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In response to Consultation regarding the Draft five-year spectrum outlook 2022–2026, OneWeb would like to thank MBIE for the opportunity to provide the following comments to MBIE

### **General Background on OneWeb**

OneWeb is a global telecommunications provider, with main European Union office in Luxembourg. The OneWeb system will provide low latency, high capacity, connectivity solutions to customers through a new generation of low-earth orbit (LEO) satellites. OneWeb believes that satellite systems have a key role to play in a multi-network broadband ecosystem, often in a complementary way to terrestrial telecommunication solutions.

OneWeb is being deployed worldwide and the OneWeb commercial services in northern regions and will achieve global coverage by the end of 2022. OneWeb sells satellite capacity on a wholesale, business-to-business model, and our distribution partners are the telecom service providers and mobile network operators in each country, along with large enterprises and government institutions itself, all of whom then provide broadband internet connections directly to unconnected, underserved end-users and citizens.

### **The importance of radio spectrum for satcom**

The COVID-19 pandemic has highlighted the critical nature of the digital infrastructure to the economy and communities of every nation including those in rural and remote areas. Lockdowns and quarantine measures across the world in the wake of COVID-19 are creating an increasing gulf: it has accelerated adoption of home working, digital health care, fintech and remote education for the connected

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population. However, the same jobs, education, and public services are not accessible to the unconnected. As a result, the wealth prospect difference is growing larger the longer the pandemic lasts.

Partnerships between satellite and terrestrial operators are key to improve the access and affordability. Only by using LEO satellite constellations will universal service be truly achieved across New Zealand. Particularly, OneWeb will be working hand in hand with our telecom partners who will use our cost effective, fiber-like connectivity solution to further their networks' reach. National mobile operators' customers will likely pay cost-effective fees similar to those of their counterparts in the cities. Successful partnerships such as these can enable remote communities to finally enjoy the benefits of truly inclusive connected societies, unlock digital opportunities, and spur economic growth.

4G and 5G matching QoS on OneWeb's LEO constellation allows it not only to provide coverage solution where terrestrial build out is never going to be feasible economically, but also to the "temporarily" unconnected areas, as satellites provide an important interim infrastructure in areas even where terrestrial may eventually arrive. By encouraging telecom terrestrial operators to use satellites for interim infrastructure satisfying promptly the user demands, Nations can not only meet their universal service goals, but also begin to enjoy the advantages of a connected population and economies far sooner than expected.

Furthermore, satellite-based solutions offer highly robust technologic and operational solutions when facing natural disasters, and Fixed and Mobile satellite user terminals are the fastest way to establish or re-establish communication for emergency services to assist them during relief effort. In addition, combining OneWeb User Terminals to an existing or a vehicle mounted cellular base station can re-establish the entire public mobile network in a matter of hours to reconnect the whole community.

Spectrum policy has a critical role to play on adoption of emerging technology such as the LEO satellites, and access to interference-free spectrum is critical to operation of the OneWeb solutions.

### **Spectrum of interest to OneWeb**

Fixed Satellite Services (FSS) such as those offered by OneWeb are currently using the Ku and Ka-band to provide broadband communications services. OneWeb uses the 27.5-30.0 GHz uplink band paired with 17.8-19.3 GHz downlink is used for the gateway earth station-to-satellite link, and the 10.7-12.7 GHz paired with 14-14.5 GHz for the service link in our current satellite design.

In addition, and given the current congestion in the Ka band with over 130 GSO satellites and several NGSO constellations, OneWeb is also intending to use extensively the FSS allocation in Q/V band (which ranges between 37.5 to 51.4 GHz) for feeder links for our next generation of gateways. As such, OneWeb has already submitted satellite filings at the ITU and has also requested a license in the USA, i.e., submitted a request in an FCC processing round regarding this frequency band.

Looking higher in the bands, the satellite industry is increasingly looking at E-band, 70/80 GHz as the new frontier for future development of satellite communication. 71-76GHz and 81-86GHz band is allocated to Fixed-Satellite Services (FSS) on a co-primary basis, across all 3 ITU Regions. This potential for global harmonisation of these frequency bands makes them particularly attractive for satellite ecosystem development. ITU WRC-27 will take a step further to study this band for non-geostationary fixed-satellite system feeder links.

### **ITU satellite coordination framework**

RSM's noted in the consultation that *"it could be necessary to adapt international regulation of satellites to capture these new use cases and to address technical, commercial and regulatory considerations. This will also ensure that international regulation doesn't constrain the development of new use cases."* OneWeb would like to respectfully submit that such *adaptation* needs to be done with extreme caution, and some of the basic and core principle should underpin and apply to any new domestic approach.

Coordination between satellite systems is handled directly among operators under the well-established ITU Coordination Procedures. The ITU framework is based on the principle that the right to use orbital and spectrum resources for a satellite network or system is acquired through negotiations concerned by actual usage of the same portion of the spectrum and orbital resources. It requires later-filed systems to be the ones to mitigate harmful interference should it occur, which encourages innovation, creativity, and the very "flexibility" to co-exist.

However, this does not mean that newcomers will not be able to access the same spectrum and orbital resources, but that they will need to take into account previous systems in their design and operational configurations. OneWeb believes that this is achievable through good faith coordination and the adoption of mitigation techniques.

Under ITU Coordination Procedures, the system with the later date of protection needs to complete coordination to the maximum extent possible with prior filed systems before being brought into use and obtaining international recognition. This obligation is critical for two reasons:

- it encourages the later filed system to design their system with the flexibility necessary to avoid harmful interference from/to the previous filing system; and
- it encourages the later filed system to adopt any mitigation techniques at the design stage that, in the absence of this obligation, they would not otherwise be willing to adopt.

Until such a Coordination Agreement is signed between two NGSO systems, the ITU Radio Regulations require the later-filed system to eliminate any harmful interference into the earlier-filed system.

Following ITU framework, 99.95% of spectrum assigned to satellite networks was free from reported harmful interference<sup>1</sup> and has proven to be the best means of achieving rational, cost-effective, and efficient spectrum and orbital management.

Finally, OneWeb fully support *New Zealand will need to play its part in ITU forums to improve the coordination regime*. RSM should put its knowledge and experience to help building on and complement the existing ITU Coordination Procedures within ITU study groups such as WP4A.

OneWeb respectfully submit this information and urge the MBIE to consider these socio-economic benefits LEO broadband satellites can bring and safeguard necessary spectrum for satellite service in New Zealand, while continuing to promote the ITU Radio Regulation and ITU coordination procedures.

Please do not hesitate to contact us if you would like to discuss the content further.

Yours truly,



**Peng Zhao**

Director, Government Affairs and Policy

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<sup>1</sup> <https://www.itu.int/bestofwrs20/wp-content/uploads/sites/4/2021/05/WRS-20-Orbit-Spectrum-International-Regulatory-Framework.pdf>