

PMSL/TRAI/Comments/Assignment of Spectrum/2023  
June 1, 2023

To

The Advisor (Networks, Spectrum and Licensing),  
Telecom Regulatory Authority of India  
Mahanagar Doorsanchar Bhawan,  
J.L.Nehru Marg, Old Minto Road,  
**New Delhi - 110002.**

**Kind Attention: Shri Akhilesh Kumar Trivedi.**

**Ref.: TRAI Consultation Paper No. 6/2023**

Dear Sir,

We are thankful to TRAI for providing an opportunity to the stakeholders by seeking their feedback / comments on the “**Assignment of Spectrum for Space-based Communication Services**”.

On behalf of Planetcast Media Services Ltd. (“PMSL”), please find attached herewith our comments on the selected questions under heading – “**Assignment of Spectrum for Space-based Communication Services**”.

Hope you will find the same in order.

Thanking you,

Yours faithfully,  
For PLANETCAST MEDIA SERVICES LTD.

  
**(KARUNESH CHADDHA)**  
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**Point wise reply on Consultation Paper**  
**On**  
**“Assignment of Spectrum for Space-based Communication Services”**



TRAI Questionnaires	PMSL Remarks
<p>Q1. For space based communication services, what are the appropriate frequency bands for (a) gateway links and (b) user links, that should be considered under this consultation process for different types of licensed telecommunications and broadcasting services? Kindly justify your response with relevant details.</p>	<p>Satellite Communication are a crucial part of any country's telecommunication infrastructure, providing internet and broadband connections countrywide, connecting urban and rural areas. Satellites also provide TV distribution, including DTH (direct-to-home), HITS, cable TV head-end feeds and satellite news gathering (SNG /DSNG) and video distribution links between various news studios, domestically and internationally. Satellite communications also have become an integral part of the IMT ecosystem, and for providing 5G applications such as IoT &amp; M2M connections. Satellite communications is very important for dissemination of news &amp; information to its population for any country since its Inception.</p> <p>Commonly frequency bands used by communication satellites are C, Ku and Ka-band, earth stations use directional antennas that enables reception of one satellite while efficiently discriminating signals from satellites at other orbit locations. This means that at the same location on ground, signals from a various satellite can be received at the same frequency. Compatibility between all these satellite networks is governed by ITU regulatory provisions. ITU coordinates the satellite frequency for GLOBAL usage.</p> <p>In India to be competitive in telecommunications infrastructure, it is crucial to ensure continued competitive satellite offerings and enable use of the capacity to a large number of satellites to meet the forthcoming needs in an economic and efficient manner. In view of the above, it is important that multiple users can use the same scarce frequency resources with multiple satellite networks at the same location. Providing exclusive rights to one user and/or one satellite network for a given frequency band in an area would bring monopoly / dominant use of satellite resources in the Indian telecommunication infrastructure.</p> <p>To the best of our knowledge, no other country has allocated frequency resources for space-based communications through an auctioning process and those few that have tried have failed for the same reasons.</p> <p>The Indian authorities should not put this Indian satellite / communication Industry at risk without taking cognizance of international precedents and the learnings from other countries. There is no other country on the globe that has actually auctioned satellite frequency assignments and succeeded in that..</p>

			<p>Auction of satellite spectrum would only create problem for small satellite users as there is a possibility of hoarding of satellite spectrum by few wealthy people / companies with deep pockets and they can be impediment to the smaller companies &amp; also to the National Security in the long run. Auctioning of satellite spectrum is not in the Interest of public, it will lead to artificial scarcity of satellite bandwidth. This will raise the prospect of a few wealthy players grabbing huge blocks of spectrum &amp; This would be disastrous in the media industry, where plurality of voices is the goal. Consumer welfare would also be greatly reduced. Therefore, granting exclusive rights to one user and/or one satellite network through auctioning is strongly inadvisable. Auctions would also be anti-competitive.</p>			
<p>Q2. What quantum of spectrum for (a) gateway links and (b) user links in the appropriate frequency bands is required to meet the demand of space based communication services? Information on present demand and likely demand after about five years may kindly be provided in two separate tables as per the proforma given below:</p>			<p>Spectrum requirement for gateway links and user links will depend on its application and customer base etc. keeping in mind that each link consist of set of uplink and a downlink frequencies. In respect of frequency range, satellite users typically will lease capacity in satellite transponders that are available for lease. The actual frequency therefore may fall anywhere within the frequency range of the satellites.</p>			
Type of service	Name of the satellite system	Type of satellite (GSO/LEO/MEO)	Frequency range and quantum of spectrum required			
			User Link (Earth to space UL)	User Link (Space to Earth DL)	Gateway Link (Earth to space UL)	Gateway Link (Space to Earth DL)



