

**Cradlepoint submission
to
The Australian 5G Innovation Initiative
—round one—discussion paper
11 December 2020**

Overview

Cradlepoint welcomes the opportunity to provide a submission to the Australian 5G Innovation Initiative—round one—discussion paper.

We congratulate the Government on this initiative. We believe it will accelerate the development of innovative applications for 5G and enable Australia to realise benefits from 5G comparable to those that have been identified elsewhere.

A [recent report](#) prepared by Analysys Mason focused on innovative new use cases and the different environments that 5G is designed to support in Europe.

It looked at 5G-enabled digitisation across a range of use cases such as smart factories, mining, and healthcare and hospitals. It found that 5G networks in Europe could deliver around EUR 210 billion (\$A343B) in benefits at a cost in the region of EUR 46 billion (\$A75B).

This is in addition to an Australia-focused [2018 study by Deloitte](#) stating that “recent economic modelling suggests that, by 2030, 5G networks could be adding up to 0.2% to productivity every year. This would equate to between \$1,300 and \$2,000 in additional Gross Domestic Product (GDP) per person after the first decade of the rollout, or around \$50billion in additional GDP.”

About Cradlepoint

Cradlepoint specialises in technology for the edge of wireless networks — LTE and 5G. Our technology serves more than 20,000 customers, including 3,000 public services organisations. Between them they operate more than one million Cradlepoint network edge devices.

These devices are supported by our cloud-based subscription service, NetCloud, that provides management, security and networking services to our customers.

In July this year, Telstra [announced](#) that its Enterprise customers are the first in the world to be able to purchase and deploy Cradlepoint 5G wireless network edge solutions – a series of adaptors and routers engineered to deliver the speed, security, reliability and manageability required by Enterprise 5G customers, on Telstra’s 5G Network. In October this year, Australian company [Taylor Construction completed a trial of and rolled out these 5G business solutions](#), with huge business impact that shows the potential of 5G for Australian businesses.

Cradlepoint applauds the continued support for early innovators using 5G business solutions, such as Taylor Construction, to boost competitiveness and unlock greater potential across key industries to prepare for the step change that 5G will enable. As the first-mover in 5G for the enterprise, Cradlepoint is currently working with other businesses in Australia on trial use cases and is enthusiastic about helping shape the nation’s 5G business future.

Our responses to questions raised in the discussion paper are set out below.

TESTING INNOVATIVE USE CASES FOR 5G

Do you have any comments on the types of use cases that the Initiative is seeking to support?

Many 5G use cases have not yet been conceptualised. Many widely used applications that today we take for granted, such as ridesharing and being able to watch high quality video on our mobile phones were made possible only when LTE 4G technology became available.

Once the commercial sector has realised the true ultra-reliable, low latency and high speed benefits of 5G, we will see

organisations and forward-thinkers imagine and bring to life many commercial and socially-beneficial use cases in and beyond the project areas outlined in the consultation paper.

These could include:

Immersive Experiences

For industries such as retail, it will be possible to provide immersive experiences for customers who want to try on clothes virtually online or in-store. Virtual dressing rooms could have large, high-definition video screens on which shoppers will be able to see themselves, life-size, 'wearing' different clothes. The technology could give bricks and mortar stores a new weapon in their battle with online retailers.

Augmented Reality (AR)

The applications for augmented reality are enormous and already well established where their bandwidth requirements can be accommodated with current mobile technologies. The increased bandwidth and low latency of 5G will enable many more real-time, bandwidth intensive AR use cases. For example, firefighters wearing AR enabled facemasks would be able to see the floor plan of a burning building as they enter, as well as the locations of their colleagues.

With social distancing becoming a headache for entertainment and travel industries, augmented reality can also provide options for these struggling providers to offer virtual and augmented reality options for sporting, music, other entertainment and travel experiences.

Construction industry

Australian-based Taylor Construction is already making use of the 20 times increase in bandwidth, and the lower latency, that 5G offers over 4G to support a range of bandwidth and latency sensitive connected devices and applications on its construction sites.

Wired broadband is unsuitable for building sites: it takes a long time to deploy, is complicated to decommission, and is difficult to relocate as a project progresses. As a result, to date

applications have been limited to the bandwidths available on LTE 4G.

Other 5G applications being explored by Taylor include:

- Holographic Building Visualisation. Taylor employees and customers on-site can wear smart glasses and see a virtual model of a building under construction, or elements of the construction process such as structural steel, framing, or electrical schematics.
- Real-Time Design Display. Company staff are able to make changes to digital blueprints in real time and display the updated design on tablets and large monitors on-site.
- Large-Site Failover. Taylor uses expensive optic fibre links to provide backup for on-site IT resources. It is investigating replacing these with 5G: delivering comparable speeds and gaining connection diversity.
- Structure monitoring. Smart sensors fixed to reinforcing rods in concrete send data that helps Taylor determine if concrete has been poured correctly. These sensors will be able to track any shifting of the concrete for many years.

