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2021 Regional Telecommunications Review Secretariat
Department of Infrastructure, Transport, Regional Development and Communications
GPO Box 594
CANBERRA ACT 2601

OneWeb welcomes the Committee's review into the telecommunications services in regional, rural, and remote parts of Australia, and would like submits the following comments.

We remain at disposal of the Committee members for any clarifications on OneWeb network and services shall you find it useful.

Sincerely,



Peng Zhao,
Director, Government Affairs and Policy
OneWeb

About OneWeb

OneWeb is the world's second biggest satellite operator, with plans to build three major gateways in Australia. As a global communications company powered from Low Earth Orbit (LEO), OneWeb is building an advanced satellite constellation to connect businesses, telecom, and governments with high speed, low-latency, internet connectivity. OneWeb brings secure, resilient connectivity, through a network of distribution partners, from pole to pole, across oceans and continents. OneWeb is committed to the responsible use of Space and sustainable practices on Earth, to bridge the digital divide and to serve communities currently denied schooling, health, and online government services.

1. What telecommunications services are required in regional Australia to meet current and future needs? Are there any things regional communities and businesses need to do, but can't, on their existing services?

Broadband internet is today one of the primary engines of economic growth, diffusing across all sectors of the economy, making it one of the most critical telecommunications services for regional Australia. A robust digital infrastructure backbone is the critical component to allow industries and communities to flourish. Multiple studies have established the spill over benefits from internet and broadband on the economic growth of a country. Around 0.8 percent of Australia's population are not covered by 4G network, and those citizens are not benefiting from the digitalisation of all the services including for remote education, home working and digital health care accelerated by the current Pandemic. As a result, the digital gap and the wealth prospect difference is growing larger.

2. What changes in demand, barriers or challenges need to be addressed when it comes to telecommunications services in regional, rural and remote Australia?

The challenge to provide connectivity in remote areas is an economic rather than a technological one. Practically, the same last mile technology solution (LTE, 5G or Wi-fi) available to urban areas are also available to rural and remote areas, however, a base station in a those area does not generate as much revenue as in the city; yet, the cost of establishing a rural site, and laying down the necessary infrastructure to connect it to the core network is much higher in remote areas, and most of the cost premium comes from backhaul, as demonstrated in a recent GSMA report¹. Fibre backhauls can cost around five to ten thousand USD per kilometre and is just not viable over long distance for small pocket of population. Microwave links can sometimes be an alternative, but uneven topography and the presence of geographical impediments mean they are not always possible.

In contrast, Low Earth Orbit (LEO) Satellite network services such as the one offered by OneWeb can be accessed wherever there is direct line of sight to the sky above, and unlike terrestrial backhaul solutions, *distance to the gateway is irrelevant to the roll out cost*. Our satellite backhaul solution integrates seamlessly with any last mile technology (such as 5G or wi-fi) to create a connection with low latency (almost no delay), high throughput, and secure internet access for the currently unconnected community.

3. How have the Government's policies and programs affected telecommunications service outcomes in regional, rural and remote Australia? How can these be improved?

While it is acknowledged that the Government's NBN satellite initiative has played a vital role in bridging the digital divide for people in rural and remote areas, the

¹ <https://data.gsmaintelligence.com/research/research/research-2021/radar-connectivity-from-the-sky>

OneWeb non-GSO large constellation satellite system currently being deployed will be able to play an important role in augmenting existing satellite broadband infrastructure thereby ensuring that users gain the benefit of access to improved throughput, lower latency connectivity at competitive price points.

Furthermore, spectrum policy has a huge impact on satellite operation. Access to interference free spectrum in bands such as Ku- and Ka- band is key to operation of the OneWeb solutions, and affordability of these spectrum directly impact the business case of bringing service into those rural and remote area. In this regard, OneWeb would like to commend recent spectrum fee review performed by ACMA to reduce the cost of doing business and making the Australia market more attractive as a whole. Following the same path, Government should further consider waving such fees completely in region/area where connectivity is critical, but the business case is still not strong enough.

4. How do service reliability issues impact on regional communities and businesses? How do outages, including in natural disasters, impact on communities and businesses?

Telecommunication service reliability and resilience is fundamental to regional communities and business. Critical factors for human settlements at a particular location include assessments of how disaster-prone is that region? How often do key infrastructure outages occur? And most importantly, how quickly can an outage be remediated?

Satellite based solutions are more robust than terrestrial technologies 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 (not to mention reconnecting the whole community). In addition, combining VSATs with an existing or a vehicle mounted base station, a LEO constellation can re-establish the entire public mobile network in a matter of hours.

5. How might such impacts be addressed to ensure greater reliability? How can the network resilience be addressed in regional areas?

Thanks to the advantages of satellite solutions mentioned above, mobile operators often decide to contract for a satellite solution as a back-up (even when a base station is already connected via terrestrial backhauling), to provide redundancy and switch it on when the primary solution fails in disaster prone areas.