Any other relevant service (please specify)										
Q3. Whether there is any practical limit on the number of Non Geo Stationary Orbit (NGSO) satellite systems in Low Earth Orbit (LEO) and Medium Earth Orbit (MEO), which can work in a coordinated manner on an equitable basis using the same frequency range? Kindly justify your response.	PMSL is presently a GSO satellite user ONLY, and expresses no view on this.									
Q4. For space based communication services, whether frequency spectrum in higher bands such as C band, Ku band and Ka band, should be assigned to licensees on an exclusive basis? Kindly justify your response. Do you foresee any challenges due to exclusive assignment? If yes, in what manner can the challenges be overcome? Kindly elaborate the challenges and the ways to overcome them.	The C, Ku, and Ka-band spectrum in India is currently shared by multiple satellite users and from various locations for telecommunications infrastructure. India needs more users to share this spectrum to meet its development goals. Assigning exclusive spectrum portions is strictly not recommended, given the current usage and the objective of expanding the infrastructure. ISRO / DOS also offers the same spectrum for multiple satellite networks / uses across footprint. India has the authority to determine spectrum and licensing laws, coordination procedures, and landing rights policies for satellite networks. However, it is very important to enable multiple users and networks to access the satellite spectrum in a given geography.									
Q5. In case it is decided to assign spectrum in higher frequency bands such as C band, Ku band and Ka band for space based communication services to licensees on an exclusive basis,  (a) What should be the block size, minimum number of blocks for bidding and spectrum cap per bidder? Response may be provided separately for each spectrum band.  (b) Whether intra-band sharing of frequency spectrum with other satellite	Auctioning C-, Ku- and/or Ka-band satellite spectrum to one user on an exclusive basis would lead to an adverse impact on India's satellite communication ecosystem and we therefore hereby strongly advise against it.  PMSL is of the view that the satellite spectrum should continue to be allocated on administrative basis only, as per current practice. However, it is further suggested to reduce the Per MHz spectrum charges from existing rates to INR 10000/- per MHz / Per Annum for Teleport / DSNG / SNG/ HITS / DTH etc.									

<p>communication service providers holding spectrum upto the prescribed spectrum cap, needs to be mandated?</p> <p>(c) Whether a framework for mandatory spectrum sharing needs to be prescribed? If yes, kindly suggest a broad framework and the elements to be included in the guidelines.</p> <p>(d) Any other suggestions to ensure that that the satellite communication ecosystem is not adversely impacted due to exclusive spectrum assignment, may kindly be made with detailed justification.</p> <p>Kindly justify your response.</p>	
<p>Q6. What provisions should be made applicable on any new entrant or any entity who could not acquire spectrum in the auction process/assignment cycle?</p> <p>(a) Whether such entity should take part in the next auction/ assignment cycle after expiry of the validity period of the assigned spectrum? If yes, what should be the validity period of the auctioned/assigned spectrum?</p> <p>(b) Whether spectrum acquired through auction be permitted to be shared with any entity which does not hold spectrum/ or has not been successful in auction in the said band? If yes, what measures should be taken to ensure</p>	<p>PMSL is strongly against to the assigning access to C-, Ku- and/or Ka-band satellite spectrum on an exclusive basis. There should be no auction of satellite spectrum.</p> <p>a) Hypothetically, even if there is an auction of satellite spectrum it will be impossible to have all genuine users to participate in the auction since these users ranges from small users to large users.</p> <p>b) There would need to be a strict intervention for government to ensure fair pricing and avoid hoarding and opportunistic prising (profiteering).</p> <p>c) Clearly no new entrant can come into the field as all available satellite spectrum would already be auctioned away.</p> <p>The satellite spectrum ecosystem has developed in India, from last decades and came to this stage. There are several government agencies in India to control and look after coordinated satellite spectrum usage such as DOS, ISRO, NOCC, WPC. Moreover, prospective holder of satellite spectrum (via auction) will not able to control in that manner and it is not possible for any private entity to control several satellite</p>

