1. Introduction

The Mobile Satellite Services Association (MSSA) welcomes the opportunity to contribute to the consultation by the Telecom Regulatory Authority of India on the framework for Satellite Communication Network authorization and spectrum assignment.

MSSA is a non-profit industry association, founded in 2024, that seeks to promote and advance the emerging ecosystem for advanced Non-Terrestrial Network (NTN) services, including direct-to-device (D2D). MSSA supports the efforts of advanced NTN solutions providers, including terrestrial mobile and satellite operators, original equipment manufacturers, infrastructure providers, chip vendors, and others. MSSA is focused on facilitating a global ecosystem utilizing spectrum already allocated and licensed for mobile satellite services (MSS) and well-suited for integration into a broad range of mobile devices. More specifically, MSSA seeks to facilitate global mobile connectivity via satellite through open, standards-based solutions. More information about MSSA is available at www.MSSAssociation.org.

MSSA appreciates TRAI's efforts to enhance the regulatory framework for Satellite Communication Networks and facilitate their use as part of India's evolving connectivity landscape. As satellite technologies, including NTN technologies, continue to develop, ensuring alignment with international standards, including 3GPP and ITU frameworks, will be important to support interoperability, scalability, and long-term investment.

The following comments reflect MSSA's perspective on how a technology-neutral and internationally aligned regulatory framework can support the responsible and efficient development of integrated satellite–terrestrial connectivity in India. As MSSA is a trade association and not a service provider, it is responding to Questions 1 through 19 of the consultation only.

2. Questions Responses

Q1- What should be the eligibility conditions, area of operation, validity period of authorisation and the scope of the proposed Satellite Communication Network (SCN) authorisation under Section 3(1)(b) of the Telecommunications Act, 2023? Kindly provide a detailed response with justification.

MSSA supports a Satellite Communication Network (SCN) authorization framework that enables the provision of a range of satellite-based services, including Fixed Satellite Service (FSS), Mobile Satellite Service (MSS), and emerging advanced Non-Terrestrial Network (NTN) services, including D2D. As satellite and terrestrial networks continue to converge, it will be important for the framework to support both satellite-only and hybrid models, including collaboration between satellite operators and mobile network operators (MNOs), to enable seamless and efficient service delivery.

Existing MSS regulatory frameworks provide a suitable foundation for enabling advanced NTN services, including D2D. A clear and predictable framework, aligned with international practices and ITU principles, will help support investment and the continued development of integrated satellite–terrestrial connectivity.

MSSA also recognizes the potential long-term role that IMT spectrum can play in supporting advanced NTN services, including D2D. However, technical and regulatory coexistence conditions remain under active study within ITU-R in connection with WRC-27 Agenda Item 1.13. Implementation of IMT-based NTN services will benefit from continued alignment with evolving international studies and appropriate national technical assessment. A sequenced approach aligned with the outcomes of WRC-27 would promote international harmonization, safeguard coexistence integrity, and provide greater clarity for all stakeholders. Both models may ultimately coexist; however, a near-term focus on MSS-based applications would provide greater implementation clarity and regulatory certainty.

Q2-What should be the terms and conditions (general, technical, operating, security related etc.) that should be made applicable for the proposed Satellite Communication Network authorisation? Kindly provide a detailed response with justification

Regulatory requirements should avoid being overly prescriptive, allowing for different technical and operational models, including satellite-only and hybrid satellite–terrestrial architectures. MSSA further recommends that SCN authorisations should avoid inconsistent or redundant requirements. As satellite services evolve and integrate more closely with terrestrial networks, it will be important to ensure that regulatory approaches remain coordinated, clear, and predictable. That said, MSSA recognizes the importance of ensuring compliance with applicable national requirements, including security and lawful interception obligations, in a manner consistent with existing telecommunications frameworks. Alignment with internationally recognized standards, including 3GPP and relevant ITU frameworks, will support interoperability and efficient spectrum use.

Q3- Which type of authorised entities should be permitted to seek Satellite Communication Network as a Service (SCNaaS) from the entities holding the proposed Satellite Communication Network authorisation? Whether virtual network operators (VNOs) should also be permitted to seek SCNaaS? Kindly provide a detailed response with justification.

