



**TRAI Consultation Paper on the
Framework for Satellite Communication Network Authorisation and
Spectrum Assignment in India**

Lynk Global, Inc. Response

I. Introduction

Lynk Global, Inc. (“Lynk”) applauds the TRAI for being forward thinking and considering the implementation and deployment of Direct-to-Device (“D2D”) mobile satellite services (“MSS”) via MSS spectrum and IMT spectrum given the positive impacts that both D2D spectrum options will have on India’s telecommunications infrastructure. D2D MSS will expand wireless services into unserved and underserved remote and rural communities, enabling efficient and effective ways for the provision of mobile services throughout India. Moreover, D2D MSS complements and enhances the existing terrestrial network infrastructure. By utilizing 3GPP standards, D2D MSS systems operate under clear and well-understood mechanisms for spectrum sharing and deployment of spectrum for a variety of use cases, which will bring numerous benefits to consumers, businesses, and governments. For instance, D2D MSS enhances the reliability and resilience of terrestrial communications services while fostering continued investment and advancement of wireless networks with innovative applications. Allowing emerging MSS applications, such as D2D, will provide citizens, businesses, and government agencies in India with an additional pathway to resilient and innovative communications. This approach is consistent with ongoing global regulatory developments, including work within the ITU Radiocommunication Sector and recent WRC-23 outcomes, which are exploring the integration of satellite and terrestrial networks—an approach that can be implemented today using existing technologies and regulatory frameworks.

Lynk stands ready to bring its novel D2D Low Earth Orbit (“LEO”) non-geostationary (“NGSO”) MSS system to India. Lynk's proprietary system deploys 3GPP-compliant fronthaul capabilities from satellites (*i.e.*, cell towers in space) to terrestrial mobile networks by two complementary pathways. The first is via MSS spectrum to supplement the terrestrial wireless network with enhanced capabilities as well as additional coverage and resiliency. The other path is via terrestrial IMT spectrum in partnership with Mobile Network Operators (“MNO”) to complement their services. Lynk’s system is designed to operate in a manner that avoids harmful interference and aligns with established spectrum sharing principles under 3GPP and international regulatory frameworks. Lynk’s service complements the terrestrial mobile network by enabling ubiquitous last-mile connectivity, that will expand coverage to everyone, everywhere in India, particularly in areas where terrestrial networks cannot reach due to economic or technical constraints. Consequently, Lynk’s system provides instantaneous mobile coverage and enhances the resiliency of existing MNOs’ infrastructure during emergencies and natural disasters. By creating a standard communications platform that eliminates the risk of cellular network disruption for end users, Lynk’s system will revolutionize the emergency response landscape by supporting first responders, government agencies, and affected communities across India and globally when connectivity is needed most. To further enhance the capabilities of Lynk’s services and supplement the terrestrial wireless networks, Lynk’s satellite system also utilizes MSS spectrum to deliver yet another pathway to innovative, resilient communications for people, businesses, and government agencies in India.

Lynk’s D2D system is 3GPP-compliant on the air interface while leveraging proprietary innovations to extend coverage and performance. Lynk’s novel D2D system connects existing, unmodified phones today and is engineered to support future 3GPP devices as standards evolve. Moreover, in partnership with SES, Lynk’s D2D system will uniquely bring to India a multi-orbit solution that will expedite D2D service deployment timelines while providing flexibility to MNOs and end users with complementary



and supplementary D2D services. In LEO, LYNK's satellites act as "cell towers in space," presenting as standard terrestrial base stations to the handset and roaming transparently through the host MNO's core network, resulting in authentication, routing, emergency features, and lawful intercept following well-understood mobile processes all handled by the local MNO. At the same time, LYNK's architecture is capable of combining with other orbits for resiliency and scale. Traffic from LEO can be relayed through LYNK's trusted partner, SES, in geosynchronous Earth orbit ("GEO") and/or medium Earth orbit ("MEO") to accelerate service introduction, provide additional backhaul, and add redundancy during outages and disaster scenarios.

LYNK's D2D services scale along two levers: constellation deployment phases and accessible spectrum. First, LYNK's phased roadmap expands from coverage-first services (*e.g.*, messaging, voice, and light data) to higher throughput and, ultimately, mobile broadband as satellites and beams densify. This lets India start where the need is greatest and add capacity where adoption is fastest. Second, total capacity scales with available channelization and cell/beam planning. More access to spectrum and additional beams increases aggregate throughput, capacity, and service capabilities, while four (4) factors govern the quality of service ("QoS") and user experience—see response to Q2.

II. Questions & Responses

1. 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.

The establishment of a unified and forward-looking Satellite Communication Network ("SCN") authorisation framework under Section 3(1)(b) of the Telecommunications Act, 2023 is essential to enable the seamless integration of satellite and terrestrial networks and to support the evolution of next-generation connectivity solutions such as D2D.

LYNK supports a framework that is aligned to a clear allocation of responsibilities that reflects the commercial and technical realities of D2D services, as well as preserves the licensed Indian MNO's control over its subscribers and compliance obligations. D2D services are an application of the MSS, therefore, Satellite Network Operators ("SNO") should be the ones providing D2D services in both MSS and IMT spectrum and are best positioned to do so. Accordingly, LYNK recommends a dual approach that keeps roles where each party is strongest and preserves India's sovereignty and consumer protections:

- For D2D via MSS spectrum, SNOs should be wholesale network providers of the satellite radio access and space/ground segment such that spectrum control and international coordination (EPFD/PFD, ITU filings, cross-border, etc.) remain with the SNOs, while commercial distribution is primarily through local MNO partners. Consequently, TRAI should adopt an efficient satellite licensing framework for effective deployment of D2D via MSS spectrum.
- For D2D via IMT spectrum, MNOs should remain the retail service providers to end users for D2D, because the D2D services are an extension of their licensed mobile service, numbering, emergency obligations, and customer protections. Considering the SNO's D2D service must operate secondary in accordance with the MNO's spectrum authorisation, a light touch regulatory schema is fitting here—*i.e.*, TRAI should expressly recognize that the MNO's exclusive use of the spectrum authorised to it includes the secondary use of the spectrum by third parties, and that such secondary use be non-exclusive and proceed without additional regulatory intervention beyond the MNO authorisation and agreed technical guardrails between the MNO and SNO.



Furthermore, the cooperation model between SNOs and MNOs is well understood. LYNK has more than fifty (50) MNO partners in more than sixty (60) countries spanning all seven (7) continents. The agreements between LYNK and partner MNOs recognize the MNO's exclusive use of the spectrum authorised to it, which includes secondary use of that spectrum by third parties. These agreements include both commercial and technical terms on spectrum sharing, interference mitigation, operational protocols, and QoS metrics. This cooperation model not only ensures efficient and effective deployment of the IMT spectrum, but this arrangement also alleviates any interference concerns because the SNO must operate in accordance with the MNO's authorised use of the spectrum. Notably, the SNO's secondary use of the IMT spectrum under the 3GPP standards further decreases any interference concerns.

For D2D services, the QoS is a function of the following four (4) factors:

- (A) the well-understood cooperation model between SNOs and MNOs (as explained above);
- (B) the amount of spectrum allocated for the D2D service;
- (C) the number of satellites in orbit, coupled with the satellites' individual performance, and in the aggregate; and
- (D) the spectrum used in accordance with the 3GPP standards, serving to alleviate interference concerns and simplifying integration with the MNO's core network.

The combination of these factors will determine the supported data rates, which in turn will determine the level of services offered.

Consequently, the SCN authorisation should be available to any qualified entity that intends to establish, operate, maintain, or expand a satellite communication network for wholesale use by authorised telecom service providers. Eligibility should be based on objective and proportionate conditions, including legal presence, financial and technical capability, security compliance, and the ability to obtain and maintain any applicable space-sector, satellite-system, spectrum, and coordination approvals. However, eligibility should not depend on owning every network element, owning satellites, operating local gateways, holding a retail telecom service authorisation, or building duplicative local infrastructure. An SCN provider should be permitted to use owned, leased, or partner-provided space segment, ground segment, gateway, cloud, baseband, and network-management resources, provided it remains accountable for the authorised SCN functions. This framework is consistent with the proposed role of SCN authorisation as a network authorisation under Section 3(1)(b).

The area of SCN operation should be all of India, with actual operations limited by the relevant satellite coverage, spectrum assignment, service authorisation of the customer-facing provider, MNO agreement, and any applicable Licensed Service Area ("LSA") specific IMT rights. The authorisation should not require nationwide deployment before service may begin. For D2D via MSS spectrum, the SCN authorisation should support wholesale D2D capability in assigned MSS bands without auctions, duplicative handset approvals, or unnecessary local-infrastructure mandates. For D2D via IMT spectrum, operations should be permitted only in the LSAs where the partnering MNO holds the relevant IMT spectrum and authorizes secondary, non-interference, non-protected use. The scope should include SCNaas, satellite network operation, baseband and resource management, user-link and feeder-link operation, gateway interconnection where needed, and wholesale connectivity to authorised service providers, but not retail telecom service provision unless separately authorised. The validity period should be long enough to support satellite investment, preferably twenty (20) years with a predictable renewal path, subject to continued compliance.

See responses to Q18 (D2D via MSS spectrum) and Q19 (D2D via IMT spectrum).



2. 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.

The most efficient and effective path to the launch and scale of D2D services is:

- Regulatory enablement without the market failures—see response to Q8.
- Standards-first integration—keep the D2D air interface 3GPP-aligned and traffic home-routed via the MNO’s core to minimize bespoke integration and preserve local requirements with the local MNO. An MNO-centric, home-routed architecture ensures a D2D service behaves like a terrestrial extension. For example, Lynk’s satellites act as “cell towers in space” with authentication, billing, legal intercept, etc. handled in the core of the local MNO partner.
- Outcome-based oversight with focus on the four (4) QoS factors—see response to Q1—rather than prescriptive QoS mandates, as QoS factors ultimately set data rates/services delivered.

Hence, D2D regulations should take a light-touch approach, encouraging swift deployment and discouraging exclusive commercial relationships between MNOs and SNOs. Non-exclusive partnering ensures each MNO can work with more than one SNO, which improves pricing and resilience for users. The cooperation model (outlined in response to Q1) remains well understood regardless of whether one SNO is working with multiple MNOs and vice versa. Also, India does not need prescriptive QoS or SLA mandates for D2D via MSS and IMT spectrum. Service quality is a function of satellite system design, the spectrum that is available, the scale of the constellation, and the cooperation model between the satellite provider and the mobile operators (*i.e.*, the QoS factors outlined in response to Q1). Instead, TRAI should focus on structural safeguards such as home-routing through India MNO cores, alignment with 3GPP standards, and non-exclusive commercial access. Outage reporting, coverage disclosures, emergency calling verification, and a clear process for customer complaints—all of which are handled by the MNO—ensure QoS. This approach protects users and expedites D2D service launch while avoiding rigid rules that could unnecessarily slow innovation and deployment.