<p>rationale of spectrum auction and to avoid adverse impact on the dynamics of the spectrum auction?</p> <p>(c) In case an auction based on exclusive assignment is held in a spectrum band, whether the same spectrum may again be put to auction after certain number of years to any new entrant including the entities which could not acquire spectrum in the previous auction? If yes,</p> <p>(i) After how many years the same spectrum band should be put to auction for the potential bidders?</p> <p>(ii) What should be the validity of spectrum for the first conducted auction in a band? Whether the validity period for the subsequent auctions in that band should be co-terminus with the validity period of the first held auction?</p> <p>Kindly justify your response.</p>	<p>networks which includes Defence / National Security / Other government strategic users, Public Sector Undertakings along with several private networks such as Television / Weather / VSAT / IFMC etc.</p> <p>Auctioning of satellite spectrum would lead to unnecessary hoarding of spectrum and loss of control by government regulators on satellite communications, it will further lead to unwanted litigation between the bigger users / smaller users and spectrum holders.</p>
<p>Q7. Whether any entity which acquired the satellite spectrum through auction/assignment should be permitted to trade and/or lease their partial or entire satellite spectrum holding to other eligible service licensees, including the licensees which do not hold any spectrum in the concerned spectrum band? If yes, what measures should be taken to ensure rationale of spectrum auction and to avoid adverse</p>	<p>PMSL is strongly against to the assigning access to C-, Ku- and/or Ka-band satellite spectrum on an exclusive basis. There should be no auction of satellite spectrum. Auction of satellite spectrum would only create problem for small satellite users as there is a possibility of hoarding of satellite spectrum by few wealthy people / companies with deep pockets and they can be nuisance to the smaller companies &amp; also to the National Security in the long run. Auctioning of satellite spectrum is not in the Interest of public, it will lead to artificial scarcity of satellite bandwidth. This may create a monopolistic environment in the country.</p>



<p>impact on the dynamics of the spectrum auction? Kindly justify your response.</p>	
<p>Q8. For the existing service licensees providing space-based communication services, whether there is a need to create enabling provisions for assignment of the currently held spectrum frequency range by them, such that if the service licensee is successful in acquiring required quantum of spectrum through auction/ assignment cycle in the relevant band, its services are not disrupted? If yes, what mechanism should be prescribed? Kindly justify your response.</p>	<p>PMSL is of the view that the satellite spectrum should continue to be allocated on administrative basis only, as per current practice. However, it is further suggested to reduce the Per MHz spectrum charges from existing rates to INR 10000/- per MHz / Per Annum for Teleport / DSNG / SNG/ HITS / DTH etc.</p>
<p>Q9. In case you are of the opinion that the frequency spectrum in higher frequency bands such as C band, Ku band and Ka band for space- based communication services should be assigned on shared (non-exclusive) basis, -</p> <p>(a) Whether a broad framework for sharing of frequency spectrum among satellite communication service providers needs to be prescribed or it should be left to mutual coordination? In case you are of the opinion that broad framework should be prescribed, kindly suggest the framework and elements to be included in such a framework.</p> <p>(b) Any other suggestions may kindly be made with detailed justification.</p> <p>Kindly justify your response.</p>	<p>It is recommended that India establishes national legislation and a landing rights policy to regulate satellite usage within the country. It can be incorporated in the new awaited SOP of inSPACE. To ensure proper management of satellite services, it is advisable to license service providers and earth station / teleport operators based on their application and frequency band usage, either individually or through blanket licensing. These licenses should specify who is authorized to provide services in India and under what terms &amp; conditions, including their relationship with terrestrial services in shared frequency bands.</p> <p>Regarding technical compatibility between satellite networks, the ITU has established frequency coordination procedures and criteria to ensure compatibility among satellite networks from different countries.</p> <p>For foreign satellites to obtain landing rights and offer services in India, one requirement could be to complete all necessary frequency coordination with Indian satellite networks in the respective frequency band.</p> <p>In situations where multiple satellite operators plan to operate through ITU filings submitted via India, in addition to international compatibility procedures, India must develop domestic</p>