Therefore, in cases where those base stations are LTE or 5G, a OneWeb satellite backhaul solution can complement existing fibre or microwave backhaul.

6. How did the use of digital services change for regional consumers and businesses during the response to the COVID-19 pandemic? What insights for future service delivery does this provide?

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 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.

7. What can be done to improve the access and affordability of telecommunications services in regional, rural and remote Indigenous communities?

Referring to our response in question 2, 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 Australia (including its islands).

Particularly, OneWeb will be working hand in hand with our telecom partners who will use our cost effective, fibre-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.

8. How can investment in telecommunications infrastructure work with other programs and policies to encourage economic development in regional Australia?

Globally, much emphasis has been given to the development of last mile technology to solve the digital divide. However, Middle-Mile connectivity is the most prominent challenge of rural/remote connectivity. Even if the Last Mile solution is successfully implemented, the data traffic still needs to be connected to the public Internet via backhaul, typically via fibre in urban areas. But as explained in our response to question 2 above, other solutions such as LEO satellite backhaul will make much more sense economically over large distances.

Therefore, when tackling connectivity issue in rural/remote areas, there is no one size fits all. And taking a technology neutral approach to Middle Mile as well as Last Mile will lead to the most economical and therefore most affordable solution to consumers, supporting the aspiration to have ubiquitous broadband connectivity.

That said, even if the OneWeb solution can improve the economics considerably for the backhauling part of the remote site deployment, there will always be a point where the total cost of providing coverage would be above the potential revenue. Policy makers should ensure additional grants or other incentives are available to operators in such areas to make sure the business model can be sustainable.

9. What role could innovation, including new models, alternative investors or new ways of doing business, play to encourage investment in regional telecommunications infrastructure? What are the barriers?

Innovative low Earth Orbit satellite constellations will offer fibre-like connectivity everywhere. These LEOs are not like the traditional satellites of the 20th century.

OneWeb's LEO constellation is 30 times closer to earth than a traditional GEO satellite, and because of the lower altitude, LEO satellites have much lower latency (typically below 50 ms) which is critically important for today's broadband communications. While GEO would be a good solution for broadcasting, or latency insensitive communications, LEO would be a better match for high throughput, low latency two-way communications, and as such, is a perfect complement to LTE and 5G network backhauling.

Like any wireless service, OneWeb satellites would need access to affordable spectrum and protection from interference. Current ACMA spectrum fees are taxed depending on urban density, and are lower in rural regions than urban regions, but in areas where connectivity is required the most, such taxes could be waved altogether.

10. To what extent will new technologies enable significant change to the delivery of telecommunications services in regional Australia over the next 5-10 years? Are there any barriers to accessing these technologies?

The new LEO satellite technology will revolutionize the delivery of telecommunications services all over the world within 5 years. OneWeb is building a global communications network powered from space to deliver low latency, high-speed broadband Fixed Satellite Service (FSS) through a non-geostationary orbit (NGSO) satellite network. The initial phase the constellation will include roughly 600 LEO satellites in circular polar orbits at 1200 km. OneWeb produces one to two satellites per day at its factory and is currently launching at cadence of 36 satellites per month. As of September 2021, OneWeb has successfully launched 322 satellites into orbit.

OneWeb's commercial services will start by end of 2021 in areas above 50 degrees North, and full global coverage will be by end of 2022. OneWeb is well advanced in implementing its plans to provide satellite broadband access to Australian customers and it is about to finish the construction of three Ka-band (28 GHz) gateway earth stations in Australia.

11. How can Government better support the rapid rollout of and investment in new telecommunications solutions in regional areas?

As a company with global reach, OneWeb would deploy its capacity strategically. It will choose the market area with the best business case and most regulatory certainty to deploy first.

Government can reduce regulatory barriers, and ensure it is cost efficient for satellite operators such as OneWeb to provide services by reducing or waving taxes and spectrum fees especially in areas where providing the connectivity is critical.

In areas with extremely sparse demand, Government should consider providing additional funding and investment incentives so that OneWeb and its partners can have a more sustainable business case.

12. How can different levels of Government, the telecommunications industry and regional communities better co-ordinate their efforts to improve telecommunications in regional Australia?

In sparsely populated areas, government can channel and aggregate demands from communities to create a critical demand mass to help the industry to prioritise the roll out.

13. What changes to Government investment programs are required to ensure they continue to be effective in delivering improved telecommunications?

Government could consider sharing/splitting the subsidy given to last mile technologies with the new LEO middle mile technologies

15. To what extent is public information on connectivity options, including predictive coverage data and speeds, sufficient to help regional customers make informed decisions? What other information is needed?

Traditionally, a key consideration for extending a terrestrial (mobile) network is to look at the distance to the closest fibre ring, however with a LEO satellite backhauling solution, this distance is irrelevant. Service providers would be looking at the pocket of unconnected population most in demand of internet access. Therefore, it is useful to understand the location of uncovered population and businesses to quantify the demand and build the business case.