See responses to Q18 (D2D via MSS spectrum) and Q19 (D2D via IMT spectrum).

3. 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.

All authorised telecom service providers should be permitted to seek SCNaaS from an SCN authorised entity, provided the SCNaaS is used only within the scope of the recipient’s own service authorisation. This should include access service providers/MNOs, internet service providers, enterprise or captive-network service providers, and any other authorised entity that is permitted to provide the relevant telecom service to end users or customers. The SCN authorised entity should provide the satellite network capability on a wholesale basis, while the service-authorised entity should remain responsible for its own retail service obligations, customer relationship, lawful interception, emergency services, consumer protection, billing, numbering, and data-sovereignty requirements. This approach avoids forcing every service provider to build or license its own satellite network and enables satellite capacity to be used efficiently across multiple service models.

VNOs should also be permitted to seek SCNaaS, but only within the scope of their VNO authorisation and any required arrangements with the underlying licensed service provider. For D2D via MSS spectrum, VNOs should be free to obtain SCNaaS from an SCN authorised entity and offer services within their authorised scope. For D2D via IMT spectrum, a VNO should not be able to authorize use of IMT spectrum on its own because the relevant access service provider/MNO remains the spectrum-rights holder and must control any secondary D2D use of that spectrum. A VNO could participate in



the retail or customer-facing service model only where the relevant MNO has authorised the D2D use and the VNO's role is consistent with its authorisation. This non-exclusive, wholesale framework promotes competition, supports flexible business models, prevents unnecessary duplication of satellite infrastructure, and allows D2D and other satellite services to scale efficiently.

4. 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.

Lynk does not support a rigid mandate requiring the SCN authorised entity to transfer control, visibility, resource allocation, or service management to the partnering entity in all cases. These matters should be addressed through mutually agreed commercial and technical arrangements, based on the applicable service model and network architecture. The SCN authorised entity should remain responsible for managing the satellite network, baseband system, beam planning, satellite resources, capacity allocation, and technical operation of the SCN. The partnering entity should receive the operational visibility, interfaces, reporting, and service-level information needed to meet its own regulatory, customer, security, billing, emergency service, and quality-of-service obligations. That does not require a blanket transfer of control over the SCN or its baseband system.

This approach preserves accountability, protects licensed spectrum, avoids duplicative or unnecessary regulation, and allows D2D services to be deployed under flexible, commercially negotiated arrangements. For D2D via MSS spectrum, the SCN authorised entity should not be required to give a partnering entity control over MSS spectrum resources or satellite network management unless the parties agree to that structure—see the cooperation model outlined in response to Q1. For D2D via IMT spectrum, the partnering access service provider/MNO should retain control over the use of its licensed IMT spectrum. This includes the ability to authorize, limit, suspend, or terminate D2D operations using its spectrum in the relevant LSAs, and to agree on service areas, channels, power limits, operational parameters, and interference-management procedures. However, the SCN authorised entity should continue to manage the satellite-side technical functions needed to operate the SCN safely and efficiently. In both cases, the rules should require cooperation and sufficient operational transparency, not prescribe a one-size-fits-all control model.

MNO-SNO collaboration should be required in the provisioning of D2D services. The cooperation model is well understood—see response to Q1—and can be enhanced with the following guardrails:

- Non-exclusive Partnerships: allow multiple SNO-MNO pairings to keep prices competitive, coverage improving, and continued innovation.
- Home-routing to India MNO cores: codify D2D home-routing through local MNO partner's core to satisfy local requirements such as lawful intercept, data localization, emergency features, and consumer protection.
- Standards alignment (3GPP NTN): ordinary phones work without new end-user hardware, and existing handset approvals are sufficient for operating with D2D services.

The regulatory framework should therefore enable flexible arrangements that clearly allocate responsibilities between the SCN provider and the partnering entity, without imposing unnecessary operational constraints that could delay implementation or limit deployment models (*i.e.*, D2D via IMT and/or MSS spectrum).

See responses to Q2, Q8 (Market Failures), Q18 (D2D via MSS spectrum), and Q19 (D2D via IMT spectrum).



5. 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.

SCN authorisation terms should be clear, light-touch, and non-duplicative. The SCN authorised entity should maintain any applicable approvals for space activities, satellite capacity, satellite control, TT&C, mission control, orbital operations, liability, and space-object matters under the applicable space-sector framework. Telecom authorisation, spectrum assignment, network security, lawful interception, and service-related conditions should remain within the applicable telecom framework. The SCN authorisation should not re-review matters already addressed under the space-sector framework, and it should not require unnecessary local infrastructure, local gateways, local satellite-control facilities, or duplicative in-country network elements as a condition of authorisation. Any local presence, routing, gateway, security, or control requirement should be limited to what is necessary for lawful interception, emergency services, national security, consumer protection, and data-sovereignty compliance.

This approach preserves Indian sovereign oversight, avoids duplicative regulation, protects terrestrial networks, promotes competition, and enables timely D2D deployment. For D2D via MSS spectrum, India should adopt an efficient satellite licensing framework that authorizes qualified SNOs to provide D2D services in MSS bands without auctions, duplicative handset approvals, or unnecessary local infrastructure mandates. For D2D via IMT spectrum, the SCN entity should operate only with the consent of the relevant access service provider/MNO and only in the LSAs where that MNO holds the applicable IMT spectrum rights. The SCN use should be secondary on a non-interference, non-protected basis, and subject to the MNO's technical and operational control. In both cases, partnerships between SNOs and MNOs should be non-exclusive, and customer-facing obligations should remain anchored through the Indian MNO or other authorised service provider where applicable, including authentication, numbering, billing, emergency services, lawful interception, consumer protection, and data sovereignty through home-routing via the Indian MNO core.

See responses to Q8 (Market Failures), Q18 (D2D via MSS spectrum), and Q19 (D2D via IMT spectrum).

6. 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.

Lynk does not consider it necessary to mandate a reference agreement between SCN authorised entities and authorised telecom service providers. The commercial, technical, and operational arrangements between an SNO/SCN provider and an MNO or other authorised service provider should be negotiated by the parties based on the specific service model, spectrum band, network architecture, and customer offering. A mandatory reference agreement, however, would risk freezing one business model into the rules, slowing deployment, and creating unnecessary regulatory burden. The framework should instead allow non-exclusive, flexible agreements between the MNO and SNO that preserve the SCN entity's responsibility for satellite network operations and the service provider's responsibility for its customer-facing regulatory obligations—see the well understood cooperation model outlined in response to Q1.

This approach protects regulatory interests while preserving commercial flexibility and enabling timely D2D deployment. For D2D via MSS spectrum, the agreement should allow the SCN entity to provide wholesale satellite capability to authorised service providers without auctions, duplicative handset



approvals, or unnecessary local-infrastructure mandates. For D2D via IMT spectrum, the agreement should remain a market-led arrangement under which the MNO authorizes use of its IMT spectrum in the relevant LSAs and retains technical and operational control over that spectrum. If minimum regulatory guardrails are considered necessary, they should be limited to outcome-based requirements rather than a prescribed reference agreement. These may include non-exclusive SNO-MNO arrangements, interference management, service activation areas, lawful interception support, emergency service support, cybersecurity, customer protection, data sovereignty, reporting, and termination or suspension procedures.

See responses to Q18 (D2D via MSS spectrum) and Q19 (D2D via IMT spectrum).

7. 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.

Lynk does not believe this consultation should create a separate or prescriptive interconnection framework for SCN authorised entities beyond the issues already being considered in the broader interconnection review. The SCN consultation notes that the separate TRAI interconnection consultation is already examining satellite-based interconnection, including satellite-to-satellite, satellite-to-Public Land Mobile Network ("PLMN"), and satellite-to-Public Switched Telephone Network ("PSTN") interconnection. For SCN authorisation, the rules should therefore be limited to D2D and SCNaas specific clarifications. In particular, interconnection should not be used to impose unnecessary local infrastructure, local gateways, local network operations centers, or duplicative in-country network elements where the same regulatory outcomes can be achieved through existing telecom compliance frameworks. The focus should be on lawful intercept, emergency services, cybersecurity, consumer protection, data sovereignty, service continuity, and interference management—not on prescribing a physical network architecture.

D2D services should be positioned as complementary to existing cellular services in IMT spectrum and as a supplementary layer in MSS spectrum. For D2D via IMT spectrum, interconnection should reflect that the service is an extension of the partnering MNO's terrestrial network. The handset should use the same SIM, number, and customer relationship, and traffic should be home-routed through the Indian MNO core so that authentication, billing, emergency services, lawful interception, and customer obligations remain with the MNO. The SCN entity should not be required to duplicate those functions or establish separate retail-facing infrastructure. For D2D via MSS spectrum, the SCN entity should be permitted to provide wholesale satellite capability to authorised telecom service providers through flexible IP, roaming, gateway, or other commercially agreed interfaces, without auctions, duplicative handset approvals, or unnecessary local-infrastructure mandates. In MSS spectrum, D2D services add coverage, capacity, and resilience in a variety of environments and various conditions where neither terrestrial nor D2D via IMT bands can reach. In Lynk's D2D system, the handset registers to "cell towers in space" only when the MNO's terrestrial signal is unavailable. All authentication, policy, billing, emergency, and lawful intercept remain with the Indian MNO because traffic is home-routed through the partner MNO core. This architecture preserves sovereignty, fits existing operational tooling, and avoids unfair competition with terrestrial networks that continue to serve the vast bulk of mobile demand. This approach keeps D2D complementary to terrestrial networks in IMT spectrum and supplementary in MSS spectrum, while preserving regulatory control, reducing cost and delay, and enabling timely deployment. This framing keeps D2D services from competing with cellular and instead makes it an extension that preserves the primacy of terrestrial networks.



Efficient deployment of D2D services does not require additional infrastructure beyond the local partner MNO's core network. LYNK's D2D solution produces tangible public-interest dividends without imposing heavy ex-ante prescription on SNOs, MNOs, or end users while keeping the burden on regulators light. First, 3GPP device-native compatibility avoids new hardware mandates and accelerates adoption through MNO partnerships already proven in dozens of countries. Second, orbit diversity hardens national resilience by providing alternate routing and surge capacity when terrestrial networks are congested or impaired. Third, a hybrid spectrum posture—*i.e.*, D2D via MSS spectrum by satellite licensing and via IMT spectrum by MNO agreement —aligns with international practice while letting MNOs match the right orbit/band pairing to the use case for efficient and effective spectrum utilization. Fourth, because the D2D traffic is home-routed through the Indian MNO, data-sovereignty and lawful-intercept obligations are fulfilled within existing telecom compliance frameworks and done so by the local partner MNO, keeping the regulatory burden low while still safeguarding national interests. In short, LYNK's D2D solution offers India a pragmatic on-ramp that works with 3GPP devices people already carry, scales with future 3GPP devices, delivers resilience by design, and offers service flexibility via multiple frequency paths and orbits.