	<p>procedures and criteria to ensure technical compatibility among the satellite networks of different Indian operators. India has the authority to determine these procedures and criteria, as the ITU does not provide directives for domestic coordination. One approach to developing domestic coordination procedures could be to base them on the ITU's international coordination procedures, potentially in a simplified manner.</p>
<p>Q10. In the frequency range 27.5-28.5 GHz, whether the spectrum assignee should be permitted to utilize the frequency spectrum for IMT services as well as space-based communication services, in a flexible manner? Do you foresee any challenges arising out of such flexible use? If yes, in what manner can the challenges be overcome? Kindly elaborate the challenges and the ways to overcome them.</p>	<p>PMSL has no comments on this.</p>
<p>Q11. In case it is decided to permit flexible use in the frequency range of 27.5 - 28.5 GHz for space-based communication services and IMT services, what should be the associated terms and conditions including eligibility conditions for such assignment of spectrum? Kindly justify your response.</p>	<p>PMSL has no comments on this.</p>
<p>Q12. Whether there is a requirement for permitting flexible use between CNPN and space-based communication services in the frequency range 28.5-29.5 GHz? Kindly justify your response.</p>	<p>PMSL has no comments on this.</p>
<p>Q13. Do you foresee any challenges in case the spectrum assignee is permitted to utilize the frequency spectrum in the range 28.5-29.5 GHz for cellular based CNPN as well as</p>	<p>PMSL has no comments on this.</p>



space-based communication services, in a flexible manner? What could be the measures to mitigate such challenges? Suggestions may kindly be made with justification.	
Q14. Whether space-based communication services should be categorized into different classes of services requiring different treatment for spectrum assignment? If yes, what should be the classification of services and which type of services should fall under each class of service? Kindly justify your response. Please provide the following details: (a) Service provider-wise details regarding financial and market parameters such as total revenue, total subscriber base, total capital expenditure etc. for each type of service (as mentioned in the Table 1.3 of this consultation paper) for the financial year 2018-19, 2019-20, 2020-21, 2021-22, and 2022-23 in the format given below:	PMSL has already provided comments to TRAI vide separate email.

Type of service: \_\_\_\_\_

Financial Year	Revenue (Rs. lakh)	Subscriber base	CAPEX for the year (Rs. lakh)	Depreciation for the year (Rs. lakh)
2018-19				
2019-20				
2020-21				

Response to TRAI Consultation Paper on  
 "Assignment of Spectrum for Space-based Communication Services".



2021-22			
2022-23			
(b) Projections on revenue, subscriber base and capital expenditure for each type of service (as mentioned in the Table 1.3 of this consultation paper) for the whole industry for the next five years starting from financial year 2023-24, in the format given below:			
Type of service: _____			
Financial Year	Revenue (Rs. lakh)	Subscriber base	CAPEX for the year (Rs. lakh)
2023-24			
2024-25			
2025-26			
2026-27			
2027-28			
Q15. What should be the methodology for assignment of spectrum for user links for space-based communication services in L-band and S-band, such as- (a) Auction-based (b) Administrative (c) Any other?  Please provide your response with detailed justification.		PMSL has no comments on this.	

