spectrum for space-based services is a shared resource and exclusive assignment is not possible.

JSCL Submissions:

1. Assignment and shared resources are an oxymoron. If a resource can be used by a large number of operators in a shared mode, then there is no need of assignment. A general declaration of delicensing of such spectrum should be sufficient. However, that is not the case in satellite communication. Every transmitter/receiver in space based communication network works on a specific frequency which cannot be used by others **in the same geography** and **at the same look angle**. Therefore, the spectrum has to be assigned exclusively, though, such exclusivity may differ and may include the look angle as additional dimensions as compared to the commonly understood exclusivity in the terrestrial network in which different frequencies/spectrum is assigned exclusively in a given geographic area while the same spectrum can be used in a different geographic area.

2. The exclusivity of frequencies for GSO can be done on a band segmentation basis on both dimensions i.e. geographic area and the angular slot for gateways, but for the GSO user terminal, such exclusivity is possible only on the basis of the angular slot.

3. In the case of NGSO constellations, there would be hundreds of thousands of fast moving satellites belonging to a large number of entities from various diverse countries- 7 to 10 entities have already initiated plans and are working and various parts of the world. Because of the enormity of a number of fast moving satellites, the angular exclusivity/separation for the user terminals installed by a large number of service providers would be nearly impossible. Therefore, the spectrum assignment has to be done only on the basis of frequencies.

4. The exclusive assignment is the only way for assigning interference free spectrum for space-based communication services. The assignment design only needs to accommodate various types of exclusivity for User Terminals of GSO, NGSO and gateways.

5. There is no doubt that the spectrum assignment has to be done. Further, there cannot be any assignment without exclusivity. So, the only surviving question is the methodology of such an assignment. Should it be an auction or a first come, first serve based administrative methodology? The Hon'ble Supreme Court has already decided this question and therefore, the spectrum should be assigned through auction only.

6. As mentioned above, we should also like to demonstrate with the help of data that the existing spectrum assignments for satellite services (such as such as DTH, Teleports, VSAT etc.) are inherently exclusive assignments. In case of GSO satellites, the exclusive use of spectrum is ensured by assigning different frequencies to different satellites placed in the same angular sector. The optimal range of orbital slots for India spans from 45°E to 115°E, encompassing a total arc of 70°. With a 3-degree orbital gap, it is possible to create a total of **23 angular sectors**, denoted from **A: 45°-48° to W: 111°-114°**.

7. In the case of Teleport, the details in the table below clearly show this exclusivity by assigning separate frequencies within the same orbital slot:-

S.No.	Orbital slot	Angular Sector*	Frequency (MHz)	Satellite	STV No	Teleport Service Provider
1	105.5°	U	6347.00 - 4122.00	ASIASET-7	2 - STV-124/01	Tata Communications Ltd
2	105.5°	U	6061.00 - NA	ASIASET-7	1 - STV-63/01	Ortel Communications Ltd/.
3	105.5°	U	6132.00 - NA	ASIASET-7	STV-89/01	Planetcast Media Services Limited

Angular Sector 'U' denotes **105°-108°*

8. The two satellites in different angular sectors can use the same frequency. However, such assignment cannot be termed as shared use of spectrum; it is akin to terrestrial services in which the same frequency can be assigned to two service providers in different LSAs.

S.No.	Orbital Slot	Angular Sector*	Spectrum (GHz)	Satellite	DTH Service Provider
1	83.0°	M	11050 H	G-Sat 30	Tata Play
2	88.0°	O	11050 H	ST 2	D2H (Videocon)

**Angular Sector 'M' denotes 81°-84° & 'O' denotes 87°-90°*

9. Thus, even in so called shared use of spectrum under administrative assignment, there is exclusivity in spectrum assignment where different frequencies are assigned exclusively to service providers in the same angular sector exhibiting the same approach of spectrum assignments as prevalent in a circle for terrestrial services. Therefore, the theory of shared/non-exclusive assignment propounded by some stakeholders is completely wrong.