Therefore, local infrastructure requirements should not be imposed as a prerequisite for D2D services. Such mandates can materially affect deployment timelines and costs, especially where rules require duplicative in-country gateways, in-country network operations centers, or other fixed infrastructure even when the same policy outcomes can be achieved through home-routing and existing compliance frameworks. Where lawful intercept capability, emergency services integration, service quality, and consumer protection can be satisfied through the Indian MNO partner's established systems and regulatory obligations, prescriptive "in-country infrastructure first" requirements risk delaying deployment and increasing costs without proportionate public-interest benefits. TRAI can best support efficient rollout by setting outcome-based requirements and allowing operators flexibility in how those outcomes are met, rather than prescribing a particular physical architecture.

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

Three (3) market failures not addressed could materially erode the opportunities and benefits of D2D services.

First, duplicative handset type approval of devices already certified for terrestrial operation would delay deployment and increase regulatory burden without improving safety. For D2D via MSS spectrum, where handset-class NTN operates in MSS spectrum, conformity should follow standards-based self-declaration plus lab validation, not full re-certification just to connect with a satellite without any additional hardware to do so. For D2D via IMT spectrum, where the handset transacts through the partner MNO using terrestrial-band radios and 3GPP signaling, TRAI should recognize existing device approvals and MNO acceptance. The imposition of duplicative handset type approval/certification risks slower deployment, increased unnecessary regulatory burden, and decreased welfare and resiliency without any real upside.

Second, auctioning the MSS spectrum will have negative impacts on the marketplace and competition for a variety of reasons. One, the auction process makes acquiring spectrum and competing effectively more challenging, if not impossible, for new entrants and smaller companies, potentially stifling competition and innovation in the MSS spectrum. Historically, auctions failed to promote competition beyond established players in a market with significant financial resources because those players were able to bid large amounts for spectrum without a clear path to innovate and/or deploy a service in that spectrum. Two, the high costs associated with purchasing spectrum through auctions will ultimately be passed on to the consumers, resulting in higher retail prices. Three, more resources spent on



spectrum equals less investment in network infrastructure and service development and deployment. Regulators around the world have stated that auctions can be complex, time-consuming, and resource-intensive. Consequently, the increased expenses and stifled competition will hinder the rollout of MSS applications, such as D2D, in a competitive marketplace due to the financial burden associated with the spectrum costs inflated by the auctions. Adopting a satellite licensing framework in which multiple SNOs can efficiently and effectively compete in the market would avoid auctioning the MSS spectrum and be quick to authorisation, which better aligns incentives and preserves innovation. Auctioning MSS spectrum risks delayed or outright prohibited deployment of D2D services, reduced or no competition, and underutilized spectrum.

Third, imposing additional SNO regulatory approvals in IMT spectrum beyond MNO authorisation with non-exclusive agreements would recreate friction and enable de-facto monopolies if exclusivity in MNO-SNO pairing were allowed. TRAI should rely on MNO consent and prohibit exclusivity that forecloses competition. The risks for imposing additional SNO regulatory authorisations and allowing exclusive partnerships between MNOs and SNOs are delayed D2D deployment, reduced wholesale choice for MNOs, and slower diffusion of off-grid services.

Avoiding these three (3) failure points preserves the very benefits and market opportunities D2D services will unlock—*e.g.*, rapid coverage extension, enterprise productivity, and national resilience—across both MSS and IMT spectrum.

9. 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.**

All four categories should be permitted within the scope of the SCN authorisation, subject to the service provider holding the appropriate underlying service authorisation and spectrum rights. FSS and MSS are core satellite services and should be included because SCN infrastructure may support fixed, mobile, wholesale, enterprise, government, backhaul, IoT, and resilience use cases. D2D is an application of the MSS that is deployed as a service via MSS spectrum and/or IMT spectrum.

- D2D via MSS spectrum should be permitted because it is an emerging application of MSS that allows satellite networks to extend connectivity directly to ordinary devices. India should adopt an efficient satellite licensing framework that enables qualified SCN entities to provide D2D services in MSS spectrum without auctions, duplicative handset approvals, or unnecessary local-infrastructure mandates.
- D2D via IMT spectrum should be permitted as a separate satellite-enabled use case, but only where the relevant access service provider/MNO authorizes the SCN entity to use its licensed IMT spectrum in the applicable LSAs. The framework should be light-touch and should recognize that an MNO's exclusive IMT spectrum rights may include non-exclusive, secondary use by an SCN entity with the MNO's consent and agreed technical guardrails. The SCN use should be secondary on a non-interference, non-protected basis that is subject to the MNO's technical and operational control.

This approach keeps FSS and MSS available for traditional, evolving, and emerging satellite services, enables both D2D spectrum pathways, protects terrestrial networks, and allows SCNs to support India's connectivity, resilience, and public-interest objectives.

See responses to Q18 (D2D via MSS spectrum) and Q19 (D2D via IMT spectrum).



10. 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.

D2D via IMT spectrum should be permitted at this stage, and for D2D to be successfully implemented in India, TRAI should:

- (A) allow D2D in IMT spectrum via authorised partnerships with Indian MNOs so that the MNO remains accountable for retail service obligations while the satellite link complements coverage without requiring additional authorisation;
- (B) allow D2D in MSS spectrum through a clear market-access or landing-rights pathway; and
- (C) keep authorisations adaptable such that India can quickly incorporate the eventual WRC-27 Agenda Item 1.13 technical conditions (including terrestrial IMT protection and cross-border coordination expectations) without re-structuring its domestic framework.

The most important WRC-23 outcome for D2D operations is the adoption of Agenda Item 1.13. That agenda item established by Resolution 253 (WRC-23) tasks ITU-R to conduct studies on possible new MSS allocations for direct connectivity between space stations and IMT user equipment to complement terrestrial coverage, across the 694/698 MHz to 2.7 GHz range. For D2D providers like LYNK, this WRC-23 outcome is foundational because it is the clearest international signal that D2D will be addressed through harmonized technical/regulatory conditions rather than ad hoc national approaches, which is critical for handset ecosystem scale and cross-border consistency. Furthermore, additional MSS spectrum would allow D2D service providers to bring more seamless, data-heavy, capacity to end-users in India.

A second WRC-23 outcome that matters for D2D (even though it is not “D2D-labeled”) is WRC-23’s set of mobile/IMT outcomes that maintain and refine the terrestrial baseline that D2D must protect and complement. In particular, WRC-23 outcomes under agenda items addressing IMT identifications and related conditions (e.g., Agenda Items 1.3 and 1.5 as summarized in WRC-23 outcomes materials) reaffirm that terrestrial IMT remains the primary use case in relevant bands, subject to country and region-specific conditions and protections. That is directly relevant to D2D via IMT spectrum as it clarifies what “non-interference” and “complementary coverage” should mean in practice: D2D operations should be engineered and authorised under conditions that preserve terrestrial IMT performance and comply with applicable national footnotes and regulatory provisions associated with those IMT identifications.

Notably, there are several gaps in implementing the WRC outcomes that make it unnecessary to wait for the WRC outcomes to then examine permitting D2D via IMT spectrum.

- The first gap is the WRC-23 established the direction for D2D but did not itself create a detailed domestic authorisation framework for integrating D2D services. Agenda Item 1.13 through Resolution 253 (WRC-23) initiated ITU-R studies on possible additional MSS allocations for direct connectivity between space stations and IMT user equipment in the 694/698 MHz to 2.7 GHz range to complement terrestrial IMT coverage. Consequently, until WRC-27 concludes, the practical “gap” for India is therefore not an ITU regulatory problem, but a domestic implementation pathway problem—i.e., whether India has a clear, predictable mechanism to allow D2D (especially D2D via IMT spectrum) to operate lawfully via MNO partnerships, without forcing D2D into ill-fitting categories designed for either conventional terrestrial networks or traditional MSS retail models.
- The second gap is the lack of nationally-specified technical guardrails that are flexible enough to map cleanly to any decision under ITU-R Study Agenda Item 1.13. The ITU-R work program places primary responsibility on Working Party 4C (MSS) in close collaboration with Working Party 5D (IMT), and explicitly ties the Agenda Item 1.13 studies to IMT frequency

arrangements (*e.g.*, Recommendation ITU-R M.1036). For India, the most useful clarifications may include: the interference-protection framework applicable for D2D via the additional IMT spectrum (*e.g.*, how D2D link budgets, duty cycle, and PFD constraints will be evaluated against terrestrial IMT protections); the coordination expectations between the D2D SNO and Indian MNOs (including how MNO spectrum rights are used for D2D); and an interim “safe-harbor” approach for trials and early service phases that is consistent with the direction of Agenda Item 1.13—so India can permit early deployment without locking in requirements that later diverge from WRC-27 outcomes.

- The third gap is operational and compliance alignment. These are the domestic rules that determine who is accountable for D2D service delivery, compliance with lawful process, and user protections while the ITU studies mature. This includes clarifying: whether India expects D2D to be offered to the end user through Indian MNOs (the model that best preserves existing subscriber relationships and compliance mechanisms—see response to Q1); how India treats routing architecture for D2D traffic (*e.g.*, permitting home-routing to the MNO core as a compliance-enabling option, rather than mandating local breakout or local gateways in all cases); and how India will handle cross-border realities of satellite coverage (*e.g.*, market access/authorisation triggers and coordination handling) in a way that remains adaptable to the eventual Agenda Item 1.13 framework and any associated procedural concepts discussed in ITU preparatory materials.

Lynk’s proposed regulatory path for D2D via IMT spectrum and D2D via MSS spectrum addresses these gaps while maintaining a flexible regulatory environment for implementation of WRC outcomes.

See responses to Q18 (D2D via MSS spectrum) and Q19 (D2D via IMT spectrum).

11. 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.

D2D can be provided via two mechanisms—*i.e.*, D2D via MSS spectrum and D2D via IMT spectrum—so the spectrum holdings should match the spectrum utilization. For D2D via MSS spectrum, the spectrum holding should be held by the SNO and a commercial agreement with the MNO partner for the SNO to provide D2D services to MNO partner’s end users (customers). For D2D via IMT spectrum, the spectrum holding should be held by the MNO partner and a commercial agreement made with the SNO for the SNO to provide D2D services per that agreement.

