Dear Sir/Madam,

Please find attached a response to the Consultation on the Digital Connectivity Strategy from Ericsson.

I trust you will find it informative and please feel free to reach out for any clarifications.

Regards

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Head of Ericsson Ireland

ericsson.com

Ericsson Response to the Consultation on the Digital Connectivity Strategy

For the Department of the Environment, Climate, and Communications (DECC)

Ericsson welcomes the opportunity to respond to the consultation on the 'Digital Connectivity Strategy, 2022', prepared by the Department of The Environment, Climate, and Communications from the Government of Ireland (DECC).

Summary

We live in a rapidly changing world on the cusp of a new era of possibilities. That naturally brings uncertainty, but also a wealth of exciting opportunities. Over the next decade, several forces will shape our world and how we live and work, from the climate crisis through to technological advancements such as AI. The Digital connectivity strategy needs to consider the impact of these forces and ensure that Ireland's digital infrastructure has the potential to improve lives, redefine businesses and pioneer a sustainable future. Having a robust ambition and pathway to deliver a Digital Strategy will be critical to Ireland's success in terms of GDP, upskilling/transforming the workforce, attracting inward investments as well as cyber security, and achieving net-zero emission targets.

Ireland's wireless infrastructure is a foundational pillar of the overall digital connectivity strategy. Leveraging the innovative 5G systems over the coming decade, Ireland's wireless infrastructure will be pivotal to delivering limitless connectivity. 5G technology is different to the previous generation of wireless technology and has the potential to ensure that anyone and anything can connect anywhere and at any time, enabled by nationwide coverage, massive data rates and the low latency needed for all applications.

With limitless connectivity, consumers and business will use applications and be able to focus on their tasks without any concern for lost or poor connectivity. Mobile networks will need to adapt to demands as they develop and change, interact with applications to understand their needs, and support diverse types of devices. This will require the continued expansion of wireless communication, targeting full coverage, closing the digital divide, while supporting a dramatically higher number of devices that will be embedded throughout society.

Limitless connectivity will enable immersive learning experiences and access to quality training, acquiring new skills and knowledge will become an enriching lifelong journey for everyone. It will fundamentally reshape the way enterprises design, produce and deliver their products and services.

Wireless technology has the opportunity to support the move towards a low-carbon economy across many industries. More digital infrastructure is fundamental to many industries ambitions with regard to their growth but also to net-zero emissions targets. Industries will also need to ensure their workforces are developing with the appropriate skill and knowledge.

There is an opportunity for policy makers to support and help speed up the transformations required for Digitisation and remove barriers that are slowing progress. This includes barriers to network rollout as well as barriers to market readiness which will support the understanding and take-up of solutions/applications in the economy. Government subsidy support may be required to reach the connectivity, capacity, and quality networks to achieve geographic and population coverage. The mobile infrastructure and limitless connectivity will be paramount to Irelands' societal, economic, sustainability, and net-zero emissions ambitions

Consultation Questions

Question 1: Is the ambition level set out in the State's Digital Connectivity Strategy appropriate?

The Digital connectivity strategy is clear on how digital connectivity is being provided to premises. Through a combination of commercial investment in the telecommunications industry (covering ~77% of premises) and the National Broadband Plan (covering ~23% of premises), gigabit network services are being provided to the premises across the state. However, when considering wireless digital connectivity there is a lack of strategic intent to provide meaningful coverage outside of populated areas.

Ireland's wireless infrastructure is a foundational pillar of the overall digital connectivity strategy.

Future wireless access networks should be able to serve an exponentially growing traffic demand which will not only be in urban areas but also support rural economies, manufacturing, and agriculture outside of highly populated urban areas with consideration to outdoor and indoor performance and resilience.

The Government should consider publishing digital connectivity ambitions which include clear wireless infrastructure targets. The ambition should include 5G coverage and capacity targets with minimum expectations on consistent speeds, i.e., quality of service (QoS), time to content, and minimum throughput speeds. Targets could also be specific and in line with industry standardisation e.g., 3GPP releases.

It is unlikely that the coverage and capacity needs will be achieved through commercially viable deployments and market intervention is likely to be required to achieve the optimal socio-economic outcome, particularly for remote and rural coverage. There is a need for specific targets and potential interventions for 5G coverage for road, rail, agriculture, and the areas, where coverage would be more challenging based on commercial decisions

A critical component is the cost-efficient deployment of dense networks. The current mobile cell site grid was established during the deployment of 2G and 3G. More Macro cell sites are required to take full advantage of the 5G socioeconomic benefits. However, there are numerous deployment barriers that need to be addressed, including access to new sites, planning, and mast height. With today's power-efficient lightweight RAN portfolios designed to simplify rollout, it should be quicker and more cost-effective to deploy new sites. It is recommended that the Government establish a task force to tackle barriers to deployment and consider planning reform given the new smaller RAN footprint requirements.