10. Any discerning observer of spectrum assignment for space-based communications can figure out that in all prevailing modes of assignments, exclusivity is maintained without fail, because a non-exclusive assignment is actually no assignment like delicensed spectrum and will create chaos and indiscriminate use leading to depletion of spectrum usability for carrier grade services akin to spectrum delicensing.

11. An example of exclusive assignment through an administrative process can be seen in FCC rules for the NGSO-FSS system (FCC 23-29). The exclusivity is provided through priority in processing rounds and any subsequently approved NGSO FSS systems are required to coordinate with and protect the communication systems assigned rights during the earlier round of assignment. Thus, effectively, the approved set of NGSO operators utilize the same frequencies through self-coordination/distribution, which is another way of describing dividing the entire spectrum in that band for exclusive use between the approved operators. To add to this, FCC also provides for a default spectrum split process in case of failure to coordinate. It is important to mention here that the number of service providers in one round is limited to four. If the shared spectrum could be used by everyone, then the need to limit the number of operators would not have arisen.

12. The moot point that emerges from FCC implementation is that all the claims of all operators sharing and using the same spectrum simultaneously are false and appear to emerge from a narrow interpretation of exclusivity. This exclusivity is further substantiated by the FCC mandated exclusivity for the club of four operators as well as a failsafe mechanism to divide the spectrum. This methodology again raises the question on how the four operators are selected. Is it through a ***transparent auction process*** or on the basis of ***first cum, first serve?***

13. To reiterate, **the above clearly establishes that the exclusive assignment of frequencies at the level of angular sector or exclusivity of frequencies to a small group of operators by some countries cannot be termed as an assignment of non-exclusive/shared spectrum by any stretch of the imagination**.

14. **In both India and other countries, the spectrum for space-based services follows an exclusivity principle in assignment. Hence, the only surviving question pertains is about the methodology of assigning this scarce resource. Should it be accomplished administratively or through an open and transparent auction process?**

15. Therefore, we submit that the **Authority should consider only exclusive assignment through auction and all opposing views should be summarily rejected.** Further, if at all the international examples are to be examined, then it would be more appropriate to use the **latest examples of auction in the case of Saudi Arabia and Thailand.** The successful spectrum auction model implemented in Thailand & Saudi Arabia can be a good reference for India without having to wait for a majority of countries to adopt the same methodology. **These examples serve as evidence that these countries not only succeeded in determining the market value of this spectrum but were also able to monetize the inherent demand for spectrum for space-based communication services, with bids often crossing the reserve price.**

    It is also relevant to mention here that the argument of stakeholders, claiming that the auction of an orbital slot in countries like Thailand cannot be equated with the assignment of spectrum, holds no significance. In reality, the auction of an orbital slot inherently includes the right to use the spectrum within that particular angular sector in which the orbital slot lies, enabling the provision of satellite-based services. Conducting an auction solely for the orbital slot without including the spectrum would be devoid of significance. In reality, the auction involves the spectrum within the angular sectors where the orbital slot

is located. Hence, it is important not to conflate this spectrum auction with an auction focused solely on the orbital slot. Thus, **it is essential to recognize that the auction of an orbital slot encompasses the assignment of spectrum and its associated usage rights**.

III. **Stakeholder's view: Auctions dissuades sharing and creates intermediaries.**

JSCL Submissions:

1. Sharing of spectrum for terrestrial networks, based on a direct agreement between the operators, has been available in India for over five years now. Many operators have attempted it and have successfully leveraged the same to enhance their network capacities for short term and long-term basis. In all these cases, the spectrum being shared was exclusively assigned spectrum, obtained through auctions. We do not see any difference in for space-based communication networks as, at the basic level, these are types of wireless networks.

