Consultation response form

Question	Your response
Question 1: What is the market opportunity for D2D services? What is the nature of the benefits that could be delivered to people and business in the UK and what do you estimate the magnitude of the benefits to be?	Confidential? – N In 2020, Lynk was the first company in the world to successfully demonstrate that non-geostationary orbit (NGSO) satellites in Low Earth Orbit can connect with unmodified, commercial-off-the-shelf cellular phones in the Falkland Islands. To date, Lynk has deployed eight satellites operating pursuant to experimental authorizations. In addition, Lynk is the first commercial operator to receive a United States Federal Communications Commission (FCC) licence to provide Supplemental Coverage from Space (SCS) services. Under this licence, Lynk can build and operate ten satellites to provide SCS services outside the United States, subject to the approval of local regulatory authorities. Lynk utilises terrestrial spectrum bands, using space-based cell towers connected to a Mobile Network Operator's (MNO) terrestrial network as a roaming partner to expand coverage for mobile phones that terrestrial networks cannot economically or technically reach. This would include unserved and underserved areas and remote rural areas. The Lynk system also provides instantaneous backup coverage and added resiliency for existing MNO infrastructure if there is disruption or damage to the primary terrestrial network. Lynk's mission is to provide connectivity to all 7.7 billion people everywhere on Earth *via* its patented 3GPP-compliant fronthaul satellite communications system. By partnering with Lynk *via* a simple roaming agreement, an MNO opens the door to new revenue in untapped markets, gives subscribers peace of mind with ubiquitous connectivity, and provides a potential pathway to economic prosperity for billions. Deloitte projects market opportunities to be more than 200 million smartphones that can connect with satellite services, which will be sold in 2024. Also, spending on satellite construction and launches could bring the total technology investment to help enable this market to more than US $ 3 billion in 2024. See Signals from Space: Direct-to-device satellite phone connectivity boosts coverage, (Nov. 29, 2023).

Question	Your response
	The benefits of D2D are that it will expand mobile services, particularly in unserved and underserved areas, including rural and remote communities, promote competition in the provision of wireless services so that consumers and businesses benefit from greater choice and competitive prices, support increased reliability and resiliency of telecommunications services, and foster investment and the evolution of wireless networks by enabling the development of innovative and emerging applications. The UK Government, businesses, and citizens will have another path to affordable, resilient communications with the Lynk D2D system. The Lynk system does not require a ground station to deliver Wireless Emergency Alerts. This means the Government has a path to deliver information even when ground infrastructure is compromised.
Question 2: Are there any wider citizen or societal benefits that D2D services could deliver that the market might not deliver? What is the nature of these benefits and why might the market fail to deliver them? For example, what role could D2D have in improving the availability of 999 services in the UK?	Confidential? – N Yes, there are broader societal benefits that D2D can provide, particularly in the realm of public safety. Lynk supports Ofcom's consideration of future implementation of 999 and Wireless Emergency Alert requirements for D2D providers. We encourage Ofcom to consider a holistic review of the technical constraints and other unique aspects of providing emergency alerting, 999 services, and public safety response services over satellite networks. Today, Lynk provides Cell Broadcast emergency alerts, also known as Wireless Emergency Alerts. The Lynk system creates a common communications platform that supports emergency response by connecting first responders, government agencies, international first responders and agencies, and affected communities across the globe. Specifically, when disasters occur that damage or disable the terrestrial wireless network, Lynk is still able to deliver critical information even with the loss of ground infrastructure. Lynk has conducted satellite-based data, voice, and text demonstration activities, including Cellular Broadcast, in dozens of countries worldwide and on all seven continents. Lynk's beta commercial service is fully operational in several countries, providing connectivity to previously unconnected people. Lynk and its global partners have demonstrated these and other capabilities that fully prove D2D technology in real-world applications. For instance, in July 2023, Lynk tested with the United States Government in Hawai'i. One of the Helemano Reserve test participants shared that this technology would address the need to communicate with civilians during a natural disaster just weeks before the devastating Maui fires. Given that one of the primary benefits of D2D is the ability to provide communications in currently unserved and underserved areas,