<p>Q16. What should be the methodology for assignment of spectrum for user links for space-based communication services in higher spectrum bands like C-band, Ku-band and Ka-band, such as</p> <p>(a) Auction-based              (b) Administrative              (c) Any other?</p> <p>Please provide your response in respect of different types of services (as mentioned in Table 1.3 of this consultation paper). Please support your response with detailed justification.</p>	<p>The assignment of spectrum for the C, Ku, and Ka bands should be done in such a way that it is used as effectively and competitively as feasible by as many users and satellite networks as possible. This can be accomplished by allocating spectrum for user links for space-based communications through administrative processes that guarantee this happens in a timely and technologically suitable manner.</p>
<p>Q17. Whether spectrum for user links should be assigned at the national level, or telecom circle/ metro-wise? Kindly justify your response.</p>	<p>PMSL is of the view that assignment should be done on administrative basis only at PAN INDIA level.</p>
<p>Q18. In case it is decided to auction user link frequency spectrum for different types of services, should separate auctions be conducted for each type of services? Kindly justify your response with detailed methodology.</p>	<p>PSML is strongly advised against auctioning any kind of space services in C, Ku and/or Ka-band.</p>
<p>Q19. What should be the methodology for assignment of spectrum for gateway links for space-based communication services, such as</p> <p>(a) Auction-based              (b) Administrative              (c) Any other?</p> <p>Please provide your response in respect of different types of services. Please support your response with detailed justification.</p>	<p>PMSL is of the view that the satellite spectrum should continue to be allocated on administrative basis only, as per current practice</p>
<p>Q20. In case it is decided to auction gateway link frequency spectrum for different types of services, should separate auctions be conducted for each type of services? Kindly justify your response with detailed methodology.</p>	<p>PMSL is of the view that the satellite spectrum should continue to be allocated on administrative basis only, as per current practice.</p>

<p>Q21. In case it is decided to assign frequency spectrum for space-based communication services through auction,</p> <p>(a) What should be the validity period of the auctioned spectrum?</p> <p>(b) What should be the periodicity of the auction for any unsold/ available spectrum?</p> <p>(c) Whether some mechanism needs to be put in place to permit the service licensee to shift to another satellite system and to change the frequency spectrum within a frequency band (such as Ka- band, Ku-band, etc.) or across frequency bands for the remaining validity period of the spectrum held by it? If yes, what process should be adopted and whether some fee should be charged for this purpose?</p> <p>Kindly justify your response.</p>	<p>PMSL is of the view that the satellite spectrum should continue to be allocated on administrative basis only, as per current practice</p>
<p>Q22. Considering that (a) space-based communication services require spectrum in both user link as well as gateway link, (b) use of frequency spectrum for different types of links may be different for different satellite systems, and (c) requirement of frequency spectrum may also vary depending on the services being envisaged to be provided, which of the following would be appropriate:</p> <p>(i) to assign spectrum for gateway links and user links separately to give flexibility to the stakeholders? In case your response is in the affirmative, what mechanism should be adopted</p>	<p>PMSL is of the view that the satellite spectrum should continue to be allocated on administrative basis only, as per current practice. It is strongly advised against allocating spectrum for satellite communications via auction. Gateway links and user links are built for C-, Ku-, and Ka-band on the same type of satellite transponders in the same frequency bands, depending on the availability of free transponders. Assigning different frequency bands for gateway and user links is futile exercise.</p>