Accordingly, the framework should permit at least Combinations 1 and 2, because those combinations align with the two D2D spectrum pathways. For D2D via MSS spectrum, the SCN authorised entity should hold the spectrum rights for both the feeder link and the MSS user link, so Combination 1



should be permitted. In that model, the SCN entity operates the satellite network and provides wholesale D2D capability to authorised service providers. For D2D via IMT spectrum, the SCN authorised entity should hold or control the feeder link spectrum, while the partnering access service provider/MNO holds the IMT user-link spectrum and authorizes the SCN entity to use that spectrum in the relevant LSAs, which corresponds to Combination 2.

Conversely, Combinations 3 and 4 should not be required for D2D services and should not be treated as the default model. The feeder link is a satellite-network function used between the satellite system and ground infrastructure, and it should normally remain under the SCN entity's control so the satellite network can be managed efficiently, securely, and without harmful interference. Requiring the partnering service provider to hold feeder link spectrum would add unnecessary complexity and could force duplicative and/or costly infrastructure or non-standard network arrangements. If India permits Combinations 3 or 4 for other satellite use cases, it should do so only where the parties can demonstrate clear technical accountability, coordination, and compliance. For D2D, however, Combination 1 supports D2D via MSS spectrum, and Combination 2 supports D2D via IMT spectrum.

See responses to Q18 (D2D via MSS spectrum) and Q19 (D2D via IMT spectrum).

12. 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.

SCN authorised entities should be eligible to hold spectrum in both FSS and MSS frequency bands, depending on the function being performed. FSS spectrum should be available for feeder links, gateway links, TT&C where applicable, and other satellite network connectivity between the space segment and ground infrastructure. MSS spectrum should be available for mobile satellite services, including D2D via MSS spectrum, where the SCN entity uses harmonized MSS bands to provide wholesale satellite capability to authorised telecom service providers. The framework should be technology-neutral and should not limit SCN authorisation to only one satellite allocation where the network architecture requires both feeder link and user link spectrum.

For D2D, India should preserve two complementary pathways.

- D2D via MSS spectrum should be supported through assignment or authorisation of MSS spectrum to qualified SCN entities, without auctions, duplicative handset approvals, or unnecessary local-infrastructure mandates. This pathway leverages harmonized MSS allocations (notably L-band and S-band) and provides additional propagation and coverage advantages in certain scenarios.
- D2D via IMT spectrum should not require assignment of IMT spectrum to the SCN entity. Instead, the relevant access service provider/MNO should continue to hold the IMT spectrum, and the SCN entity should be permitted to use that spectrum only with the MNO's consent, in the relevant LSAs, and on a secondary, non-interference, non-protected basis. This pathway leverages the existing device ecosystem and the MNO's spectrum rights and policy control.

This approach enables FSS feeder links, MSS user links, and MNO-authorised IMT user links to work together without duplicative regulation, while protecting terrestrial networks and allowing D2D to complement existing mobile services and supplement them with enhanced capabilities. LYNK's services complement and supplement rather than compete with existing MNO offerings both by design and by contract. For D2D via MSS bands, licensing is separate from terrestrial IMT authorisations, and

the D2D services provide supplementary coverage that extends MNO coverage into areas where its spectrum does not promulgate well whilst providing continuity during terrestrial outages. MNOs remain the customer interface through wholesale or co-branded retail. For D2D via IMT bands, all operations of the D2D services occur under the MNO's spectrum rights and policy control. The MNO consents to activation, retains PLMN identity and billing/roaming relationships, and can meter or prioritize satellite-served sessions just as it does terrestrial ones. In both cases, D2D fills structural coverage gaps (remote land, maritime, disaster-affected zones), supplies emergency reach and public-warning channels, and offers terrestrial coverage augmentation where economically rational—helping the MNOs fill out their service footprints and resilience without displacing terrestrial services or disrupting competitive dynamics. Consequently, such enablement avoids artificial bottlenecks and lets India benefit from innovation and competition while protecting incumbent services.

See responses to Q18 (D2D via MSS spectrum) and Q19 (D2D via IMT spectrum).

13. 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.

For NGSO-based FSS and GSO/NGSO-based MSS, TRAI's satellite spectrum assignment framework should apply to SCN authorised entities, with limited SCN-specific modifications. The framework should support SCNaas, wholesale satellite network operations, feeder links, user links, and hybrid satellite-terrestrial deployments. It should remain technology-neutral and should avoid duplicative service-layer requirements, unnecessary local infrastructure mandates, or rigid network architecture rules. For D2D via MSS spectrum, qualified SCN entities should be able to obtain MSS spectrum assignments under an efficient satellite licensing framework without auctions, duplicative handset approvals, or mandatory local gateways where the same regulatory outcomes can be met through other compliance measures. For D2D via IMT spectrum, no IMT spectrum should be assigned to the SCN entity. The relevant MNO should continue to hold the IMT spectrum, and the SCN entity should use that spectrum only with the MNO's consent, in the relevant LSAs, and on a secondary, non-interference, non-protected basis.



Across all FSS and MSS assignments, the framework should focus on clear eligibility, transparent spectrum access, interference management, coordination, security compliance, and proportionate reporting. It should not require in-country gateways, PoPs, Pols, network operations centres, or other fixed infrastructure as universal prerequisites. Those elements should be permitted where commercially or operationally justified, but not mandated where lawful interception, emergency services, cybersecurity, consumer protection, data sovereignty, and service oversight can be achieved through home-routing, partner MNO systems, secure interfaces, or other equivalent compliance measures. This approach preserves national regulatory objectives while enabling timely SCN and D2D deployment.

See response to Q7.

14. 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.

The single most impactful policy change would be for TRAI to adopt a clear, technology-neutral, D2D market access framework that explicitly enables D2D services through Indian MNO partnerships (including D2D via MSS bands through a predictable satellite authorisation framework and D2D via IMT spectrum by MNO agreement), with outcome-based obligations rather than prescriptive architecture mandates—see response to Q7. In practice, that means: no auction-style barriers for MSS, no duplicative handset approvals for standard 3GPP devices, and no blanket requirements for in-country gateways or network operations centers where the same national objectives (*e.g.*, lawful intercept, emergency services integration, consumer protection, and security) can be achieved through home-routing to the Indian MNO core and existing compliance frameworks. This fundamental policy approach would reduce regulatory uncertainty, accelerate D2D deployments, and attract investment by making India an attractive place for SNOs to launch interoperable D2D services that complement terrestrial coverage. Specifically for MSS spectrum, it is important to recognize ITU filing priority to ensure that there is a larger harmonized service (per SNO) globally. Therefore, D2D regulations should take a light touch approach, encouraging swift deployment and discouraging exclusive commercial relationships between MNOs and SNOs—see responses to Q1-8, Q18 (D2D via MSS spectrum), and Q19 (D2D via IMT spectrum).

15. 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.

See response to Q14.

16. 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.



Lynk supports enabling these arrangements, but the framework should be light-touch and should not require a separate reassignment of spectrum, duplicative authorisation, or unnecessary local infrastructure—see responses to Q1-8, Q18 (D2D via MSS spectrum), and Q19 (D2D via IMT spectrum). The spectrum-holding service provider should remain responsible for compliance with the terms of its FSS or MSS spectrum assignment. The SCN entity should be permitted to use that spectrum only with the spectrum holder’s consent and only within the scope of the spectrum holder’s authorisation. The agreement should address the frequencies, geography, duration, service scope, interference management, operational control, security, lawful interception support, emergency service support, reporting, suspension, termination, and responsibility for regulatory compliance. These terms should be commercially negotiated, with only minimum regulatory guardrails to ensure accountability and prevent harmful interference.

Regarding D2D services, the framework should preserve the distinction between MSS and IMT spectrum. For D2D via MSS spectrum, the SCN entity should preferably be able to obtain its own MSS spectrum assignment, but it should also be permitted to provide SCNaaS using MSS spectrum held by a partnering authorised service provider where the parties agree and regulatory accountability is clear. For D2D via IMT spectrum, this same principle already applies: the MNO holds the IMT spectrum, and the SCN entity uses it only with the MNO’s consent, in the relevant LSAs, on a secondary, non-interference, non-protected basis. However, the SCN should not need any additional regulatory authority to utilize the IMT spectrum as the regulatory and operational controls are held by the MNO partner. This approach allows flexible partnership models, avoids duplicative regulation, protects the spectrum holder’s rights, and supports timely deployment of satellite services without forcing one ownership model for every network.

17. 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.

See response to Q16.

18. 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.

TRAI should adopt an expedient satellite licensing framework that promotes the introduction of D2D via MSS spectrum in a timely fashion, avoids burdensome and duplicative requirements, and recognizes 3GPP NTN profiles (*e.g.*, n255/n256) as the standards baseline. First, auctioning the MSS spectrum will create an unjustifiably high barrier to entry for newer and/or smaller SNOs and unfairly advantage larger, established SNOs, divert capital from service rollout, and risk underutilization of the spectrum. Instead, a merit-based licensing framework here most effectively addresses service costs, market concentration, fair competition, optimal spectrum utilization, and the specific needs of diverse users, while leaving room for practical engineering choices (*e.g.*, class-based EIRP limits for handhelds versus car kits, drones, maritime and IoT terminals) as contemplated by regulators around the world. Second, TRAI should explicitly recognize handset-class D2D via MSS spectrum and reference the 3GPP NTN standards as acceptable device/radio profiles. Third, TRAI should confirm no duplicative handset type-approvals and authorisations for devices already approved for terrestrial use, and use standards-based self-declaration with targeted lab validation if/when future handsets add the MSS spectrum.



Fourth, TRAI should codify that D2D traffic may be home-routed through India MNO cores to satisfy any emergency, lawful-intercept, and data-sovereignty requirements, which is an approach consistent with international moves to enable D2D services. Fifth, India should recognize ITU filing priority to ensure that there is a larger harmonized service (per SNO) globally. This regulatory framework preserves innovation and competition while accelerating deployment of D2D via MSS spectrum.

