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To: [DigitalConnectivity](#)
Subject: Submission by [REDACTED]
Date: Thursday 31 March 2022 14:17:21
Attachments: [Submission_DCS - \[REDACTED\].pdf](#)

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A consultation on the State's Digital Connectivity Strategy - [REDACTED]

I attach my submission.

[REDACTED]

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[REDACTED]

Public Consultation
Department of the Environment, Climate &
Communications
29-31 Adelaide Road
Dublin 2
D02 X285

Wednesday 30th March 2022

A consultation on the State's Digital Connectivity Strategy -

Dear

This submission seeks inclusion of new technologies relating to broadband delivered by low-Earth orbit (LEO) satellites in Actions and Enablers sections of the final version of the Digital Connectivity Strategy.

I have noted that the draft Strategy has made no reference to these technologies notwithstanding that LEO broadband services are currently being offered in Ireland and are becoming important components of broadband delivery worldwide, both standalone and in conjunction with other technologies including geostationary satellite, 5G/6G and fibre.

I am making this submission as a private citizen who has been concerned about aspects of the National Broadband Plan since 2019 as expressed in a [letter](#) published in the Irish Times in May 2019.

1. Background

In mid-2019 I initiated a campaign to create awareness of the potential of LEO broadband especially amongst ministers and politicians. This included making a detailed submission to the Oireachtas Committee on Communications which had been asked by the then Taoiseach to review the NBP. The primary recommendation in my submission was as follows:

Our central recommendation is that the Government should commission independent experts in space communication technologies and space economics to update the already cited OECD's report on [The Evolving Role of Satellite Networks in Rural and Remote Broadband Access](#) from an Irish perspective and to critically examine short-medium term plans by satellite broadband service providers (deploying low-Earth orbit and high-throughput satellites) and to assess of their likely impact on Ireland.

This was ignored and my reaction was described in a further [letter](#) published in the Irish Times in August 2019. The proposed study would have confirmed the emerging role of LEO broadband for rural areas and might have cost about €100,000, delaying the NBP by a few months. It is noteworthy that Analysys Mason, the Department's and NBP's key technology adviser, published in September 2020 a discussion [paper](#) about the potential of LEO satellites to significantly change broadband services in poorly served areas.

In February 2021 I updated my Oireachtas submission, [Plan B for NBP](#), and conveyed copies to Oireachtas Committees, Ministers and TDs/Senators. Its recommendation was as follows:

The Government should immediately review the NBP, notwithstanding contractual and strategic commitments, and actively encourage and support the provision of high-speed broadband via low-Earth orbit satellites to premises within the Intervention Area especially where the NBP's incremental capital expenditures and waiting times for service are likely to be significant.

Note how the two recommendations have evolved from a research focus to an action orientation in the space of under two years. It is still not too late to address the issues raised in my recommendations.

2. LEO Broadband Services

Having been spurred on by development of low-cost satellites, re-usable launch vehicles and advances in space-comm technologies, LEO broadband services are emerging alongside other LEO services for weather, agriculture, transport, communications etc. These are expected to be the main drivers of future growth within the space industry and will involve investments of the tens of billions.

SpaceX's Starlink service is the only commercial LEO service currently in operation and has a multi-year lead over competitors. Without seeking to provide a comprehensive review of Starlink's recent progress, I would like to draw attention to the following:

- To date over two thousand Starlink LEO satellites have been launched. A further two thousand, to be launched by end 2023, are needed to provide a global service with an additional thirty thousand planned for infill and enhancing performance in terms of speeds, latency etc. This growth will be facilitated using SpaceX's Starship rocket which will be able to orbit about four hundred satellites per launch, as compared with about fifty when using existing Falcon 9 rockets.
- Starlink's technology has already moved to a second generation with all newly launched satellites incorporating inter-satellite laser links which over long distances will be faster than terrestrial fibre connections.
- The service is available throughout Ireland and in about thirty other countries. About 250,000 customers have been secured worldwide to date alongside a lengthy waiting list for service.
- The service is 'direct-to-customer' with up front charges of US\$599 for its specialised antenna and a monthly service charge of US\$110. For many users, the service is self-install as the only preparation required is to place a small antenna on a roof or pole to secure a clear all-round view of the sky. The motorised phased array antenna takes care of setup and orientation automatically.