<p>such that the successful bidder gets spectrum for user links as well as gateway links.                  or                  (ii) to assign spectrum for gateway links and user links in a bundled manner, such that the successful bidder gets spectrum for user link as well as gateway link? In case your response is in the affirmative, kindly suggest appropriate assignment methodology, including auction so that the successful bidder gets spectrum for user links as well as gateway links.</p>	
<p>Q23. Whether any protection distance would be required around the satellite earth station gateway to avoid interference from other satellite earth station gateways for GSO/ NGSO satellites using the same frequency band? If yes, what would be the protection distance (radius) for the protection zone for GSO/ NGSO satellites?</p>	<p>When earth stations are operating in the same direction of transmission, there is no need for protection zones or separation distances between them because there won't be any chance for interference. In order to accommodate satellites in various orbital locations, it is typical for many earth stations / teleports to use the same frequency band at the same place.</p>
<p>Q24. What should be the eligibility conditions for assignment of spectrum for each type of space-based communication service (as mentioned in the Table 1.3 of this Consultation Paper)? Among other things, please provide your inputs with respect to the following eligibility conditions:                  (a) Minimum Net Worth                  (b) Requirement of existing agreement with satellite operator(s)                  (c) Requirement of holding license/ authorization under Unified License prior to taking part in the auction process.                  Kindly justify your response</p>	<p>PMSL is of the view that the satellite spectrum should continue to be allocated on administrative basis only, as per current practice. Granting access to spectrum for satellite links in the C-, Ku-, and Ka-bands through auctioning is strongly discouraged. Such an approach would have negative consequences for India's existing telecommunications infrastructure and hinder its future development. In these bands, a wide range of applications can be offered throughout the entire satellite spectrum, depending on the availability of free satellite capacity for leasing. Operators of space-based communication services vary in size and offer diverse services, from major telecom operators serving national and international markets to smaller providers offering broadband connections. During the licensing application process, it is customary to specify the satellite network involved, provide ITU references, and include other relevant characteristics. These requirements enable Indian authorities to ensure compliance with national legislation, verify the authorization of spacecraft for service provision in India (including landing rights), and confirm adherence to India's international commitments, such as coordinated limits.</p>

<p>Q25. What should be the terms and conditions for assignment of frequency spectrum for both user links as well as gateway links for each type of space-based communication service? Among other things, please provide your detailed inputs with respect to roll-out obligations on space-based communication service providers. Kindly provide response for both scenarios viz. exclusive assignment and non-exclusive (shared) assignment with justification.</p>	<p>Service providers will need to identify the satellite with which they will offer their services since access to frequency resources for space-based communication is granted through an open non-exclusive licensing process. An agreement with the satellite operator is necessary for this. Service providers are unlikely to get licenses without actual plans to launch the anticipated services because holding such contracts is expensive. Therefore, it would appear unnecessary to specify specific roll-out or milestone requirements for service providers' use of space-based communications.</p>
<p>Q26. Whether the provisions contained in the Chapter-VII (Spectrum Allotment and Use) of Unified License relating to restriction on crossholding of equity should also be made applicable for satellite-based service licensees? If yes, whether these provisions should be made applicable for each type of service separately? Kindly justify your response.</p>	<p>PMSL has no comments on this issue.</p>
<p>Q27. Keeping in view the provisions of ITU's Radio Regulations on coexistence of terrestrial services and space-based communication services for sharing of same frequency range, do you foresee any challenges in ensuring interference-free operation of space-based communication network and terrestrial networks (i.e., microwave access (MWA) and microwave backbone (MWB) point to point links) using the same frequency range in the same geographical area? What could be the measures to mitigate such challenges? Suggestions may kindly be made with justification.</p>	<p>PMSL has no comments on this issue.</p>
<p>Q28. In what manner should the practice of assignment of a frequency range in two polarizations should be taken into account in the present exercise for assignment and valuation of spectrum? Kindly justify your response.</p>	<p>At C-, Ku-, and Ka-band, it is typically possible to reuse the same frequency on two orthogonal polarizations to achieve compatibility between space-based communication networks using the same spacecraft or spacecraft with reasonable orbital separation. Since varied propagation pathways and reflections from buildings and other structures may change</p>



	the polarization orientation or break the polarization purity, using polarization discrimination may be more challenging for compatibility with terrestrial services.
<p>Q29. What could be the likely issues, that may arise, if the following auction design models (described in para 3.127 to 3.139) are implemented for assignment of spectrum for user links in higher bands (such as C band, Ku band and Ka band)?</p> <p>a. Model #1: Exclusive spectrum assignment                  b. Model#2: Auction design model based on non-exclusive spectrum assignment to only a limited number of bidders</p> <p>What changes should be made in the above models to mitigate any possible issues, including ways and means to ensure competitive bidding? Response on each model may kindly be made with justification.</p>	<p>PMSL is of the view that the satellite spectrum should continue to be allocated on administrative basis only, as per current practice It is advised strongly against granting access to spectrum for satellite links at C-, Ku and/or Ka-band through auctioning.</p>
<p>Q30. In your opinion, which of the two models mentioned in Question 29 above, should be used? Kindly justify your response.</p>	<p>See response to Q29.</p>
<p>Q31. In case it is decided to assign spectrum for user links using model # 2 i.e., non-exclusive spectrum assignment to limited bidders (<math>n + \Delta</math>), then what should be</p> <p>(a) the value of <math>\Delta</math>, in case it is decided to conduct a combined auction for all services                  (b) the values of <math>\Delta</math>, in case it is decided to conduct separate auction for each type of service</p> <p>Please provide detailed justification.</p>	<p>See response to Q29.</p>
<p>Q32. Kindly suggest any other auction design model(s) for user links including the terms and conditions? Kindly provide a detailed response with</p>	<p>See response to Q29.</p>