TRAI should prioritize MSS spectrum that already anchors the handset-class 3GPP NTN ecosystem—*e.g.*, 1525-1559 MHz and 1626.5-1660.5 MHz (“L-band”) and 1980-2010 MHz and 2170-2200 MHz (“S-band” or “2 GHz MSS Bands”)—because the L-band and S-band combine global harmonization, proven link budgets to ordinary smartphones, and clear regulatory trajectories in major markets. Release-17 codifies these MSS bands for NR-NTN and NB-IoT-NTN, creating immediate interoperability benefits for device and chipset roadmaps. Multiple regulators around the world are actively updating the 2 GHz MSS Bands to accommodate both the introduction of D2D and supplement D2D services via IMT spectrum in their countries. All of which signals continuity for investments in MSS spectrum that Indian MNOs can leverage. For implementation, TRAI should prioritize the S-band and L-band simultaneously. S-band merits near-term emphasis for its scale-and-capacity capability, enabling richer NR-NTN services and leveraging pan-regional harmonization in the 2 GHz MSS Bands. In parallel, L-band merits near-term emphasis for its propagation profile—*e.g.*, superior rain-fade resilience, improved penetration and diffraction, and milder Doppler Shift for low-EIRP, low-G/T handset links—that maps directly to the unserved and underserved Indian environments. 3GPP 5G NTN waveforms should be used for orthogonality and coordination, enabling rapid deployment while increasing resilience goals and eliminating the likelihood for harmful interference. This parallel approach ensures D2D robustness, time-to-service, increased capacity, and evolvability as well as maximizes consumer welfare, de-risks execution, and improves supplemental terrestrial mobile services. Moreover, this approach is consistent with international regulatory trajectories while retaining flexibility for Indian spectrum holdings and national-security requirements. Prioritizing the L-band and S-band for D2D services, as well as considering flexible use of additional bands as demand requires, positions TRAI to tap into economies of scale while maintaining technology-neutrality in future licensing.

To ensure efficient and effective use of the MSS spectrum, TRAI should utilize the 3GPP standard for 5G NTN as the framework for segmenting the MSS spectrum. The 3GPP standards body already adopted the L-band into the 5G NTN standards as NR band n255 and the S-band as NR band n256. The 5G NR waveform is for use cases such as mass-market handset and cellular devices (*e.g.*, smart phones) with an established minimum carrier bandwidth of 5 MHz for the L-band and S-band.

Considering that there are a number of SNOs focused on providing future 5G NR services, a framework that segments the MSS spectrum to support 5G NTN waveform standards is in the interest of India. Notably, 3GPP 5G NTN primary air interface waveform standards are compatible with a band segmentation framework. The following analysis will explore both the minimum bandwidth required for the 3GPP 5G NR waveform standard and the minimum bandwidth sufficient for mobile broadband services.

First, the minimum bandwidth for a 5G NR waveform supported service is five (5) MHz, which is the smallest spectrum block that one operator can use. An operator with a five (5) MHz block would deploy 4.5 MHz of utilized spectrum organized into twenty-five (25) physical resource blocks (“PRB”) each nominally being 180 kHz wide, and the operator would reserve a 250 kHz guard band on each side of the utilized bandwidth. For a multi-beam satellite system, the use of a single five (5) MHz block would require fractionating the spectrum in the time and/or frequency domain—*e.g.*, temporal “beam hopping” or fractional frequency re-use, both of which are defined in the 3GPP standard. For example, fractional frequency re-use within the five (5) MHz block is useful for avoiding beam-to-beam interference within an operator’s system while either uniformly, or non-uniformly, distributing capacity

across beams. If an operator were to uniformly distribute capacity across satellite beams, the operator may choose to deploy a fractional frequency re-use pattern of three (3), where one-third of all beams use eight (8), or nine (9), co-channel PRBs, resulting in the average beam being capable of supporting approximately 1.5 MHz of effective capacity (*i.e.*, 4.5 MHz divided by 3 equals 1.5 MHz). Depending on the system design and resulting signal to noise ratios of servicing signals, spectral efficiencies for each beam may range between two (2) and four (4) bps/Hz, offering three (3) to six (6) Mbps per beam/cell deployed in this uniformly distributed manner. Consequently, such deployment would be sufficient for light data, messaging, and limited voice services, but it will not be sufficient for mobile broadband services.

To sufficiently support a minimal mobile broadband service, one SNO would need at least ten (10) MHz of bandwidth. In this case, the SNO would deploy nine (9) MHz of utilized spectrum and reserve a 500 kHz guard band on each side of the utilized bandwidth. Deploying a uniform fractional frequency re-use pattern of three (3)—where one-third of all beams use sixteen (16) or seventeen (17) co-channel PRBs—would yield approximately three (3) MHz of effective bandwidth per beam/cell deployed and result in approximately six (6) Mbps to twelve (12) Mbps per beam/cell deployed. Non-uniform fractional frequency re-use patterns could increase these data rates in areas where demand density is higher and reduce these data rates in areas where demand density is lower. Accordingly, a satellite operator authorised a ten (10) MHz or more block of spectrum could introduce mobile data broadband capabilities in the MSS spectrum. Moreover, a SNO's use of the IMT spectrum in collaboration with and under the direction of an MNO partner for its D2D services in India would supplement a SNO's authorisation in the MSS spectrum, further increasing the capacity for the authorised SNO. Because IMT spectrum will likely continue to be shared between terrestrial networks and D2D service providers on a co-channel basis, necessitating detailed coordination of the shared IMT spectrum and its deployment, the combined use of the MSS and IMT spectrum is crucial for deployment and seamless connectivity for the end user.

Therefore, while more spectrum authorisation is better for the deployment of D2D services, the following band segmentation option (as an example of the 2 GHz MSS Bands) accommodates more SNOs and different services all while making more efficient use of the MSS spectrum:

- 5G NR Operator 1 = 2x10 MHz
- 5G NR Operator 2 = 2x10 MHz
- 5G NR Operator 3 = 2x10 MHz

Hence, the key to efficient and effective use of the MSS spectrum is the incorporation and utilization of the 3GPP standard for 5G NTN as the framework for segmenting the MSS bands. For the provision of D2D services, more spectrum is best, but LYNK's proposed example for the MSS spectrum illustrates efficient spectrum segmentation with effective spectrum management all while opening up the spectrum to competition and a variety of MSS applications, including highly capable D2D services.

Appropriately, TRAI should adopt the implementation of the spectrum management techniques in the 3GPP standards for the following reasons. One, they are existing standards that are successfully utilized for efficient spectrum use by terrestrial IMT operators. Two, 3GPP OFDM waveforms generally offer high spectrum efficiency with limited guard band waste, assuming that the out of band emissions and ACLR performance metrics are sufficiently specified and achieved. Lastly, three, employing the 3GPP standards, which specify how the spectrum will be used and deployed, minimizes, if not completely eliminates, the need for coordination between authorised operators using the MSS spectrum.



- 19. 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?**

For D2D via IMT spectrum, TRAI should expressly recognize, that the MNO’s exclusive use of the spectrum authorised to it includes secondary use of the spectrum by third parties, and that such secondary use be non-exclusive and proceed without additional regulatory intervention beyond MNO authorisation and agreed technical guardrails. This light-touch approach allows existing D2D operators to move expeditiously with their MNO partners to deploy nationwide mobile services and minimizes regulatory burden. LYNK’s extensive experience with regulators around the world proves that this D2D regulatory framework strikes a balance between innovation, market development, and consumer benefits whilst providing a strong foundation for deploying these services and enhancing the reliability and resilience of telecommunications services, encouraging investment in the evolution of wireless networks, and paving the way for the development of innovative and emerging applications. Moreover, this light-touch posture reflects that D2D complements and enhances the current terrestrial network infrastructure, delivers immediate resilience and public-warning benefits, and scales with future 3GPP devices. Therefore, LYNK encourages TRAI to take a light-touch approach to regulating D2D via IMT spectrum by explicitly recognizing that MNOs can permit and manage secondary use of the spectrum exclusively authorised to them without requiring additional SNO authorisation to deliver D2D services. See responses to Q8 and Q19(b-e).

As to technical parameters that should be considered for D2D coordination, LYNK recommends TRAI focus on a concise set of measurable “guardrails” rather than mandating a particular architecture. For D2D via IMT spectrum, the primary coexistence focus is protecting the terrestrial component of IMT. LYNK recommends conservative coexistence conditions, including secondary status to terrestrial IMT, operation only with MNO agreement, and aggregate field-strength or PFD-based safeguards with geo-temporal coordination integrated with the MNO partner.

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

TRAI should open the IMT spectrum—*e.g.*, 617-960 MHz and 1525-2690 MHz—to D2D under a single, light-touch regulatory approach that treats satellite D2D as a complementary layer operated by agreement with a local partner MNO and on a secondary, non-interference, non-protected basis to terrestrial services. Enabling D2D in the IMT spectrum concurrently, instead of one band at a time, avoids artificial bottlenecks, lets operators match propagation to use case, accelerates ecosystem scale without picking winners, and provides flexibility to MNOs for partnerships and spectrum utilization. For example, the IMT bands below 1 GHz maximize reach and potential indoor penetration for lifeline messaging and voice, while the IMT bands above 1 GHz add transport corridor, suburban, and metropolitan capacity where reuse is particularly valuable. The current frequency division duplex (“FDD”) structure and large device installed base across all proposed IMT spectrum reduce coexistence complexity. As technologies improve, time division duplex (“TDD”) will also provide significant capability and benefit to the end user while also reducing coexistence complexity. The 3GPP NTN signaling provides a migration path for PLMN selection, paging, and emergency integration as D2D capabilities mature.



Implementation should be market-led and regulated proportionately. The regulatory environment should acknowledge the MNO's exclusive access to the spectrum and its right to permit non-exclusive secondary use of that spectrum with nothing more. Under this framework, any SNO could operate in any of the IMT frequencies in India where it has an executed agreement with a locally licensed MNO that covers the D2D use of the MNO's authorised spectrum. MNOs could choose bands dynamically by locality—*e.g.*, coverage-first in rural and maritime areas using IMT bands below 1 GHz, and capacity-oriented augmentation with IMT bands above 1 GHz in towns and transport corridors—without additional regulatory gating. Furthermore, MNOs could facilitate supplemental coverage for their end users through one or more SNOs with D2D services across the IMT bands while maintaining flexibility in managing the utilization of its spectrum. Hence, this unified, pro-innovation stance modernizes beyond the “one-band-at-a-time” paradigm while maintaining terrestrial primacy in the IMT spectrum, and a light-touch regulatory approach to D2D in IMT spectrum allows D2D operators to move expeditiously with MNO partners to deploy nationwide mobile services

(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).

Modification of the NFAP to include MSS on a secondary basis in the proposed IMT bands—see response to Q19(b)—can be quite helpful to facilitate the D2D via IMT spectrum. Such allocation should be specified on a non-interference, non-protected basis to primary allocations in these IMT bands—see response to Q19(a).

(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?

The cross-border coordination issues that most affect D2D services result from when satellite beams and handset attach attempts go beyond national boundaries. In IMT bands, the primary cross-border risk is harmful interference to terrestrial IMT networks in neighboring countries, especially near land borders and coastal areas where a D2D beam can illuminate multiple jurisdictions, and where the same band is intensively used by terrestrial operators. In parallel, regulators can face “jurisdictional leakage” concerns—*i.e.*, devices physically in one country attempting to access D2D services from an SNO lacking domestic authorisation. LYNK finds these issues are best addressed with objective technical guardrails and service-level controls, not by “policing devices at the border.” Indeed, the international study track for D2D (including cross-border interference) is already being advanced under WRC-27 Agenda Item 1.13.