Network energy performance will be critical, an acceleration in traffic should not mean accelerated energy usage. Sustainability is at the top of all agendas. Wireless communication already plays an important role here, and there is clear potential to further accelerate its contribution in enabling increased efficiency in the use of resources and support of new ways of living, making it a tool for sustainable change.

Where the 5G macro network cannot penetrate buildings indoors, 5G indoor small cell radios are required to deliver high per-user capacity and rate coverage everywhere. This will also improve performance in the macro network by offloading the traffic generated in hotspots. The 5G network platform creates a wireless environment where both indoor and outdoor networks perform perfectly and seamlessly, enabling the best end-user experience. Locations that require high-quality indoor 5G experiences fall into two broad categories: Consumer for locations such as airport terminals, shopping malls, and underground stations; and Enterprise and Public places like hospitals, convention centres, factories, and offices.

Nationwide wireless network capacity, coverage, and security is of utmost importance to ensure that individuals, both as customers and citizens, as well as businesses, are not left behind. To achieve the full potential of 5G users will need a consistent minimum throughput of around 20Mbps with a time to content of less than 1.5 seconds as outlined in the Ericsson Mobility Report November 2021[1]. Service providers are aware that a good user experience is key for driving customer satisfaction, thereby reducing churn and improving financial return. The Ericsson study to measure and benchmark the network performance required for a positive user experience suggests this minimum level 20Mbps should be possible at anytime and anywhere.
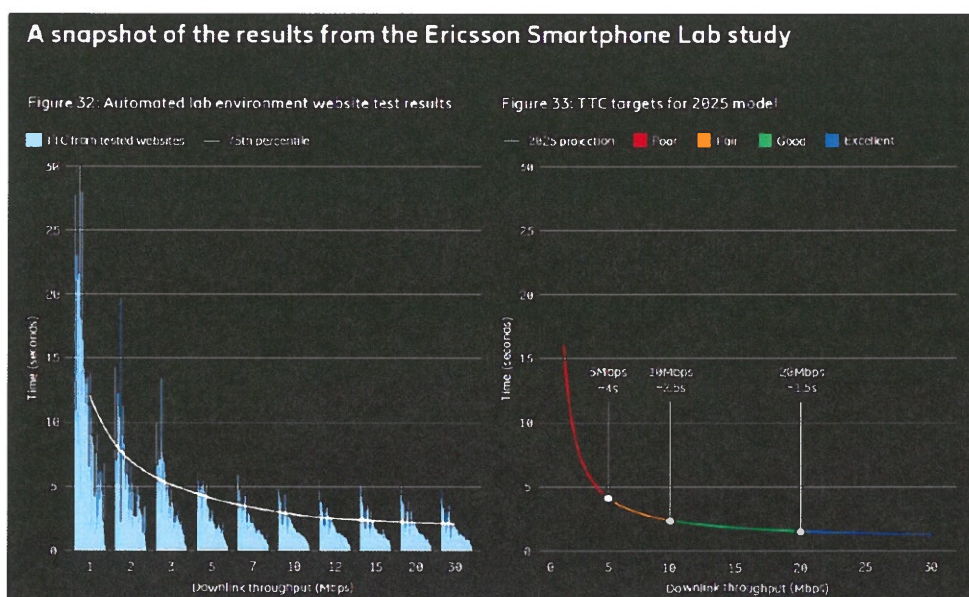

Figure 1- Measure and Benchmark of network performance required for positive user experience using Time To Content (TTC) from Ericsson Mobility report November 2021

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[1] Ericsson Mobility report November 2021

Question 2: The Department invites commercial operators to submit details of their existing or future planned networks delivering broadband services to premises with at least 1Gbps download speed? Details should include the list of premises that are or will be covered and the expected date by which the Gigabit broadband service will be made available to each premises.

There is an opportunity to consider including 5G Fixed Wireless Access (FWA) as a complementary technology to support and speed up the time to achieve Ireland's national broadband targets and reduce the digital divide. This could be particularly attractive for rural and less densely populated areas. With 5G rural coverage there is the opportunity to utilise the wireless infrastructure for 5G FWA, transport, agricultural, and rural use cases.