justification as to how it will satisfy the requirement of fair auction i.e., market discovery of price.	
Q33. What could be the likely issues, that may arise, if Option # 1: (Area specific assignment of gateway spectrum on administrative basis) is implemented for assignment of spectrum for gateway links? What changes could be made in the proposed option to mitigate any possible issues?	See response to Q29.
Q34. What could be the likely issues, that may arise, if Option # 2: Assignment of gateway spectrum through auction for identified areas/ regions/ districts is implemented for assignment of spectrum for gateway links? What changes could be made in the proposed option to mitigate any possible issues? In what manner, areas/ regions/ districts should be identified?	See response to Q29.
Q35. In your view, which spectrum assignment option for gateway links should be implemented? Kindly justify your response.	PMSL is of the view that the satellite spectrum should continue to be allocated on administrative basis only, as per current practice Licensing of space-based communications in C-, Ku- and Ka-band should be open and non-exclusive, maximizing the spectrum usage and spectrum users in India to support current use and efficient and economic further development of India's telecommunication infrastructure.
Q36. Kindly suggest any other auction design model(s) for gateway links including the terms and conditions? Kindly provide a detailed response with justification as to how it will satisfy the requirement of fair auction i.e., market discovery of price?	PMSL has no comments on this issue.
Q37. Any other issues/suggestions relevant to the subject, may be submitted with proper explanation and justification.	See response to Q29.
Q38. In case it is decided for assignment of spectrum on administrative basis, what should be the spectrum charging mechanism for assignment of spectrum for space-based communications services	PMSL has no comments on this issue.

<p>i. For User Link                  ii. For Gateway Link                  Please support your answer with detailed justification.</p>	
<p>Q39. Should the auction determined prices of spectrum bands for IMT /5G services be used as a basis for valuation of space-based communication spectrum bands                  i. For user link                  ii. For gateway link                  Please support your answer with detailed justification.</p>	<p>PMSL has no comments on this issue.</p>
<p>Q40. If response to the above question is yes, please specify the detailed methodology to be used in this regard?</p>	<p>PMSL has no comments on this issue.</p>
<p>Q41. Whether the value of space-based communication spectrum bands                  i. For user link                  ii. For gateway link                  be derived by relating it to the value of other bands by using a spectral efficiency factor? If yes, with which spectrum bands should these bands be related to and what efficiency factor or formula should be used? Please support your response with detailed justification.</p>	<p>PMSL is of the view that the satellite spectrum should continue to be allocated on administrative basis only, as per current practice A huge number of users share the available C, Ku, and Ka-band space-based spectrum resources. Each of these users offers services in India and provide revenue to the country. It is strongly advised against allocating spectrum resources for space-based communications in the C-, Ku-, and/or Ka-band through auctioning. Instead, licensing should be open and non-exclusive, maximizing spectrum usage and spectrum users in India to support current use and the effective and economical expansion of India's telecommunications infrastructure.</p>
<p>Q42. In case of an auction, should the current method of levying spectrum fees/charges for satellite spectrum bands on formula basis/ AGR basis as followed by DoT, serve as a basis for the purpose of valuation of satellite spectrum</p>	<p>See response to Q29.</p>