Industry is ready to exploit 5G

[Cradlepoint Australia commissioned leading technology analyst firm Telsyte](#) to query IT decision makers in medium to large organisations for their views on the potential of 5G.

Seventy-three percent said they planned to either start using 5G for wide area network (WAN) connectivity, or to increase their usage of 5G in the next 12 months. Forty-five percent are already using 4G LTE for WAN.

Reasons cited for using 5G included: improved network coverage (58 percent); increased flexibility (48 percent) and the ability to introduce new services (43 percent).

These responses suggest that Australian businesses have high expectations of the performance and potential benefits of 5G to

help them adapt to a changed world and to exploit new opportunities for business growth.

Two-thirds of organisations surveyed said they were confident or very confident 5G would deliver the promised business benefits within the next 12 months, and only 11 percent are not considering using 5G connectivity.

Respondents anticipated 5G bringing benefits other than increased speed. More than 60 percent of respondents listed each of the following as benefits they expect 5G to bring:

- Business benefits
- Improvement over 4G
- Potential for artificial intelligence and augmented reality
- Reliability
- Low latency
- Coverage

Instant connectivity

One of the biggest gains of 5G over earlier, wired technologies is its ability to provide very high bandwidth connectivity at very short notice. This could be particularly valuable to use cases like aged care facilities placed into lockdown and with limited bandwidth on their fixed broadband services. 5G would enable residents to have video calls with family members, and enable staff in different homes operated by the same provider to communicate, meet virtually and collaborate over video with new networks in different locations being quickly set-up to avoid distressing downtime.

Pop-up Covid-19 testing facilities in hot spots have been a feature of the response in many countries. While LTE has been invaluable in these instances, 5G technology will be able to immediately provide these facilities with mission-critical communications for essential technology, such as laptops, tablets, printers and medical equipment for these facilities.

Improving the retail experience

Retailers today are serving customers in new ways and new places such as seasonal pop-up shops and self-serve kiosks. Such facilities need reliable, high speed connectivity. Retailers

have used 4G to support such facilities and are looking at how they can use the greater speed and capacity of 5G to expand their offerings and increase efficiency with, for example, interactive digital displays, virtual reality and establishing pop-ups and temporary outlets in times of emergencies requiring relocation.

Benefits for freight and logistics

The freight and logistics industries stand to gain huge benefits from 5G, and given the importance of road freight to supporting communities spread across Australia's vast distances, this should be an area of focus for the government's 5G initiative.

5G will enable cargoes to be tracked over long distances with optimised coverage. Improved geolocation technology will provide visibility into delays. 5G will enable organisations to optimise their routes through improved visibility, and avoid unnecessary trips and inefficiencies.

In high population, high traffic density areas the greater capacity of 5G will ensure tracking technologies are not compromised by network congestion.

Are there any technical, regulatory or other barriers to implementing 5G use cases? If you have identified barriers, can you suggest ways these barriers could be overcome?

The most obvious barrier is access to 5G, a hurdle which will be overcome as the carriers continue to roll out their 5G networks to much of the population.

It is worth considering that gigabit LTE is a potential alternative test-bed for some trials where 5G is not readily accessible. Many cases can have a small-scale trial on gigabit LTE, then graduating onto 5G before broader rollout.

DEMONSTRATING 5G USE CASES IN DIFFERENT REGIONS

What are your views on the level of maturity of 5G applications available to be trialled, and are there particular sectors which could best demonstrate 5G's productivity benefits?

Construction

The example of Taylor Construction cited above is a clear demonstration of the productivity benefits 5G can already bring to the construction sector.

Healthcare

High resolution video and fixed images are essential for many telehealth applications, for example to enable radiographers to diagnose conditions from X-rays or to enable physicians to inspect skin lesions for signs of cancer.

There is already discussion of 5G being used to support remotely controlled robotic examination of patients with infectious diseases, protecting the physician from the risk of infection.

5G is "[ushering in a Golden Age for remote healthcare](#)" (p17) It will enable quicker downloads of patient data, including large files such as MRIs, and will create more reliable telemedicine by reducing video lag and expanding internet access – two of the biggest factors impeding remote care on slower networks.

Healthcare providers will be able to collaborate from different locations using augmented reality and view 2D and 3D content together without any detectable delay.

In an emergency the high bandwidth of 5G [can enable the very rapid transfer of patient data](#) to immediately inform doctors treating a patient of whom they may have almost no knowledge.

What locations offer the best opportunities to deliver 5G projects, and are there any barriers to delivering projects in particular locations or geographic regions?

There are 5G applications in the pipeline for almost every geographic region in Australia: the only barrier is coverage.