Question 3: Are the strategic enablers set out in the State's Digital Connectivity Strategy appropriate? Do these strategic enablers need to be amended? Are further strategic enablers, initiatives or measures needed?

Wireless infrastructure will be required in rural locations to enable capabilities such as smart agriculture and smart transportation. It is not always commercially viable for mobile operators to provide high capacity, low latency coverage in sparsely populated areas even though future use cases will demand it. It is likely that rural wireless infrastructure will require some form of state intervention and support to ensure there is 5G coverage everywhere as market forces alone will not achieve the optimal socio-economic benefits.

Smart cities, underpinned by smart infrastructure across energy, traffic, transport, water, waste, social, and buildings, provide a way to address the increased density and demand in growing cities. Policymakers and enterprises should work towards installing key digital connectivity building blocks for smart cities to succeed, of which a fundamental pillar is a comprehensive wireless infrastructure.

To reach the full potential of 5G and provide a universal 5G experience anytime, everywhere, a fully coordinated multi-layer network with low, mid, and high-band spectrum is needed. This will enable the required 5G performance and flexibility to serve multiple use cases with different requirements by securing that devices are connected to the right spectrum band at the right time and in turn optimising the network performance and efficiency.

Spectrum management is about efficient use of scarce resources and allocation of new spectrum for the highest societal benefit. It is also about global or regional coordination and harmonisation of spectrum usage to decrease the cost of technology by increasing economies of scale thereby maximising the affordability for all users.

Over the past 25 years, spectrum auctions have become a standard means of assigning high-value spectrum. Going forward Spectrum awards and renewal of spectrum need to be reasonably priced to allow for meaningful network deployments addressing the digitalisation policy objectives. Spectrum allocation should be aligned to economic and social policies by including coverage and capacity obligations. The pricing of Spectrum should reflect the coverage and capacity investment requirements. Policy makers should apply spectrum policies that incentivise network deployments rather than focusing on income for the treasury.

Harmonising the use of spectrum bands across geographies is essential to achieving mass-market conditions which in turn enables cost-efficient and competitive industrial devices and infrastructure.

The 5G spectrum guide[2] from GSMA has reports on the spectrum vision for 2030[3] including insights on mid band spectrum needs. GSMA have also called on Governments to License 6 GHz to Power 5G[4].

High band spectrum, mmWave deployments are expected to play a key role in the delivery of 5G use cases that produce significant volumes of data, which the bandwidth available in mmWave bands can help to accommodate. The 26GHz band will provide additional capacity in 5G networks for eMBB consumers in localised areas where there is a high concentration of eMBB use either outdoors or indoors. Additionally, location-specific use cases for the 26GHz band include those where there is a benefit from digitalisation of use, such as in airport terminals, train stations, shopping centres, offices, event locations, and tourist sites. Industrial-based applications are envisaged too, using the available bandwidth in the mmWave bands to provide very low latency connectivity such as for robotics, industrial machinery automation and industrial augmented reality/virtual reality.

It is critical to identify and address the barriers preventing the fast, efficient, and cost-effective deployment of broadband and 5G mobile coverage, with the appropriate resilience, security, and performance, working in collaboration with local councils, site providers, and operators, to develop policies that enable the digital connectivity strategy.

To align Irelands digital transformation and strategy with the European Commission's vision of a digital compass, a body or forum of industry leaders, telecom operators, technology disruptors, vendors and government policy leaders could be formed to drive the executive of the digital vision and support the roadmap and milestone to deliver the following:

- Workforce education, skill development, diversity and inclusion

- Secure and sustainable digital infrastructures

- Support Business in their transformation and take-up for digital transformation

- Digitisation of public services and critical infrastructures

On the 9th of March 2021, the European Commission presented a vision and avenues for Europe's digital transformation by 2030, the Commission proposes a Digital Compass[5], as outlined in Figure 2 below.

The Commission will pursue the EU's digital ambitions for 2030 through concrete terms targets and projected trajectories, a robust joint governance framework to monitor progress and address insufficiencies multi-country projects combining investments from the EU, Member States and the private sector.