MSSA supports a broad and flexible approach to the entities that may access Satellite Communication Network as a Service (SCNaaS). Allowing a range of authorized entities, including mobile network operators and other service providers, to access SCNaaS can help promote service innovation and efficient utilization of satellite capabilities. In this context, regulatory frameworks should remain open to different access models that may emerge over time. Overall, a flexible framework that accommodates evolving service delivery models will help support the development of integrated satellite–terrestrial connectivity.

Q4- Whether the SCN authorised entity establishing, operating, maintaining, or expanding the baseband system along with SCN should be mandated to extend control, visibility, resource allocation and management of the telecommunication services, being provisioned using SCN to users, to the partnering entity on mutually agreed terms and conditions? Please provide a detailed response with justification.

In MSSA's view, operational arrangements between SCN authorized entities and partnering service providers should be defined through commercially agreed frameworks. Regulatory approaches should allow flexibility in how responsibilities related to network operations, service delivery, and resource management are structured between parties, reflecting different technical architectures and partnership models. A non-prescriptive approach will better support innovation, efficient service delivery, and the development of evolving satellite–terrestrial integration models.

Q5- What provisions should be included in the terms and conditions of Satellite Communication Network (SCN) authorisation considering the policy/ Act in the Space sector? Kindly provide a detailed response with justification.

MSSA supports alignment between the SCN authorization framework and existing space and telecommunications regulatory frameworks, with the objective of avoiding inconsistent or redundant

requirements. As satellite services evolve and integrate more closely with terrestrial networks, it will be important to ensure that regulatory approaches remain coordinated, clear, and predictable. Existing regulatory frameworks provide a suitable foundation for enabling advanced NTN services, including D2D. A streamlined and consistent approach will facilitate efficient deployment and support long-term investment in integrated satellite–terrestrial connectivity.

Q6- Whether there is any need for mandating a reference agreement between the entities holding the proposed Satellite Communication Network authorisation and the authorised entities providing telecommunication service? If yes, what should be the salient features of the reference agreement between such entities? Kindly provide a detailed response with justification.

As discussed above, in MSSA's view, parties should retain significant flexibility to structure commercial arrangements that respond to market needs. Among other things, parties should be permitted to explore a variety of models for service delivery and operational coordination. Different partnership models may emerge depending on technical and commercial requirements. Maintaining flexibility in commercial agreements will support innovation and the development of a range of satellite–terrestrial service models.

Q7- With respect to the interconnection with the proposed Satellite Communication Network Authorised Entities, whether there are any other issues in addition to those raised in TRAI's consultation paper on 'Review of existing TRAI Regulations on Interconnection matters' dated 10.11.2025, which require to be addressed in this consultation process? Please provide a detailed response with justification.

MSSA recognizes the importance of enabling effective interconnection between satellite networks and existing telecommunications infrastructure. As NTN services continue to evolve, satellite connectivity is increasingly being integrated as part of the broader mobile ecosystem. In this context, alignment with internationally recognized standards, including 3GPP and ITU frameworks, will be key to supporting interoperability and seamless service delivery.

Q8- Any other inputs or suggestions relevant to the proposed Satellite Communication Network authorisation may kindly provided with detailed justification.

MSSA reiterates the importance of maintaining a unified regulatory framework that supports the integration of satellite and terrestrial networks using MSS spectrum. Ensuring regulatory certainty and predictability will be important to support investment and long-term planning. In addition, enabling early deployment of advanced NTN services, including D2D, within internationally harmonized Mobile-Satellite Service (MSS) allocations can provide a clear and structured pathway for implementation.

Satellite-enabled NTN services using MSS spectrum can also deliver a range of important public interest benefits, including:

- Extending connectivity to underserved and remote areas
- Supporting emergency and disaster communications
- Enhancing network resilience and service continuity
- Enabling broader digital inclusion across diverse geographies

These capabilities are complementary to existing terrestrial networks and can help support national connectivity objectives. Alignment with international standards and frameworks, including ITU and 3GPP, will further support interoperability and the development of scalable device ecosystems.