TRAI can address cross-border D2D issues with a practical two-layer approach: border-area interference coordination rules, and authorisation-based service controls. LYNK designed its D2D MSS system to operate in the same manner as terrestrial MNOs, including cross-border coexistence. By way of example for the interference layer, stations operating in the frequency bands 824-849 MHz and 869-894 MHz and located less than 72 km from the Canada-U.S. border must adhere to the spectrum sharing arrangement between Canada and the United States of America for cross-border coexistence, which states that the PFD at the ground level produced by a station in the other country's territory shall not exceed -102 dBW/m² in any 200 kHz bandwidth unless the licensees in adjacent cross-border licensing areas and the responsible government agencies agree to a higher acceptable threshold. A similar idea could be adopted for D2D via IMT spectrum, where the center of an SNO's D2D beam less than 72 km away from the border could be coordinated if the relevant threshold cannot be met. For



the authorisation layer, LYNK recommends regulating the service “in the network.” The SNO lacking in-country authorisation to provide D2D services (*e.g.*, in MSS spectrum) should be required to geofence and technically deny origination/termination of D2D service to devices located in-country, while authorised SNOs may serve devices normally (and ideally through local MNO partnerships with home-routed traffic).

(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.

LYNK supports Option (iii): an alternative, light-touch framework that permits D2D via IMT spectrum in one or more LSAs through non-exclusive arrangements between one or more MNOs and one or more SNOs. Successful deployment of D2D via IMT spectrum does not require a single MNO to hold the relevant IMT frequency channel in all twenty-two (22) LSAs, nor does it require multiple MNOs collectively to cover all twenty-two (22) LSAs before service can begin. Instead, a SNO should be permitted to provide D2D service in any LSA where the local MNO partner holds the applicable IMT spectrum rights and authorizes use of that spectrum for D2D. This LSA-by-LSA approach avoids unnecessary deployment delays, preserves MNO flexibility, and allows D2D coverage to scale progressively across India.

Neither of the proposed methods (i) or (ii) are necessary to ensure interference-free operation of D2D via IMT spectrum. As LYNK proposes, there will be no increased risk of harmful interference from the introduction of satellite-based D2D via IMT spectrum. Since the partner MNO has exclusive access and control over the IMT spectrum authorised to it, the MNO will manage the secondary use of that spectrum. D2D services should be positioned to existing cellular services as complementary in IMT spectrum and supplementary in MSS spectrum. In IMT spectrum, D2D services extend each MNO’s reach with the same SIM, number, and customer experience when terrestrial coverage drops. In MSS spectrum, D2D services add coverage, capacity, and resilience for areas where neither terrestrial services nor D2D via IMT spectrum can reach. This framing keeps D2D services from competing with cellular and instead makes it an extension that preserves the primacy of terrestrial networks.

In LYNK’s system, all D2D traffic is handled by the MNO’s core network locally in India. Since the satellite architecture is a home-routed roaming architecture, the MNO’s national infrastructure for traffic routing, billing, etc. controls the mobile traffic. LYNK cannot route that traffic because the partner MNOs’ subscribers are essentially inbound roaming subscribers on LYNK’s D2D service. Consequently, the local MNO maintains control over which of its subscribers can utilize the D2D service. For instance, if the user equipment or the subscription is not authorised by the partner MNO for roaming onto LYNK’s



satellites, then the registration attempt by the user equipment to LYNK's satellites is denied. Conversely, if the user equipment or subscription is authorized by the partner MNO to roam onto LYNK's network, then when the MNO terrestrial signal is nonexistent, the mobile devices of the MNO's subscribers roam onto and register with LYNK's satellites. LYNK's D2D architecture is a roaming architecture that verifies subscriptions and authenticates mobile devices through standard network signaling queries between LYNK's core network elements and the partner MNO's network. As an example for LTE, the mobile device authentication and subscription verification is accomplished between LYNK's mobile management entity and the partner MNO's home subscriber server through a secure roaming IP exchange connection via the s6a Diameter interface. Similarly, the user traffic is managed between LYNK's feeder link gateway and the partner MNO's packet data network gateway and then onto the partner MNO's IP multimedia subsystem core. Therefore, the partner MNO has full visibility and ability to route the traffic the same way it currently handles traffic when its subscriber is roaming on another terrestrial network.

20. Whether there are any other inputs or suggestions with respect to the delivery of D2D services via satellite through SCNs established by the proposed SCN authorized entities? Kindly provide a detailed response with justification.

TRAI can enable deployment of D2D services quickly with a simple framework that defines roles and how spectrum is used.

- MNOs should remain the retail providers that handle billing, complaints, lawful intercept, and emergency services.
- SNOs should provide the satellite radio access and the space and ground segment as wholesale.
- In MSS bands, authorize D2D to operate under the SNO's satellite filings and landing rights, and ensure non-exclusive commercial access for qualified MNOs.
- In IMT bands, allow D2D under each MNO's existing license on a secondary, non-interference, non-protected basis with no new spectrum grant nor duplicate handset approvals and on a non-exclusive basis.

This division of roles and spectrum rules enables rapid launch while protecting existing services.

Strong safeguards should keep sovereignty, interoperability, and consumer protection intact.

- All D2D traffic should be home-routed through Indian MNO cores to preserve national control.
- Require alignment with 3GPP NTN on the air interface so mobile 3GPP devices work from day one without any additional hardware.
- Manage coexistence in IMT bands through MNO-controlled emission and field-strength envelopes, and in MSS bands through ITU-compliant coordination.
- Ban exclusive MNO-SNO partnerships and encourage multiple SNO and MNO partnership pairings to keep the market competitive—more on this in the following paragraphs.

These safeguards keep the service familiar to users and aligned with national priorities.

When the same satellite system serves multiple Indian MNOs, D2D launch is faster and cheaper with a couple of trade-offs. Since a single regenerative payload can produce logical "cells" per PLMN and interwork with each MNO over standard roaming links, then each subscriber's traffic is home-routed to that MNO's core for authentication, policy, billing, legal intercept, and emergency integration—*i.e.*, every MNO keeps full control of its users and data sovereignty is preserved. This is exactly how LYNK's system is designed, which is operationally identical to inbound roaming. The main trade-offs are shared-payload capacity and QoS isolation. The SNO needs per-MNO admission control/scheduling and careful band use (especially in IMT spectrum) to avoid self-interference and protect terrestrial operations. In very early phases, a single spacecraft can be a temporary single point of failure, but this



is mitigated by constellation deployment (and in LYNK's case, quickly mitigated and supplemented with LYNK's multi-orbit solution—see Introduction and response to Q1).

Likewise, one MNO incorporating multiple SNOs' D2D services has its pros and cons. Access to multiple SNOs' D2D services increases resilience (*e.g.*, orbit/vendor diversity), expands geographic reach, and raises aggregate capacity, while keeping the same operational model because subscriber authorisation and all user-plane traffic remain anchored in the MNO's own core. However, this adds more roaming peerings and policy orchestration (*e.g.*, KPIs and priority classes) to manage, but these consequences are manageable within standard roaming and IPX frameworks. LYNK's multi-orbit solution (LEO access with MEO/GEO transport/backhaul as needed) further helps with routing during disasters or demand spikes without changing the MNO-centric control plane.

LYNK's D2D system utilized by multiple MNOs is operationally identical to inbound roaming. LYNK configured its D2D system to present separate logical PLMN attachments for each participating MNO, while keeping authentication, policy, billing, emergency services, and lawful intercept entirely home-routed through each MNO's core. Concretely, the handset registers to the satellite's regenerative RAN (on-board eNodeB/NR with core elements), the control plane authenticates against the MNO's HSS/UDM over standard roaming interfaces (*e.g.*, Diameter S6a / 5G SBA via IPX), and the user plane is returned to the MNO's PGW/UPF/IMS so that the MNO retains full subscriber control and data sovereignty. For D2D via IMT spectrum, sharing is by MNO agreement (*i.e.*, non-exclusive, secondary use) and requires coordination with the MNO(s) holding the band to avoid harmful interference to terrestrial cells. For D2D via MSS spectrum, normal satellite licensing applies and the same home-routed model is used. Per-operator separation is thus achieved in the network layer (distinct roaming peerings, APNs/policies, local regulatory triggers, billing, etc.) rather than by duplicating space assets, while spectrum coexistence is ensured via emissions controls and coordination where relevant but widely mitigated with the incorporation of 3GPP standards.

See responses to Q18 (D2D via MSS spectrum) and Q19 (D2D via IMT spectrum).

21. Any other inputs or suggestions related to the use of spectrum on SCNs established by the proposed SCN authorised entities may be submitted with proper explanation and justification.

LYNK recommends that the spectrum framework for SCNs remain flexible, technology-neutral, and non-duplicative. SCN authorised entities should be permitted to use FSS spectrum for feeder links and satellite network connectivity, MSS spectrum for MSS user links including D2D via MSS spectrum, and MNO-authorised IMT spectrum for D2D via IMT spectrum.

- For D2D via MSS spectrum, qualified SCN entities should be able to obtain MSS spectrum access through an efficient satellite licensing framework without auctions, duplicative handset approvals, or unnecessary local-infrastructure mandates.
- For D2D via IMT spectrum, the MNO should remain the spectrum-rights holder, and the SCN/SNO should operate only with the MNO's consent, in the relevant LSAs, on a secondary, non-interference, non-protected basis. No separate IMT spectrum assignment to the SCN entity should be required.
- FSS feeder-link spectrum should be available where needed to support either model.

These pathways should be treated as complementary, not mutually exclusive. More available spectrum and more flexible spectrum access will improve capacity, coverage, resilience, and service quality, particularly in rural, remote, maritime, disaster-affected, and underserved areas.

Moreover, the framework should avoid rigid network architecture requirements. Local gateways, local PoPs, local NOCs, or other in-country infrastructure should not be universal prerequisites where lawful interception, emergency services, cybersecurity, consumer protection, data sovereignty, and service



oversight can be satisfied through home-routing, the Indian MNO core, secure interfaces, or equivalent compliance measures—see response to Q7. MNO-SNO partnerships should be non-exclusive, spectrum use should be subject to clear technical guardrails, and regulatory oversight should focus on outcomes—*e.g.*, interference protection, security, service continuity, lawful compliance, and efficient spectrum use. This approach will allow SCNs to support India’s connectivity goals while protecting terrestrial networks and encouraging timely D2D deployment.