Question	Your response
	the ability to provide emergency communications will help alleviate and address concerns that many satellite networks have historically been unable to comply with 999 requirements due to technical infeasibility in the past. Lynk recommends that Ofcom adopt rules that enable MNOs to provision and utilise D2D to satisfy their resiliency obligations and emergency response and preparedness requirements where appropriate for the 999 service. Lynk believes it is critical that before any operator makes D2D available for emergency communications to first responders or the public, both the satellite and terrestrial operators proposing service undertake sufficient and demonstrable real-world testing of the capability. Such real-world testing should be conducted in coordination with public safety licensees to evaluate the risk of interference and procedures to detect, identify, and eliminate interference should it occur. Also, this issue is more significant than between carriers and D2D providers and should include public safety, the disability community, multilingual, and emergency communications professionals for the industry to get this essential service initially right by a take-your-time approach. Presently, Lynk is working towards the implementation of the U.S. interim requirement that 911 calls be routed to a Public Safety Answering Point (PSAP) using either location-based routing or an emergency call centre. The provider also must transmit location information and the user's phone number to facilitate dispatch and callback capabilities at the receiving PSAP. D2D holds the promise of delivering emergency communications for Governments, the public, and private citizens when terrestrial networks are not available, and the technology and industry are on a journey of building this capability. Lynk believes the UK Government would be served by early and often dialog with potential suppliers of D2D to understand the timelines and technology–both its advantages and limitations-to deliver 999 services. The services and requirements will grow over time and a policy framework to maximise the technology over this growth curve will save lives.
Question 3: Subject to suitable regulatory frameworks being in place, do you have an interest in offering D2D services or expanding an existing service, in the UK? Which customer segments, devices and use cases would be served? Would your D2D service complement or compete with services delivered over existing mobile?	Confidential? – N Yes, Lynk is keen on offering D2D services and has tested such services in the United Kingdom (UK). Extensive testing in the UK has been fundamental to not only Lynk's development but the very creation of the D2D category. Lynk's services would complement current MNO services in the UK. Lynk's patented, proven, and commercially licensed satellite-direct-to-standard-mobile-phone system allows commercial subscribers to send and receive text messages to and from space via standard, unmodified mobile devices. Lynk's initial service is text messaging; the system supports a

Question	Your response
	full range of telecommunications capabilities and products, including text messages, wireless emergency alerts, voice, and data. Currently, Lynk's D2D service is compatible with more than 99% of the cellular devices manufactured in the world over the past 30 years. Notably, Lynk's testing yields connection attempts from smartphones, feature phones, IoT devices, cars, and tractors. Lynk's D2D service is complementary to existing mobile services. Lynk partners with Mobile Network Operators to provide gap coverage, extend their coverage, or provide their network with resiliency. It enhances our partner's bottom line by allowing them to make the most of their spectrum investment while increasing the services to their customers.
If you have considered launching or expanding a D2D service in the UK: **Question 4:** What technology and network architecture do you consider appropriate to use to deliver D2D services? For example, what altitude and how many HAPS, LAPS or satellites would be required to deliver an initial service? **We're aware that different technologies and network architectures will have different costs, performance, and spectrum efficiency trade-offs**.	Confidential? – Y {✂}
Question 5: What capacity (e.g., Mbps/Km_2/MHz) and quality of service (e.g., latency) could be delivered with the D2D service you are proposing? What percentage of the UK landmass could be covered, and would coverage be provided indoors?	Confidential? – Y {✂}
Question 6: To inform our future policy development, which spectrum band would you like to deploy the service in? How much bandwidth would be required to provide the service at launch?	Confidential? – N Lynk provides global 2G, 4G, and 5G services using the 698-960 MHz bands, encompassing a considerable portion of the current spectrum bands. To provide D2D services, Lynk provides service over an MNO's current terrestrial spectrum. Lynk also provides the

Question	Your response
	flexibility to include additional spectrum based on MNO partner requirements for D2D service.
Question 7: What take-up profile do you assume in your planning? For example, the number of active devices, monthly calls made, and data transferred per device. What is the roadmap for enhancing your network to meet anticipated future growth? What additional infrastructure and/or spectrum would be required? When?	Confidential? – Y {✂}
Question 8: What are the use cases and the benefits these services would deliver? What technology, network infrastructure and frequencies would be required to deliver the service? What are the advantages of using this MSS spectrum compared to other bands?	Confidential? – N See infra, questions 1 and 2 regarding use cases and benefits. The Lynk network requires no changes to the MNO network as it integrates seamlessly *via* existing roaming interfaces. It also will not require any mobile device modification to receive the mobile D2D service. Lynk supports frequencies from 698 to 960 MHz. Whether this spectrum falls in the MSS spectrum is dependent on a given country's Table of Allocations. This spectrum propagates very well compared to higher frequencies. It also has the advantage of being in standard unmodified phones today. It is backwards compatible with the device people already own and can afford.
Question 9: What current, or future, technology developments will offer the opportunity for more efficient use of MSS spectrum? E.g., more spectrally efficient, or greater ability to share spectrum.	Confidential? – Y {✂}
Question 10: Could your existing, or proposed, service coexist with other users of the same frequencies within the MSS spectrum bands? If so, how is coexistence achieved? If not, please explain why sharing is not possible.	Confidential? – Y {✂}