Q9- Which of the following services should be permitted to be provided by using the SCNs established by the proposed SCN authorised entities:
(a) Fixed Satellite Service (FSS);
(b) Mobile Satellite Service (MSS);
(c) Direct-to-Device (D2D) Service via satellite by using MSS spectrum;
(d) Direct-to-Device (D2D) Service via satellite by using IMT spectrum?
Kindly provide a detailed response with justification.

MSSA supports the inclusion of Mobile Satellite Service (MSS) within the proposed SCN framework. It would be appropriate to treat the provision of NTN services, including D2D services, in MSS spectrum as a type of MSS. This would be consistent with MSSA's observation above that existing MSS regulatory frameworks provide a suitable foundation for enabling advanced NTN services, including D2D. These services can be implemented within existing ITU allocations and national licensing frameworks, without the need for new spectrum allocations or regulatory changes.

As discussed above, MSSA recognizes the potential long-term role that IMT spectrum can play in supporting advanced NTN services, including D2D. However, technical and regulatory coexistence conditions remain under active study within ITU-R in connection with WRC-27 Agenda Item 1.13. Implementation of IMT-based D2D services will benefit from continued alignment with evolving international studies and appropriate national technical assessment. A sequenced approach aligned with the outcomes of WRC-27 would promote international harmonization, safeguard coexistence integrity, and provide greater clarity for all stakeholders. Both models may ultimately coexist; however, a near-term focus on MSS-based applications would provide greater implementation clarity and regulatory certainty.

Q10- Whether D2D Service via satellite by using IMT spectrum should be permitted at this stage itself, or should this matter be examined after considering the outcome of WRC-2027? Kindly provide a detailed response with justification.

MSSA reiterates its position on IMT spectrum stated above in Q9.

Q11- From the perspective of holding spectrum for the feeder link and the user link on SCNs, which of the following combinations should be permitted at the SCNs established by the proposed SCN authorised entities:

Combination No.	*Spectrum for the feeder link held by -*	*Spectrum for the user link held by -*
1	SCN authorised entity	SCN authorised entity
2	SCN authorised entity	Partnering entity (service provider)
3	Partnering entity (service provider)	SCN authorised entity
4	Partnering entity (service provider)	Partnering entity (service provider)

Kindly provide a detailed response with justification.

MSSA considers that multiple spectrum-holding arrangements may be possible depending on the specific technical and regulatory framework adopted, subject to the considerations outlined in response to Questions 9, 10, and 19.

Given the range of potential implementation models and the evolving nature of satellite–terrestrial integration, MSSA does not take a specific position on the combinations outlined above.

A flexible and non-prescriptive approach would allow different architectures to develop in line with market needs and international frameworks.

Q12- Which of the following types of spectrum should be assigned to the proposed SCN authorised entities:
(a) Spectrum in the frequency bands allocated for FSS
(b) Spectrum in the frequency bands allocated for MSS
(c) Any other?
Kindly provide a detailed response with justification.

MSSA believes that the SCN framework should cover frequency bands allocated for MSS. Allowing operators and service providers to access and use different bands based on technical and service needs will support a broader range of use cases. A technology-neutral approach to spectrum use will be important to support innovation and efficient deployment.

Q13- What should be the broad policy and regulatory framework for the assignment of FSS spectrum and/ or MSS spectrum to the proposed SCN authorised entities? Specifically, -

(a) NGSO-based FSS and GSO/ NGSO-based MSS: Whether in respect of NGSO-based FSS and GSO/ NGSO-based MSS, TRAI's recommendations dated 09.05.2025 on 'Terms and Conditions for the Assignment of Spectrum for Certain Satellite-Based Commercial Communication Services' to DoT (read with the TRAI's response dated 08.12.2025 to DoT's back-reference dated 12.11.2025) should be made applicable to SCN authorised entities with necessary modifications? If yes, what modifications would be required in the terms and conditions for the assignment of spectrum for NGSO-based FSS and GSO/ NGSO-based MSS? If no, what should be the terms and conditions for this purpose?
(b) GSO-based FSS: Whether the terms and conditions for the assignment of spectrum to SCN authorised entities for GSO-based FSS should be analogous to those recommended by TRAI for NGSO-based FSS and GSO/ NGSO-based MSS through its recommendations on 'Terms and Conditions for the Assignment of Spectrum for Certain Satellite-Based Commercial Communication Services' dated 09.05.2025 (read with the TRAI's response dated 08.12.2025 to DoT's back-reference dated 12.11.2025) with necessary modifications? If yes, what modifications would be required for GSO-based FSS? If no, what should be the terms and conditions for this purpose?