22. Regarding the agreement between SCN Authorised entity and a Service Authorised entity providing FSS/ MSS to the end user, for provision of SCNaaS to the Service Authorised entity, which may or may not include provisions for utilisation of FSS/ MSS spectrum assigned to the Service entity, is there a need to regulate charges exchanged between the two entities under such an agreement? If yes, what would be the possible parameters, including SLA parameters, Spectrum utilisation etc., which would form the basis of regulation? Please provide your response with justification.

Lynk does not believe charges exchanged between an SCN authorised entity and a service authorised entity should be regulated. This should apply equally to SCNaaS for FSS, MSS, D2D via MSS spectrum, and D2D via IMT spectrum. These are commercial wholesale arrangements between sophisticated parties. The charges will vary based on the service model, spectrum pathway, geography, capacity, satellite resources, gateway architecture, quality of service, term length, and customer offering. Regulating those charges would create unnecessary complexity and could delay deployment.

- For D2D via MSS spectrum, the SCN authorised entity and the service authorised entity should remain free to negotiate the commercial terms for wholesale satellite capability. The agreement may address use of MSS spectrum held by either party, satellite capacity, coverage, availability, latency, throughput, restoration time, service credits, reporting, security support, and interference response.
- For D2D via IMT spectrum, the MNO should remain free to negotiate the terms under which an SCN entity uses the MNO’s IMT spectrum with consent. That use should remain secondary, non-interference, non-protected, and limited to the relevant LSAs where the MNO holds the spectrum rights.

Regulatory oversight should focus on outcomes, not price control. The rules should ensure clear allocation of responsibility for spectrum use, interference management, lawful interception, emergency services, cybersecurity, consumer protection, data sovereignty, reporting, suspension, and termination. They should not prescribe wholesale rates, revenue shares, SLA prices, or spectrum-use charges. A market-led approach will preserve flexibility, promote competition, avoid unnecessary regulation, and support timely deployment of SCNaaS and D2D services in India.

23. In case of an agreement between an SCN Authorised entity and a Service Authorised entity providing D2D services using MSS spectrum, for provision of SCNaaS to the Service Authorised entity, which may or may not include provisions for utilisation of MSS spectrum assigned to the Service entity amongst other possible spectrum utilisation arrangements, is there a need to regulate charges exchanged between the two entities under such an agreement? If yes, what would be the possible parameters, including SLA parameters, Spectrum utilisation etc., which would form the basis of regulation? Please provide your response with justification.

No—see response to Q22.

24. In case of an agreement between an SCN Authorised entity and a Service Authorised entity providing D2D services using IMT spectrum, for provision of SCNaaS to the Service Authorised

entity, which may or may not include utilising spectrum for feeder link assigned to the service entity, besides utilising IMT spectrum assigned to the Service Authorised entity, is there a need to regulate charges exchanged between the two entities under such an agreement? If yes, what would be the possible parameters, including SLA parameters, Spectrum utilisation etc., which would form the basis of such regulation? Please provide your response with detailed justification.

No—see response to Q22.

25. Should the charges paid by the Service Authorised entity (providing either FSS, MSS or D2D service to the end user) to SCN Authorised entity for provisioning of Satellite Communication Network as a Service (SCNaaS), be permitted to be deducted from ApGR of the Service Authorised entity for the purpose of arriving at AGR for levy of License/ Authorisation Fees and Spectrum charges? Please provide your response with justification.

Charges paid by a service authorised entity to an SCN authorised entity for SCNaaS should be deductible from the service authorised entity's ApGR for purposes of calculating AGR, license fees, authorisation fees, and spectrum charges. This should apply to FSS, MSS, D2D via MSS spectrum, and D2D via IMT spectrum. Otherwise, the same revenue would be charged twice: once when collected from the end user by the service authorised entity, and again when received by the SCN authorised entity as wholesale SCNaaS revenue. This would raise costs, discourage use of shared satellite networks, and undermine the purpose of creating an SCNaaS framework.

The better approach is simple. The service authorised entity should pay fees on its net service revenue after deducting bona fide SCNaaS payments made to the SCN authorised entity. The SCN authorised entity should pay fees on the SCNaaS revenue it receives. This avoids double counting while preserving government revenue. It also treats SCNaaS like a wholesale input to the retail service. The deduction should be limited to actual, arm's-length payments for SCNaaS, including satellite capacity, feeder link support, user/service link support, baseband processing, resource management, gateway or interconnection support, network monitoring, and agreed SLA support. However, the deduction should not cover unrelated affiliate transfers or non-SCN services.

For SCN authorisation, GR should mean all revenue earned from activities under the SCN authorisation. This should include SCNaaS fees, wholesale satellite capacity charges, managed network charges, feeder link or user link support charges, gateway or interconnection support, baseband and resource-management fees, activation charges, and recurring service charges. ApGR should mean GR after excluding pass-through taxes, refundable deposits, bad debts actually written off, revenue from activities outside the SCN authorisation, capital receipts, debt, equity, asset-sale proceeds, interest, dividends, foreign-exchange gains, insurance recoveries, and other non-operational revenue not tied to SCNaaS. AGR should mean ApGR after allowing deductions for pass-through payments to other authorised entities, interconnection or access charges, and other permitted wholesale inputs that are already subject to fees in the hands of the receiving authorised entity. This structure is clear, avoids double taxation, and supports efficient SCNaaS deployment.

26. If the answer to the above question is no, please suggest the methodology for considering such charges in determination of AGR of both the service authorised and SCN authorised entities, for purposes of levying Authorisation/ License fees & Spectrum Charges? Please provide your response with justification.

See response to Q25.

27. What should be the appropriate definition of GR, AGR, and ApGR for SCN Authorisation, including the relevant items of revenue, exclusions and deductions? Additionally, are there any operational or non-operational revenue elements specific to SCN Authorised entities that should be considered within the scope of definitions of GR, AGR and ApGR? Please provide detailed response with specific line items of revenue, exemptions and deductions, and specific definitions for GR/ApGR/AGR.

See response to Q25.

28. In case FSS/MSS or any other spectrum is assigned to the Satellite Communication Network (SCN) authorised entities for provisioning of SCNaaS to Service authorised entities, what should be the broad financial terms & conditions of such an assignment?

Lynk recommends that the financial terms for any FSS, MSS, or other spectrum assigned to SCN authorised entities be clear, predictable, transparent, and proportionate. The framework should reflect that SCN authorised entities provide a wholesale satellite network layer that supports service authorised entities, including for FSS, MSS, D2D via MSS spectrum, and D2D via IMT spectrum. Spectrum charges should avoid excessive upfront fees, auction-style barriers, duplicative charges, or recurring fees that would discourage investment, delay deployment, or increase end-user costs. The terms should support long-term satellite investment, efficient spectrum use, and sustainable deployment in rural, remote, maritime, disaster-prone, and underserved areas. They should also remain consistent with applicable satellite spectrum frameworks and international practice where relevant. A simple and proportionate charging model will help enable SCNaaS, preserve competition, and support timely deployment of satellite-enabled connectivity in India.

29. Should the spectrum charges for Satellite Communication Network (SCN) authorised entities be based on the spectrum charging framework as per the Recommendations dated 09.05.2025 applicable for Satellite based commercial communications services? Accordingly, what should be the appropriate spectrum charging framework and spectrum charges applicable for a SCN Authorised entity? Please provide your response with detailed justification.

Yes—TRAI's 09.05.2025 recommendations may be used as a baseline for SCN spectrum charges, but they should be adapted to reflect the wholesale and enabling role of SCN authorised entities. The charging framework should be simple, predictable, transparent, and proportionate. It should not replicate retail-oriented charging models or impose excessive upfront fees, auction-style costs, duplicative charges, or recurring obligations that would delay deployment or raise end-user prices. For FSS and MSS spectrum assigned to an SCN entity, charges should reflect the nature of the spectrum use, the bandwidth assigned, the geography and period of use, and the wholesale SCNaaS function being provided. For D2D via IMT spectrum, no separate IMT spectrum charge should be imposed on the SCN entity because the MNO remains the spectrum-rights holder and the SCN entity uses that spectrum only with the MNO's consent on a secondary, non-interference, non-protected basis. A proportionate framework, recognizing that D2D services are low-cost and supplemental in nature, will support efficient spectrum use, long-term satellite investment, competition, and timely deployment of SCNaaS and D2D services in India.



30. If spectrum charges are to be levied on the basis of AGR of the SCN Authorised entity, are there any specific operational/ non-operational revenue items that should be excluded from AGR for the purpose of determination of spectrum charges? Please provide your response with detailed justification.

If spectrum charges are levied on the AGR of the SCN authorised entity, AGR should be limited to revenue earned from activities under the SCN authorisation and should exclude pass-through, non-operational, out-of-scope, and already-fee-assessed amounts. This is necessary to reflect the wholesale nature of SCNaas and avoid double counting between the SCN authorised entity and the service authorised entity. AGR should include bona fide SCNaas revenue, such as wholesale satellite capacity charges, feeder-link or user-link support, baseband processing, resource management, gateway or interconnection support, network monitoring, activation charges, recurring service charges, and agreed SLA support. Exclusions should include pass-through taxes, refundable deposits, bad debts actually written off, capital receipts, debt, equity, asset-sale proceeds, interest, dividends, foreign-exchange gains, insurance recoveries, and revenue from activities outside the SCN authorisation. Payments made by the SCN entity to other authorised entities for wholesale inputs that are already subject to fees should also be deductible to prevent double taxation. Spectrum charges should be AGR-based only and should not include fixed per-device charges, which would not fit the wholesale SCNaas model and could discourage large-scale deployment of FSS, MSS, D2D via MSS spectrum, and D2D via IMT spectrum.

31. If the spectrum charges are not to be levied on basis of AGR of the SCN Authorised entity, what should be the appropriate spectrum charging mechanism and the corresponding level of spectrum charges applicable to Satellite Communication Network (SCN) authorised entities? Please provide your response with detailed justification.

Given the nature of SCNaas and D2D as wholesale, supplemental, and resilience-oriented services, LYNK prefers a simple, predictable, and proportionate fixed-fee or capacity-based framework instead of AGR-based spectrum charges. This could include an administratively set flat fee or per-MHz charge. SCNaas is a wholesale network input, while the end-user service, pricing, and customer relationship are controlled by the service authorised entity or MNO. Spectrum charges should therefore be separated from retail revenue and should not vary by number of users, devices, messages, or customer plans. The charge should reflect actual spectrum use, bandwidth, geography, duration, and service type, while avoiding auctions, excessive upfront fees, duplicative charges, or fixed per-device charges. D2D via IMT spectrum should be excluded from any SCN spectrum charge because the MNO remains the IMT spectrum-rights holder and the SCN entity uses that spectrum only with the MNO's consent on a secondary, non-interference, non-protected basis. Keeping SCN spectrum charges low, transparent, and easy to administer will support investment, simplify market entry, accelerate D2D deployment, and help keep supplemental coverage and resilience services affordable for users in India.