2. Thus, if the spectrum can be shared in one technology, then why not in another? Further, under the prevailing sharing guidelines for terrestrial networks, the efficiencies are achieved by mutual negotiations, so it is difficult to understand as to how auctioned spectrum sharing will become untenable for space-based communication networks.

3. Further, the claim of creating intermediaries is bereft of **logic as it is highly unlikely that any business entity will buy and hoard spectrum only for the purpose of hoarding it and sharing it without any intention of utilizing it**. Nevertheless, even if someone wants to do this, the **minimum roll out requirement**s will ensure that this operator also has to build a network, while the **spectrum cap** will ensure that no one can buy excess spectrum. Thus, evidently, these charges are just a figment of imagination.

4. The argument that auction creates the rise of an intermediaries/gatekeepers is flawed, and we see that the administrative assignment would in fact result in the creation of gatekeepers. In the case of administrative assignment, an entity may acquire spectrum through preferential treatment or external influences, and subsequently become a gatekeeper by selectively sharing it with entities who actually require the spectrum. The Indian telecommunications sector has already experienced the negative consequences of administrative spectrum assignment between 2008-2012, which led to significant investment uncertainties. It took several years for the industry to stabilize and progress by

implementing a stable and transparent spectrum assignment regime through auctions.

5. **Hence, we submit that exclusive assignment of interference free spectrum through auctions would mitigate the risk of creating gatekeepers and would instead promote sharing, as it is more efficient and is market driven process.**

IV. **Stakeholder's view: Auctions will discourage investments and would bring uncertainty.**

JSCL Submissions:

1. This is another negative argument bereft of any analysis or logic. How can a process that is fair, transparent and provides equal opportunity and regulatory certainty, be negative for the investments? The facts point to the contrary. In India, the technological growth started with the spectrum auctions, and we are now the leading nation in new technology roll-outs.

2. The success of the terrestrial network, where the investor has the leverage to build a business case for 20 years with an assured exclusive spectrum, can be replicated in the space-based communication services by spectrum auctions. **This is the most predictable and investor friendly model, whereas on the other hand, the administrative assignment of spectrum is unreliable and unpredictable due to its 'first come, first serve' nature and legal untenability due to the Supreme Court judgment in the 2G case.**

3. The purpose of sovereign licensing is to grant market access, while auctions are designed to allocate sovereign resources such as spectrum. Hence, any entity wishing to enter the market in a country is required to comply with the laws of that land and cannot expect to obtain resources without adhering to the legal framework. India has firmly established itself as a prominent global leader in spectrum auctions for terrestrial services since 2010. The country's policy framework and innovative auction methodology have garnered widespread adoption by numerous countries worldwide, underscoring India's remarkable effectiveness and influential role in shaping international practices. The transparent and progressive regulatory policies of India have gained significant recognition on a global scale, further solidifying its position as a beacon of excellence in the telecommunications sector.

4. Under the auction-based regime, terrestrial services have experienced immense benefits and have attracted substantial investments, resulting in economies of

scale that have ultimately led to consumer prices reaching the most affordable levels. This auction-driven approach has created a favorable environment for terrestrial service providers, fostering competition and driving innovation in the telecommunications industry. As a result, consumers have been able to access high-quality services at increasingly affordable rates, further enhancing the accessibility and affordability of telecommunications in the market.

5. Furthermore, **the assignment of spectrum on an administrative basis to a limited number of selected entities using a first-come, first-served approach significantly increases the risk of these entities engaging in activities such as profiteering through the resale of their rights, anti-competitive behaviour, monopolistic practices, favouritism, and more.**

V. **Stakeholder's view: Auctions will discourage new entrants and start-ups due to high spectrum costs.**

JSCL Submissions:

1. This is another simulated argument on baseless grounds as auctions give a predictable and open path for market entry. The eligibility criteria are made available transparently and all eligible participants can acquire spectrum in the auctions by bidding suitably. In fact, the auction gives more opportunities to new entrants than vague and subjective criterion under the administrative assignment of spectrum. The worst of administrative assignment criteria is "first come, first served" that not alone lacks transparency and creates apprehensions around bias, but is also legally untenable.