Kindly provide a detailed response with justification.

MSSA supports an approach that builds on existing regulatory frameworks for the assignment of FSS and MSS spectrum while providing appropriate flexibility to accommodate evolving service models. A predictable and aligned approach will support long-term investment and the continued development of satellite and NTN ecosystems.

Q14- What should be the eligibility conditions for seeking administrative assignment of FSS spectrum and/or MSS spectrum by the proposed SCN authorised entities? Kindly provide a detailed response with justification.

MSSA generally supports clear and technology-neutral eligibility criteria for entities seeking access to FSS and MSS spectrum. At the same time, it is necessary that administrative assignments, particularly for MSS spectrum, are consistent with established ITU frameworks and coordination processes, reflecting the technical characteristics and sharing environment of these bands. Eligibility conditions should be clearly stated and objective, based on demonstrated technical and operational capability, while ensuring consistency with applicable international and national regulatory frameworks.

Q15- Whether there are any other inputs or suggestions relevant to the assignment of FSS spectrum and/ or MSS spectrum to the entities holding the proposed SCN authorisation? Kindly provide a detailed response with justification.

MSSA reiterates that ensuring consistency with ITU frameworks and coordination processes will be important to maintain global harmonization and protect existing services and support effective spectrum assignment.

Q16- In case it is decided to permit the proposed SCN authorised entity to utilize the FSS spectrum and/ or MSS spectrum assigned to a service authorised entity ("partnering entity") for the purpose of providing SCNaaS to the partnering entity – whether there is a need to establish a policy and regulatory framework for enabling the SCN authorised entity to enter into an agreement/ arrangement with the partnering entity to utilize FSS spectrum and/ or MSS spectrum assigned to such partnering entity for the purpose of providing SCNaaS to the partnering entity?
(i) If yes, what should be the terms and conditions under such a framework?
(ii) If no, in what manner such agreements/ arrangements should be enabled and regulated?
Kindly provide a detailed response with justification.

MSSA supports a flexible framework that enables agreements between SCN authorized entities and partnering service providers for the use of assigned spectrum. Such arrangements should be commercially negotiated between parties, reflecting different service models and operational requirements. A range of partnership structures may emerge depending on the specific technical and commercial context. A non-prescriptive approach will support efficient collaboration, innovation, and the continued development of integrated satellite–terrestrial service models.

Q17 Whether there are any other inputs or suggestions relevant to the agreement/ arrangement between the proposed SCN authorised entities and service authorised entities ("partnering entities") to utilize the FSS spectrum and/ or MSS spectrum assigned to such partnering entities? Kindly provide a detailed response with justification.

Regulatory frameworks should allow parties to define appropriate arrangements for spectrum use and service delivery, reflecting different operational and partnership models. Avoiding unnecessary regulatory rigidity will help facilitate timely implementation, support innovation, and enable the evolution of integrated satellite–terrestrial services.

Q18- In case it is decided to permit D2D service via satellite by using the spectrum in the frequency bands allocated for MSS such as L-band and S-band, whether there is a need to establish a policy and regulatory framework for enabling and regulating such a service? If yes, kindly suggest a broad framework for this purpose and the key terms and conditions to be included under such a it? Kindly provide a detailed response with justification.

Internationally harmonized MSS allocations, particularly in L- and S-bands, provide a well-established and structured foundation for D2D deployment. These bands are already incorporated into 3GPP NTN standards and are supported by existing coordination mechanisms under the ITU Radio Regulations. MSS-based D2D services can be implemented within these existing frameworks, without the need for new spectrum allocations or fundamental regulatory changes. Leveraging this established environment enables early deployment while ensuring efficient spectrum use and effective coexistence with other services.