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[2] **GSMA** 5G Spectrum Guide – Everything You Need to Know

[3] **GSMA** Vision 2030 Insights for Mid-band Spectrum Needs

[4] **GSMA** Calls on Governments to License 6 GHz to Power 5G

[5] Europe's Digital Decade: digital targets for 2030

SKILLS

GOVERNMENT — INFRASTRUCTURES

BUSINESS

Skills
ICT Specialists: 20 million + Gender convergence
Basic Digital Skills: min 80% of population

Secure and sustainable digital infrastructures
Connectivity: Gigabit for everyone, 5G everywhere
Cutting edge Semiconductors: double EU share in global production
Data - Edge & Cloud: 10 000 climate-neutral highly secure edge nodes
Computing: first computer with quantum acceleration

Digital transformation of businesses
Tech up-take: 75% of EU companies using Cloud/AI/Big Data
Innovators: grow scale-ups & finance to double EU Unicorns
Late adopters: more than 90% of SMEs reach at least a basic level of digital intensity

Digitalisation of public services
Key Public Services: 100% online
e-Health: 100% of citizens having access to medical records
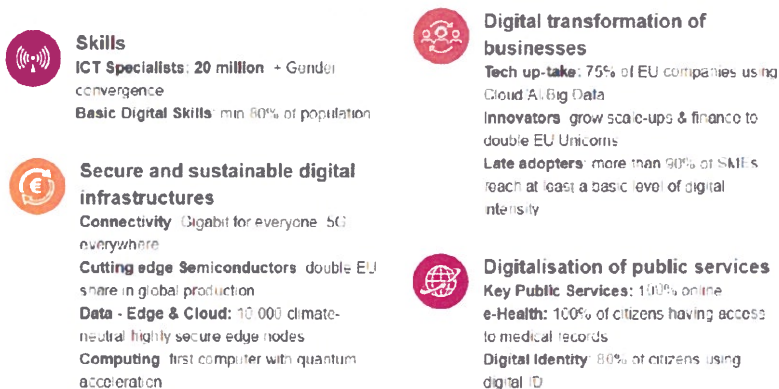Digital Identity: 80% of citizens using digital ID

Figure 2 - European Commission proposes a Digital Compass for the EU's digital decade that evolves around four cardinal points

Question 4 The Department welcomes any views on the State structures, agencies and resources needed to oversee and ultimately secure the delivery of the Digital Connectivity Strategy?

As shared in earlier answers, it is critical to identify and address the barriers preventing the fast, efficient, and cost-effective deployment of broadband and 5G mobile coverage, with the appropriate resilience, security, and performance, working in collaboration with local councils, site providers, and operators, to develop policies that enable the digital connectivity strategy.

It may be appropriate to establish a new forum/industry body/government group to focus on the execution of the digital strategy.

The strategy enablers that could be considered by a new government/industry body include but are not exclusive to the following areas:

1. Using funding collaboratively for research and development (e.g. test cases will drive enterprise demand and take-up) and investment in people and skill.

2. Ensuring Spectrum is used effectively and appropriately.

3. Ambitions and milestone for uses of new applications, Smart Cities, AI industries using new wireless infrastructure can be met with targets to roll-out coverage, connections, capacity, performance, security and resilience for limitless connectivity.

4. Breaking down barriers that may prevent efficient, fast, and cost-effective deployment of broadband and 5G mobile coverage and ecosystems for the deployment of Smart City application and services including customer attitudes (including disinformation e.g. that 5G is harmful to health).

5. Ensuring the digitisation transformation and infrastructure is supporting net-zero emission targets.

6. Looking at more appropriate technologies (FWA/fixed broadband) for rural areas, schools, critical infrastructures and industries for universal service obligation and ambitions that may not be covered under urban coverage and capacity or economically driven decision by telecom operators.

7. Review the need for state intervention to achieve coverage with appropriate resilience, security and performance, particularly in rural areas.

Question 5: The Department welcomes any views on how to ensure a sufficiently skilled workforce, with the necessary competence and experience, is available to industry and the State so that Digital Connectivity Strategy can be delivered? The Department would welcome suggestions on the State's role in encouraging the development of this workforce?

Without digital skills, connectivity, new technologies and trust are of little value and we recommend that the government foster a digital ready and inclusive society; one where digital skills gaps are mapped and current and future employees are trained, upskilled or reskilled for the new world of work. It is key to have national strategies to address skills gaps, as well as improving digital skills for students and teachers at schools and universities.

Given that, by 2030, it is forecast that two-thirds of the world's workforces will depend on 5G connectivity, it is paramount that government, industry and institutes work towards closing the digital skills divide and overcome digital exclusion.

From AI, to robotics, to app development, the rapid pace of change means academic institutions will invariably require the support of the IT industry to take digital learning beyond a basic level, as well as moving students beyond theoretical knowledge. Public private partnerships and industry collaborations will be key.