Question	Your response
Question 11; Do you expect D2D services to be available prior to WRC-27? What services and benefits do you think an authorisation prior to WRC-27 might bring to UK consumers and businesses?	Confidential? – N Yes, D2D service is available today before WRC-27, as Lynk is currently in commercial beta service in 8 countries with 9 MNO partners. By WRC-27, we expect that D2D voice, data, and Internet will be a part of Lynk's worldwide service offering to its MNO partners. Regulators around the world are creating paths to commercially deploy D2D. Some regulators allow MNOs to simply notify them of their use of the Lynk system to governments expanding their Table of Allocations. The FCC Report & Order now allows SMS deployment in the United States. Other regulators are still formulating their market access and licensing procedures. Lynk believes these efforts will significantly inform WRC-27.
Question 12: Are there any mobile bands that should be prioritised for satellite based D2D?	Confidential? – Y {✂}
Question 13: Are there existing systems that you consider could be subject to an increased risk of harmful interference from the introduction of satellite based D2D using mobile bands? If yes, are there specific mobile bands that you consider should be avoided to reduce this risk?	Confidential? – Y {✂}
Question 14: Do you have any views on how spectrum for D2D services should be authorised? Does this vary by band, or type of NTN? Please explain the reasoning behind your preference.	Confidential? – N Ofcom should develop a D2D spectrum framework that allows a terrestrial mobile carrier to utilise the best D2D provider that meets both their geographic service areas and spectrum holdings. Ofcom should be open to an MNO utilising more than one D2D provider. D2D is truly about resiliency. By allowing an MNO the flexibility to contract with partners, the Regulator is maximising the benefits of D2D. As an industry, D2D providers, together with their MNO partners, will need to work together to deconflict spectrum deployments. D2D does not require new devices, allowing D2D satellite providers to use their MNO partners' terrestrial spectrum for the services they provide.
Question 15: Are there any other points that you think would be useful in our	Confidential? – N Lynk's view, based on its considerable experience in the international D2D marketplace, is that a flexible approach combined with experimental demonstrations of a system's architecture and business arrangements between D2D providers and MNOs provides a

Question	Your response
considerations? In providing your response, please provide as much evidence as possible.	path to expedient deployment. This approach enables all MNOs – including large spectrum licensees, regional and rural carriers, and carriers with fragmented spectrum holdings – to pursue D2D as soon as possible. As other nations have proposed, implementing nationwide geographic licensing is well-intentioned in solving the most straightforward case, but it is potentially anti-competitive and may negatively impact rural carriers. Based on Lynk's global experience, multiple alternative paths toward service can adequately protect adjacent channel and area licence holders through business arrangements. Requiring, however, satellite operators to have entered into a commercial relationship with an MNO prior to applying for Ofcom D2D authorization stifles competition, adds unnecessary regulatory delay in the deployment of satellite networks, and does not meaningfully add any protection for the MNO provisioning SCS in their licensed markets. The D2D market would be best served by permitting satellite operators to obtain D2D authorizations at the time they are ready to seek regulatory approval, regardless of whether the satellite operator has partnered with an MNO. Regulatory authorization is often the long pole in bringing a service to market, and for newer companies, it is often a required demonstration to secure partner buy-in. By adopting a rule that limits applicants to only those who have previously entered into a commercial relationship with an MNO, Ofcom will create an unjustifiably high barrier to entry for newer or smaller satellite operators and unfairly advantage larger satellite operators who are well-known to potential MNO partners. The compounded risk of high barriers to entry and delayed deployment will dramatically reduce the number of small and new satellite operators who can afford to participate in the D2D marketplace. Having fewer competitors will ultimately harm consumers and the D2D marketplace. Since the relationships between the satellite operators and MNOs are contractual and non-exclusive, each party will likely have multiple partners that will change over the licence term, depending on the terms of the contract. Ofcom should enable satellite operators to seek approval to operate in the D2D frequencies regardless of whether they have an MNO partner but condition the start (and continuation) of services on securing an MNO for the relevant markets.

Please complete this form in full and return to mobilefromskyandspace@ofcom.org.uk