Maintaining alignment with international standards will also support device interoperability, scalability, and the continued development of the global NTN ecosystem.

Q19- In case with a view to enable D2D service via satellite using IMT spectrum, it is decided to permit the proposed SCN authorised entity to utilize IMT spectrum assigned to a service authorised entity ("partnering entity") for the purpose of providing SCNaaS to the partnering entity, -

(a) whether there is a need to establish a policy and regulatory framework for enabling the SCN authorised entity to enter into an agreement/ arrangement with the partnering entity to utilize IMT spectrum assigned to such partnering entity for the purpose of providing SCNaaS to the partnering entity? If yes, what should be the terms and conditions under such a framework? If no, in what manner such arrangements should be enabled and regulated?

(b) Which frequency bands identified for IMT should be considered for this purpose? Specifically, whether only FDD-based frequency bands should be considered?

(c) For the frequency bands identified for IMT where D2D is decided to be permitted, whether the National Frequency Allocation Plan (NFAP) should be modified to include MSS on a secondary basis? If yes, kindly furnish your suggestion for the proposed modification(s).

(d) To mitigate the issues related to cross-border interference, whether any other condition in addition to Article 4.4 of the ITU-Radio Regulations is required to be made applicable?

(e) What regulatory framework should be established for ensuring interference-free operation of D2D service via satellite by using IMT spectrum within the country? Specifically, which of the following methods should be followed:

(i) The SCNs established by SCN authorised entities should be permitted to be used to provide D2D service via satellite by using IMT spectrum only if a single partnering entity (access service provider) holds the relevant IMT frequency channel in all the 22 LSAs of the country and agrees to permit the usage of its IMT frequency channel by the SCN authorised entity at its SCN for the purpose of providing SCNaaS; or

(ii) The SCNs established by SCN authorised entities should be permitted to be used to provide D2D service via satellite by using IMT spectrum if one or more access service providers – together holding the assignment of the relevant IMT frequency channel across all 22 licensed service areas of the country – agree to allow the usage of their IMT frequency channel by the SCN authorised entity at its SCN for the purpose of providing SCNaaS; or

(iii) Any other method?

Kindly provide a detailed response with justification.

MSSA recognizes the potential for D2D services to be provided using IMT spectrum as part of a broader hybrid satellite–terrestrial model. Such models could enable additional innovation and support closer integration between satellite operators and licensed mobile network operators and licensed mobile networks operators, particularly where the relevant spectrum rights are clearly established and appropriate coordination mechanisms are in place.

At the same time, D2D operations within IMT bands involve technical and regulatory considerations that may be addressed in a coordinated manner to ensure successful implementation. This includes coordination with terrestrial mobile networks, cross-border consideration, protection of existing services, and alignment with ongoing ITU-R studies under WRC-27 Agenda Item 1.13.

MSSA supports a forward-looking framework that allows India to consider IMT-based D2D approaches in a structured and internationally aligned manner, informed by the outcome of the WRC-27 Agenda Item 1.13 and relevant national coexistence studies. A phased approach, informed by international studies and national technical assessment, can help support innovation while ensuring that coexistence rules are clear, technically robust, and predictable for all stakeholders.

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3. Conclusion

As India continues to advance its connectivity objectives, the integration of satellite and terrestrial networks presents a significant opportunity to extend coverage, enhance resilience, and enable new service capabilities. In this context, standards-based NTN solutions, including D2D solutions, can play an important role within the broader mobile ecosystem.

A regulatory approach that is flexible, technology-neutral, and aligned with international standards—particularly those developed within 3GPP and the ITU—will be important to support interoperability, efficient spectrum use, and long-term investment. Prioritizing the use of internationally harmonized MSS spectrum for near-term deployment, while allowing the evolution of hybrid satellite–terrestrial models in line with ongoing international developments, can provide a structured and balanced pathway forward.

MSSA appreciates the opportunity to participate in this consultation process and looks forward to working with TRAI and other stakeholders to develop and implement a coordinated and internationally aligned approach to satellite–terrestrial integration.