Having been licensed in Ireland by ComReg, the Starlink service commenced in Ireland last July and by word-of-mouth is building up a user base amongst households and small businesses mainly in rural areas which are frustrated by delays in securing NBP's or commercial services. Two Starlink ground stations, incorporating thirteen 3-metre antennas, have been established near Middleton and near Kinsale. I believe that the latter station connects with GTT's trunk

cable linking Ireland with the UK and North America. Currently, signals go from a household's antenna up to passing satellites, then down to a ground station in Cork and from there by trunk fibre to a POP in London.

Starlink has been widely welcomed and praised by its customer base which represents users in rural or remote areas which are unserved or poorly served by existing broadband services which for technical or commercial reasons cannot or will not offer service. Its performance has frequently exceeded 'highest' expectations, and it is often described by 'broadband poor' users as a "game-changing".

Based on my experience and almost a thousand measurements with a Starlink antenna mounted at chimney level on my home in Dublin, download speeds have averaged 225 Mbps, uploads 25 Mbps, latency about 45 ms and uptime 99.85%. User comments on social media confirm that these performances are being consistently achieved, or bettered, across Ireland. They are well in excess of what is needed by most households for the foreseeable future for communications, commerce, education, health and socialising.

While the Starlink service may appear expensive to users, it is very much less so from a national perspective. Starlink's front-end charge of should be compared with the NBP's capex¹ needed to pass customers in more remote rural areas with fibre, adjusted to take account of actual uptake.

While Starlink is currently the only operator of LEO broadband, other players will emerge within the next few years. These include Amazon, Telesat, OneWeb and Rivada as well as EU, Chinese, Korean and Indian national operators. The potential of using LEO satellites to help provide services to conventional mobile phones, for 5G backhaul and blending LEO services with geostationary services are being pursued and will lead to greatly enhanced offerings and performances from a consumer's perspective.

3. Proposals

Against this background LEO broadband will be a significant component within most countries' national digital strategies.

I respectfully ask for the following items to be included in the Digital Connectivity Strategy for Ireland:

¹ According to the [NI Audit Office](#), the cost of delivering fibre to the North's rural premises will be about £165 million. This will cover 79,000 premises at a cost per premises of £2,100. However, it estimated that the cost of including 2,500 most remote premises (3% of the total) could be an additional £24 million, equivalent to £9,600 per premises and 4.6 times the overall average.

On the same basis, our Exchequer's contribution of €2.6 billion to bring fibre to 554,000 premises points to an average cost per premises of about €4,700. If the ratios applicable to the most remote premises in the North were to also apply in the South, then the cost of servicing the 17,000 most remote premises (3% of the IA) could total €320 million based on an average cost per premises passed of €19,000 (4,700*4.6). If, the medium term, only about 60% of passed premises take a NBP broadband service, the average cost rises to €32,000 per customer. Even if these guesstimates are 100% wrong, they are still many orders of magnitude greater than the cost of a Starlink antenna.

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1. Recognition that satellite broadband (specifically LEO but also MEO and VHT²) will be a **key strategic enabler** to help progress the State's Digital Connectivity Strategy alongside other more established technologies such as fibre and 5G being deployed through the NBP and by commercial operators.
 2. An **action**, listed alongside those described on page 4-6 of the Strategic Summary, to cover the provision of high-speed broadband via LEO satellite services. This action should be especially aimed at premises in remote rural areas which will be waiting years for the NBP. It could be viewed as either a permanent or temporary measure depending on availability of alternatives, relative performances and consumer preferences later in the decade.

In support of this, a voucher scheme should be introduced to cover the initial cost of antennas (€600) for users. Based on an uptake by, say, twenty thousand premises the once-off cost to the Exchequer would be about €12 million. The scheme could be operated along the lines of similar Welsh or Scottish programmes or as a variant of the Revenue's Remote Working Relief.

While this action is meritorious in its own right, it would also complement, accelerate and enhance many of the other actions listed in the Strategic Summary.

Please do not hesitate to contact me if I can be of further assistance. Other than my contact details, I have no objection to publication of this submission.

Yours sincerely

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PS. I wish to declare that while I have had free access to a test Starlink kit since May 2021 for evaluation purposes this has conferred no financial benefit as I continue to also use a paid-for Irish broadband service. Other than that, I have no commercial relationship with SpaceX/Starlink or any other similar organisations.

² MEO = Medium Earth Orbit (from 2.000 kms up to 35.000 kms).
VHT = Very High Throughput. These are next generation satellites with terabit capacities.