2. Further, spectrum trading/leasing/sharing will be equally available to new entrants in auction-based model, thereby negating the argument that this will be unfriendly to new-entrant and start-ups.

VI. Stakeholder's view: No suitable model for auctioning the spectrum for user links (in bands such as C band, Ku band and Ka band) and for gateway links.

JSCL Submissions:

1. The mentioned perspective on the spectrum auction model is flawed and appears to be another attempt to misguide the consultation process. It is worth noting that countries such as Thailand, Saudi Arabia, Brazil, and the USA have been able to devise the auction models.

2. As mentioned earlier, in the case of GSO, the same frequency can be utilized by satellites positioned in different angular sectors. Therefore, the auction should be conducted for each angular sector. Bidders can place their bids for frequencies within a specific angular sector, regardless of whether the satellite is already positioned or will be positioned in the future in an orbital slot within that sector.

3. In the case of NGSO, the entire spectrum in a band needs to be divided into blocks, and these blocks should be auctioned for exclusive assignment. Once assigned, the successful bidders will have the freedom to trade, lease, or share the spectrum with other service providers.

4. For Gateway locations, the spectrum can be auctioned for use within limited geographical zones. Within these zones, the successful bidder shall have the right to use the entire spectrum in a band for gateway links.

5. To reiterate, it is essential to recognize that both in satellite and terrestrial networks, **the term "protection" implies the notion of exclusivity, while "assignment" refers to the exclusive right to utilize a specific set of frequencies in a given location**. This exclusivity can be applied in various scenarios, such as (i) at the circle level in terrestrial networks, (ii) Separate frequencies in nationwide for NGSO user links, (iii) within an angular sector in space for GSO user link, (iv) within exclusion zones for gateways/feeder links, (v) on a link-by-link basis between any two points, and so on.

6. Furthermore, we reiterate that the exclusivity of frequencies within an angular sector or the exclusivity of frequencies allocated to an operator by certain countries cannot be considered as the assignment of non-exclusive or shared spectrum under any circumstances.

VII. **Stakeholder's view: Role of ITU in coordinating and assigning orbital resources and consequent spectrum constraints.**

JSCL Submissions:

The ITU has no role in assigning spectrum, its role in this context revolves around the allocation of orbital slots; equitable access; global harmonization of frequency bands and interference management framework. We do not see any reason how this prevents any service provider from bidding for suitable spectrum for its orbital slot assigned by ITU.

VIII. Stakeholder's view: Satellite has international encumbrances and can render the operations infeasible in case of not being able to acquire same spectrum in auction.

JSCL Submissions:

This argument will have no place in an exclusive assignment scenario with enabling policies on spectrum sharing, trading and leasing. The service provider will have sufficient opportunity to acquire a preferred slot even if not successful in one auction.

IX. Stakeholder's view: Exclusive reservation of 27.5-29.5 GHz band for exclusive use of satellite based services.

JSCL Submissions:

1. In the fast-evolving technological paradigm, flexible use of spectrum, where the spectrum can be utilized with the best-suited and most feasible technology available at a location in an adaptive manner, is a possibility and should be leveraged.

2. Indian spectrum management regime has evolved to permit technology neutral use of spectrum in terrestrial networks for many years now, and by permitting flexible use of spectrum in bands useful for both terrestrial and satellite-based networks, the Government would be only extending the existing policy for better utilization of spectrum.

3. Therefore, we submit that there should be no service based exclusive reservation of spectrum bands. We submit that spectrum should be offered for flexible use. It is no secret that the mmWave band spectrum has multi-faced usage and can be used by both terrestrial as well as satellite networks, thus for optimum utilization and price discovery, this band should be offered for flexible use.