<p>i. For user link                  ii. For gateway link                  If yes, please specify in detail what methodology may be used in this regard.</p>	
<p>Q43. Should revenue surplus model be used for the valuation of space- based spectrum bands                  i. For user link                  ii. For gateway link                  Please support your answer with detailed justification.</p>	<p>See response to Q29.</p>
<p>Q44. Whether international benchmarking by comparing the auction determined prices of countries where auctions have been concluded for space-based communication services, if any, be used for arriving at the value of space-based communication spectrum bands:                  i. For user link                  ii. For gateway link                   If yes, what methodology should be followed in this regard? Please give country-wise details of auctions including the spectrum band/quantity put to auction, quantity bid, reserve price, auction determined price etc. Please support your response with detailed justification.</p>	<p>To the best of PMSL knowledge, no countries have auctioned spectrum for space-based communications in C-, Ku- or Ka-band.</p>
<p>Q45. Should the international administrative spectrum charges/fees serve as a basis/technique for the purpose of valuation in the case of satellite spectrum bands                  i. For user link                  ii. For gateway link</p>	<p>It is customary to charge an administrative licensing fee for operators using space-based communications. These fees vary significantly from country to country depending on the national policy, but generally are aimed at reflecting the cost of administering the licenses and the processing of the licensing application. The revenue for the country is obtained through the services provided by the licensee.</p>

Please give country-wise details of administrative price being charged for each spectrum band. Please specify in detail terms and conditions in this regard.	
Q46. If the answer to above question is yes, should the administrative spectrum charges/fees be normalized for cross country differences? If yes, please specify in detail the methodology to be used in this regard?	PMSL has no comments on this issue.
Q47. Apart from the approaches highlighted above which other valuation approaches can be adopted for the valuation of space-based communication spectrum bands? Please support your suggestions with detailed methodology, related assumptions and other relevant factors.	PMSL has no comments on this issue.
Q48. Should the valuation arrived for spectrum for user link be used for valuation for spectrum for gateway links as well? Please justify.	PMSL has no comments on this issue.
Q49. If the answer to the above is no, what should be the basis for distinction as well as the methodology that may be used for arriving at the valuation of satellite spectrum for gateway links? Please provide detailed justification.	PMSL has no comments on this issue.
Q50. Whether the value arrived at by using any single valuation approach for a particular spectrum band should be taken as the appropriate value of that band? If yes, please suggest which single approach/method should be used. Please support your answer with detailed justification.	PMSL has no comments on this issue.
Q51. In case your response to the above question is negative, will it be appropriate to take the average valuation (simple mean) of the valuations obtained through the different approaches attempted for valuation of a particular spectrum band, or some other approach like taking weighted mean, median	PMSL has no comments on this issue.

<p>etc. should be followed? Please support your answer with detailed justification.</p>	
<p>Q52. Should the reserve price for spectrum for user link and gateway link be taken as 70% of the valuation of spectrum for shared as well as for exclusive assignment? If not, then what ratio should be adopted between the reserve price for the auction and the valuation of the spectrum in different spectrum bands in case of (i) exclusive (ii) shared assignment and why? Please support your answer with detailed justification.</p>	<p>PMSL has no comments on this issue.</p>
<p>Q53. If it is decided to conduct separate auctions for different class of services, should reserve price for the auction of spectrum for each service class be distinct? If yes, on what parameter basis such as revenue, subscriber base etc. this distinction be made? Please support your answer with detailed justification for each class of service.</p>	<p>PMSL has no comments on this issue.</p>
<p>Q54. In case of auction based and/or administrative assignment of spectrum, what should the payment terms and associated conditions for the assignment of spectrum for space-based communication services relating to:</p> <ol style="list-style-type: none"> <li>i. Upfront payment</li> <li>ii. Moratorium period</li> <li>iii. Total number of instalments to recover deferred payments</li> <li>iv. Rate of discount in respect of deferred payment and prepayment Please support your answer with detailed justification.</li> </ol>	<p>PMSL is of the view that the satellite spectrum should continue to be allocated on administrative basis only, as per current practice A huge number of users share the available C, Ku, and Ka-band space-based spectrum resources. For non-exclusive licenses for space-based communications, payment for administrative filing fees could be charged in different ways. Annual upfront payment as per current practice would appear to be best approach.</p>