By 2030, wireless infrastructure will have been shaped by 5G for 10 years. Industry and academia research has started to define the vision of what the network will be able to deliver in 2030, exploring the technology components that will make it possible. 6G research is ramping up. Increasing expectations from society, industries, and consumers, combined with new advanced technologies being developed, will eventually give rise to challenges beyond what 5G can meet. Figure 3 below outlines some of the key technologies that will shape the future of wireless infrastructure.
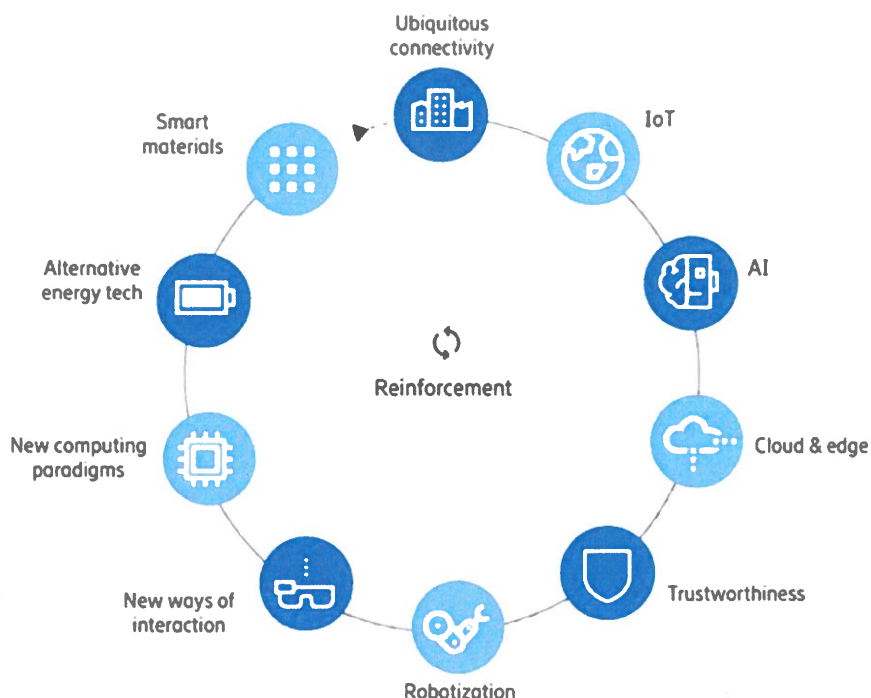
Figure 3 - Technology forces driving the wireless infrastructure industry forward

Future wireless infrastructure networks in the 6G era will enable a fully digitalised, automated, and programmable world of connected humans, machines, things, and places. All experiences and sensations will be transparent across the boundaries of physical and virtual realities. Traffic in future networks will be generated not only by human communication but also by connected, intelligent machines and bots that are embedded with artificial intelligence (AI). As time goes on, the percentage of traffic generated by humans will drop as that of traffic generated by machines and computer vision systems rises, including autonomous vehicles, drones, and surveillance systems. Autonomous deployment, operation and orchestration will be an inherent capability of the network platform to enable cost-efficiency. The management and operation are becoming more specified in the industry to both support increasing automation and reduce the integration costs incurred by a fragmented operations support system (OSS). This allows increasing innovation targeting support for different vendors applications on an industry aligned automation platform.

It is critical that the government, industry, and institutes work towards ensuring the availability of these key critical technological skills to be able to design, build, operator and manage the future digital infrastructure.

Question 6: The Department welcomes any other general observations and views on the State's Digital Connectivity Strategy and how it can be improved?

The pivotal role that the digital infrastructure plays in delivering critical societal, economic and governmental functions has become clearer than ever before. To bring to life the future that is enabled by the digital connectivity strategy, it is appropriate to establish a set of visual stories that highlight the profound impact of limitless connectivity on all aspects of life, from education, business, entertainment through to climate action.

To support this vision Ericsson has developed the following material: -

- Discover a world of new possibilities
- Our technology challenges for a post-mobile society
- 10 Hot Consumer Trends 2030
- The future of enterprises

For further information please contact:

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Head of Ericsson Ireland

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About Ericsson

Ericsson enables communications service providers to capture the full value of connectivity. The company's portfolio spans Networks, Digital Services, Managed Services, and Emerging Business and is designed to help customers go digital, increase efficiency and find new revenue streams. Ericsson's investments in innovation have delivered the benefits of telephony and mobile broadband to billions of people around the world. The Ericsson stock is listed on Nasdaq Stockholm and on Nasdaq New York. www.ericsson.com