Transport applications connected over 5G will soon deliver benefits throughout Australia and in coastal waters. For example, 5G solutions for the maritime industry will enable higher speed and lower cost compared to satellite connectivity, making it ideal for near-shore activity and in turn, enabling the next wave of maritime communications. Applications could include IoT enabled cargo that allows remote cargo monitoring and remotely controlled autonomous vessels.

Healthcare applications can deliver benefits to aged care and other facilities in urban areas but some of the greatest benefits will be in the provision of services currently only available in major cities, to remote Australians as 5G networks continue to roll out nationally.

Bushfire prone areas will benefit from 5G coverage and the applications it is able to support. One idea that has been floated is for fleets of drones, controlled and connected over 5G, assessing bushfires and disseminating information live to a control centre over 5G.

In many cases, applications for rural areas can be developed and tested in urban areas prior to rural coverage becoming available.

Given the quantum of funding, what type and scale of projects could the Initiative appropriately support?

The initial focus should be on 5G applications that support economic recovery and healthcare.

Construction is a sector which stands to benefit hugely from advancements which harness the power of 5G. It is an industry in which fixed connectivity has limited usefulness because

construction sites are constantly changing. 5G enabled embedded sensors in new buildings will help ensure building quality can be monitored in real time during construction, potentially pre-empting major structural faults that can be extremely costly to remediate, and have potentially disastrous consequences after construction is complete.

In addition, productivity gains from things like on-site access to digital CAD images and onsite design alterations enabled by 5G speed and bandwidth, will help increase speed-to-completion. This may assist in driving growth in construction as a key part of Australia's post-COVID economic recovery.

Retail is in a reinvention phase following 2020. As referenced previously, temporary pop-ups, relocations and new in-store experiences such as augmented reality will all be crucial to retail adapting to the changed social environment. We've already seen retailers embrace LTE as part of 2020 survival for pop-ups and relocation. 5G can help them move from survival to prosperity by offering new ways of shopping to consumers, assisting the industry and as an economic driver for the country.

During COVID, telehealth and temporary health premises came into sharp focus. Pop-up clinics relied on LTE, given the speed of set up and often uncommon locations they had to be stood up. With 5G, such activities could deliver critical patient information more swiftly between clinics and testing facilities. In addition, 5G can create even smoother telehealth services relying on video and transfer of large medical files, such as x-Ray or MRI images for example.

What are your views of the proposed requirements for joint applications, grant agreements, grant value and the payment structure of the Initiative? Are there other program requirements that should be considered?

We support the proposal to allow joint applications. These will enable synergies between 5G technologies and use cases to be explored and developed, leveraging the differing expertise and experience of the submitting partners.

We applaud the Government's financial commitment to funding 5G use cases. We believe this approach creates scope for some truly innovative and productivity-enhancing use cases to be trialled and explored.

We understand the Government's decision to stagger project payment, but we believe the initial payment must be sufficiently substantial to enable the recipient(s) to make the most of the trial and fully explore the potential of 5G to support their chosen use case, without being prevented by lack of funds from achieving an optimal outcome.

The low latency of 5G is a distinct feature that sets 5G apart from earlier technologies. It has huge potential to support applications such as virtual reality where near real-time response is required, but to fully demonstrate its potential is likely to require significant investment in application development.

Do you have any comments on the eligibility requirements, including the types of applications eligible for funding, the funding of network infrastructure, and whether the criteria will encourage participation from a variety of applicants?

There should be scope for some portion of the grants to support development that leads to implementation of a commercial application, so long as much of the R&D has been executed prior to the grant being received and there is a clear path to implementing a commercial application.

This would enable grants to support innovation alongside implementation, which is where much of the new 5G benefits will be realised.

The eligibility criteria should be explained clearly to all vendors, partners and end-users to ensure strong understanding of the initiative and drive enthusiasm for participation. Example use cases, a list of applicable organisations and examples of

possible joint applications would encourage uptake of the initiative.

In what timeframe could projects under the Initiative be feasibly implemented?

It is not possible to put a general figure on timeframes. These are dependent on the scope of individual projects and wide variations are likely.

However, as an example, our project with Taylor Construction project from initial discussion to trial completion and implementation was completed in 3 months.

What do you consider are the best ways to promote 5G use cases within industry sectors and more widely? Do you anticipate any barriers to sharing case studies?

Telecommunications carriers and vendors participating in the use cases should be encouraged to share their experiences widely with their respective industry networks.

All grant recipients should be required to produce and promote case studies of their projects — respecting commercial sensitivities — so that the learnings can be made available to broader industries.

There should be communications effort — online and through other channels — to promote the scheme and the projects it has enabled.

Do you have any comments on the proposed assessment criteria, including their ability to support a variety of projects from diverse applicants?

The criteria should also acknowledge that while speed is one feature of 5G, its benefits are much broader, including low latency, high capacity, ability to act as a wired failover or replacement and more. Ensuring the criteria acknowledges this will see the true economic and social potential of 5G come to