32. In case D2D services are permitted to be provided using the MSS frequency bands such as L & S bands, what should be the appropriate spectrum charging framework for such bands when utilised for provision of D2D satellite based services? Please provide a detailed justification for your response, including the methodology for the determination of such spectrum charges, if required.

For D2D services using MSS spectrum, including L-band and S-band, LYNK recommends a simple, predictable, and proportionate spectrum charging framework that follows the preferred approach outlined in response to Question 31. Charges should be administratively set and limited to a modest

fixed-fee or capacity-based amount, such as a flat fee or per-MHz charge, designed to only recover reasonable regulatory overheads rather than reflect retail market value. MSS spectrum is a globally harmonized satellite resource, and it should not be subject to extra financial burdens solely because it is used for D2D services. The methodology should reflect actual spectrum use, bandwidth, geography, duration, and service type, while avoiding auctions, excessive upfront fees, duplicative charges, AGR-based retail charges, and fixed per-device charges. This approach will support early deployment, investment, affordability, and scalable D2D coverage in rural, remote, maritime, disaster-prone, and underserved areas of India.

33. In case D2D services are permitted to be provided using the IMT spectrum assigned to the Service Authorised entity ('partnering entity') providing D2D satellite-based telecommunication services, should any additional spectrum charges be levied on the Service Authorised entity ('partnering entity') for use of IMT spectrum in the provision of satellite based D2D services? If yes, what should be the basis and quantum of such additional spectrum charges payable by the Service Authorised entity to the Government? In either case, please provide detailed justification for your response, including the detailed methodology for determination of such spectrum charges.

No—additional spectrum charges should not be levied on either the partnering MNO or the SNO/SCN authorised entity for use of the MNO's assigned IMT spectrum to provide satellite-based D2D services. The IMT spectrum has already been assigned to the MNO under the applicable allocation process, with associated payment, rollout, and compliance obligations. D2D via IMT spectrum should be treated as an extension of the MNO's terrestrial network in hybrid satellite-terrestrial mode, not as a new spectrum assignment or separate chargeable use. The MNO remains the spectrum rights holder and controls the spectrum, while the SNO/SCN entity uses that spectrum only with the MNO's consent, in the relevant LSAs, on a secondary, non-interference, non-protected basis. Any additional charge on either party would be duplicative, increase service costs, delay deployment, and reduce the affordability and scalability of D2D coverage in rural, remote, maritime, disaster-prone, and underserved areas.

34. In case spectrum is assigned to Satellite Communication Network (SCN) authorised entities, what should be the appropriate payment terms for spectrum charges payable by Satellite Communication Network (SCN) authorised entities? Please provide your response with justification.

Payment terms for spectrum charges payable by SCN authorised entities should be simple, predictable, flexible, and aligned with the long-term investment profile of satellite networks. LYNK recommends intermittent payments under an administrative pricing framework, rather than large upfront payments or auction-style obligations. The charges should be modest and should recover reasonable regulatory overheads, with payment timing linked to appropriate assignment, deployment, or service availability milestones. The framework should also allow practical payment schedules set in consultation with licensees to avoid unnecessary late fees and administrative burden. This approach will support investment certainty, timely deployment, and the long-term viability of SCNaas, MSS, FSS, and D2D services in India.

35. In case Minimum Spectrum Charges are to be applicable for SCN authorised entities, what should be the payment terms for the minimum spectrum charges for SCN authorised entities? Please provide your response with detailed justification.

Lynk does not recommend applying minimum spectrum charges to SCN authorised entities at all. Minimum charges create an unnecessary entry barrier, especially before capacity is deployed or revenue is generated. They would add cost, discourage investment, and slow the rollout of SCNaaS, MSS, FSS, and D2D services. Spectrum charges, if any, should be based on the actual spectrum assigned and used, and should remain simple, predictable, and proportionate. Regardless, no minimum spectrum charge should apply to D2D via IMT spectrum because the MNO already holds the IMT spectrum and the SCN/SNO uses it only with the MNO's consent on a secondary, non-interference, non-protected basis.

36. What should be the minimum equity and minimum networth requirements for a Satellite Communication Network (SCN) authorised entity? Please provide detailed justification in support of your response.

Lynk does not recommend applying minimum equity and net worth requirements because they could stifle competition and innovation. Satellite systems are capital-intensive, deployment is often phased, and SCN business models may rely on owned, leased, or partner-provided satellite capacity and network resources. Any financial threshold should therefore focus on whether the applicant has the practical financial and technical capability to meet its proposed deployment and compliance obligations, not on rigid high minimums that could exclude new or emerging entrants. A balanced approach will preserve system integrity, support investment, encourage competition, and enable timely deployment of SCNaaS, MSS, FSS, and D2D services in India.

37. What should be the entry fee for proposed Satellite Communication Network (SCN) authorisation? Please provide detailed justification in support of your response.

The entry fee for SCN authorisation should be modest, reasonable, and limited to recovery of administrative costs. High upfront entry fees should be avoided because satellite networks are capital-intensive and often deployed in phases. Excessive fees would create unnecessary barriers to entry, reduce competition, delay deployment, and increase costs for SCNaaS, MSS, FSS, and D2D services. A low and predictable entry fee will encourage investment, support innovation, improve affordability, and help expand satellite-enabled connectivity in rural, remote, maritime, disaster-prone, and underserved areas of India.

38. What should be the rate of Authorisation Fee for a Satellite Communication Network (SCN) authorised entity? Please provide detailed justification in support of your response.

The Authorisation Fee for an SCN authorised entity should be low, predictable, transparent, and proportionate to the wholesale role of SCNaaS. SCN authorised entities provide network capability to service authorised entities. They do not necessarily control the end-user service, retail price, customer relationship, or subscriber revenue. The fee should therefore not mirror retail telecom authorisation fees or impose hidden costs that would burden deployment. High fees would ultimately affect end users by increasing the cost of FSS, MSS, D2D via MSS spectrum, and D2D via IMT spectrum services. This would be especially harmful for D2D services, which are intended to provide supplemental coverage, emergency connectivity, and resilience in rural, remote, maritime, disaster-prone, and

underserved areas. Furthermore, the framework should distinguish between D2D via MSS spectrum and D2D via IMT spectrum. For D2D via MSS spectrum, the SCN authorised entity may hold satellite spectrum rights and provide wholesale satellite capability to service authorised entities, so any fee should be modest and tied only to the SCN authorisation function. For D2D via IMT spectrum, the MNO remains the IMT spectrum-rights holder and controls the customer relationship, while the SNO/SCN entity uses the spectrum only with the MNO's consent on a secondary, non-interference, non-protected basis. Neither the MNO nor the SNO/SCN entity should face additional or duplicative fees for D2D via IMT spectrum. Hence, a modest and stable fee at most for D2D via MSS spectrum and no fee for D2D via IMT spectrum will avoid double counting, preserve affordability, support competition, and accelerate deployment of satellite-enabled connectivity across India.

39. Should a Minimum Authorisation Fee be applicable for the proposed SCN Authorisation? If yes, what should be the Minimum Authorisation Fee for the proposed SCN Authorisation? Please provide detailed justification in support of your response.

Lynk does not recommend applying a Minimum Authorisation Fee for the proposed SCN authorisation. A fixed minimum fee can create an unnecessary entry barrier, especially for new entrants, start-ups, and phased satellite deployments that may not generate material revenue at launch. It may also discourage investment, reduce competition, and slow deployment of SCNaaS, FSS, MSS, D2D via MSS spectrum, and D2D via IMT spectrum. If any minimum fee is adopted, it should be nominal, proportionate, and limited to recovery of administrative costs, but the better approach is to avoid a minimum fee altogether and rely on a modest, predictable Authorisation Fee that reflects the wholesale and enabling role of SCN authorisation.

40. What should be the appropriate payment terms & conditions for Authorisation Fees? Please provide detailed justification in support of your response.

The payment terms for Authorisation Fees should be simple, predictable, transparent, and aligned with the long-term nature of satellite deployment. Lynk recommends scheduled payments rather than large upfront payments or complex conditional structures. Payment obligations should be clearly defined in advance, with practical timelines that avoid unnecessary financial pressure during early rollout. Fees should remain modest and should not include hidden costs, duplicative charges, or penalties caused by unclear payment dates. A stable payment framework will support investment, ease administration, and enable timely deployment of SCNaaS, FSS, MSS, D2D via MSS spectrum, and D2D via IMT spectrum in India.

41. What should be the terms and conditions for Bank Guarantees, including both Performance Bank Guarantee (PBG) and Financial Bank Guarantee (FBG), for SCN authorised entities? Please provide detailed justification in support of your response.

Lynk does not recommend imposing Performance Bank Guarantees or Financial Bank Guarantees on SCN authorised entities. PBG and FBG requirements can create unnecessary entry barriers, especially for smaller providers, new entrants, start-ups, and phased satellite deployments. They also tie up capital that could otherwise be used for network deployment, integration, security compliance, and service expansion. SCN authorisation should rely on proportionate compliance obligations, reporting, and enforcement mechanisms rather than upfront financial guarantees. Avoiding PBG and FBG requirements will support investment, competition, and timely deployment of SCNaaS, FSS, MSS, D2D via MSS spectrum, and D2D via IMT spectrum in India.



42. What should be the application processing fee for Satellite Communication Network (SCN) authorised entity? Please provide detailed justification in support of your response.

Lynk recommends that the application processing fee for an SCN authorised entity be waived during the initial development period for India's satellite and D2D market, with a review after five (5) years. If a fee is imposed, it should be nominal and limited to recovery of direct administrative processing costs. The fee should not operate as an entry barrier or discourage participation by new entrants, smaller providers, or phased satellite deployments. A waived or nominal processing fee will support investment, competition, and timely deployment of SCNaas, FSS, MSS, D2D via MSS spectrum, and D2D via IMT spectrum in India.

43. Apart from the financial provisions discussed earlier, are there any other financial terms and conditions that should be made applicable for the proposed Satellite Communication Network authorisation? Kindly provide a detailed response with justifications.

Lynk does not recommend additional financial terms beyond a simple, predictable, and proportionate framework for SCN authorisation. Any financial conditions should support investment, scalability, and timely deployment, while recognizing the capital-intensive and phased nature of satellite networks. The framework should avoid heavily front-loaded payments, hidden costs, duplicative charges, minimum fees, bank guarantees, or other financial obligations that could discourage new entrants or delay service rollout. A stable administrative pricing approach, supported by fiscal incentives where appropriate, will help India's satellite sector continue to grow and will support affordable deployment of SCNaas, FSS, MSS, D2D via MSS spectrum, and D2D via IMT spectrum.