



100GIG

Bendigo Loddon Campaspe Region

PROSPECTUS

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Acknowledgement of Country

We respectfully acknowledge that the Loddon Campaspe Region encompasses the traditional lands and waters of the Dja Dja Wurrung, Taungurung, Wurundjeri, and Yorta Yorta people. We pay our respects to them, their culture, and their Elders past, present, and future.



Loddon Campaspe Regional Partnership

Foreword

Loddon Campaspe is a broad, diverse, and growing region with a range of attributes and advantages that can be leveraged to establish ourselves as a clear regional leader in the digital economy and future of work.

Our economy is underpinned with long standing and successful industries across agriculture, retail, health, construction, mining, and manufacturing and our regional community holds aspirations of creating thriving sustainable digital economy through, in a significant part, by increasing our digital capability (skills), capacity (hubs), and connectivity (infrastructure).

To keep pace within a global digital economy advancement, it is estimated that to deliver on our potential a total investment of **\$283.4 million is required over the next ten years which is expected to drive regional benefits estimated at \$2.2 billion over the next 30 years.**

Proactive investment in three areas; digital skills, digital capability, and digital connectivity is critical to maintain our relevance in a modern global economy effectively 'uplifting' our digital impact and effectiveness for the region. Investing in these three areas also prepares the region to align workforce capability and capacity for the 'future of work' allowing the region to keep pace and take further advantage in the emerging digital economy.

Loddon Campaspe Region is home to sophisticated businesses that are collaborative and innovative who have told us through extensive engagement they have a significant unmet demand for digital advancement. To meet this demand, we have come together and identified the immediate and longer-term

critical investments needed to uplift the "digital ecosystem". Building on the Loddon Campaspe Regional Digital Plan, this prospectus requests investment across a suite of specified opportunities leveraging public, private, and education sectors.

The investment case outlines an extensive range of staged and curated investments for

- Digital skills- preparing our workforce (\$920K immediately)
- Digital capability - creation of a Regional digital innovation hub and spoke model (\$6.35M immediately)
- Digital connectivity – supporting investment in digital infrastructure enhancements (\$4.3M Immediately)

Our region has the potential to realise significant economic and social benefits by delivering the investment requests outlined in the Loddon Campaspe Gig region prospectus.

I would like to thank everyone whose efforts have made the 100 Gig Bendigo and Loddon Campaspe Region initiative possible, and I am excited to see the changes the Loddon Campaspe region will undergo in the years to come as we work towards targeted digital investments.

David Richardson
Chair, Loddon Campaspe Regional Partnership

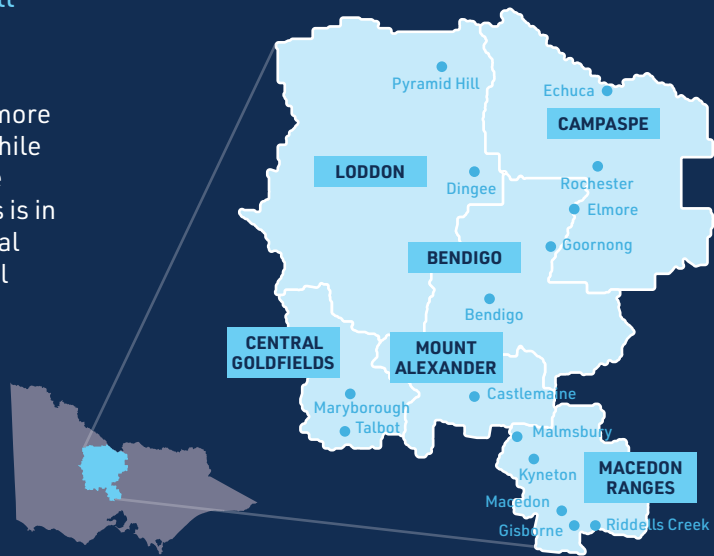
1 The Case for Change

As the world becomes more digitised, the need for connectivity to advance digital services is ever increasing, as is the risk of a sharp new digital divide, if investments are not made. Australia currently sits around 59th in the world index for digital connectivity well below comparative economies.

COVID-19 has seen dependency on connectivity increase by up to 80% or more to both households and businesses. While all communications are critical, mobile capability and coverage for businesses is in jeopardy of underinvestment in regional Victoria, not keeping pace with a global competitive marketplace, nor realising the potential benefits that accrue.

The Loddon Campaspe region is a key economic region within Victoria and Australia, with digital connectivity fundamental to people's lives, personally and professionally.

More than ever connectivity and technology are sustaining and supporting the economic and social development of our community, providing access to education and employment, delivering economic opportunities, reducing the barriers of distance and participation, and is ever more critical during times of crisis.



1.1 Challenges

There is a clear case for targeted accelerated intervention and investment to improve capability, capacity, and connectivity in the Loddon Campaspe region, with significant unmet demand and continued problems of zero to no connectivity in critical areas across the region.

The Loddon Campaspe Gig Region initiative responds to identified unmet digital needs and proposes to overcome core capability challenges enabling a more socially connected and economically competitive community. The region's economic challenges include, but are not limited to

- Addressing the 'digital divide' between regional and metropolitan areas and avoiding the 'stagnation gap' on digital adoption evidenced by our businesses
- Building an entrepreneurial ecosystem to

initiate new and support existing startups and scaleups

- Better utilisation of existing infrastructure, platforms, and assets to support other digital initiatives across the region
- Addressing supply shortages such as fixed broadband, mobile coverage, Internet of Things (IoT), Public Wi-Fi, Access, and Digital Skills
- Building resilience and futureproofing against disruption or economic shocks.

The risk of not investing in digital skills, capability and infrastructure could see the proliferation of non-competitive industries (or even sectors), or industries that become increasingly financially unsustainable. At the same time the region is also not realising the full potential to enable the economy to thrive in the modern and global economy, it is held back with a real risk of becoming irrelevant.

Our regional advantage

The Loddon Campaspe Regional Partnership's vision is for the region to be a national regional leader in the creation of a robust and sustainable future digital economy that will enable and underpin the future sustainable growth, competitiveness and resilience of our businesses and industries and drive more balanced social and economic outcomes.¹

The region has the fundamental attributes to enable this including

- 1. Some existing digital infrastructure for high-speed capacity in Bendigo** – Bendigo city centre with a relative minimal level of investment can expand access to deliver the cheapest and fastest (100Gbps) internet services in the country and provide a distinct comparative advantage for the community and attract significant investors.
- 2. Favourable geography to support high-capacity infrastructure deployment** – Loddon Campaspe's linear geography and clusters of employment precincts along this corridor present cost/benefit advantages to deploying a network of digital innovation hubs which can be relatively easily accessed by most of the region.
- 3. Sophisticated business users driving demand for skills and services** – To get the most out of digital infrastructure and attract and retain the right sort of talent, a region needs a critical mass of sophisticated technology users. Loddon Campaspe is establishing itself in this regard and home to organisations like Clear Dynamics, La Trobe University, Coliban Water, Bendigo and Adelaide Bank, Bendigo Health and Bendigo Telco, whom deployed Australia's first regional data centre.
- 4. Collaborative business and supportive community environment** – The Loddon Campaspe local governments share a 'regional' approach to economic and social development, placing a high value on initiatives that take a whole-of-region approach.

Loddon Campaspe unmet needs hotspots

Fixed broadband and mobile access



¹ Loddon Campaspe Digital Plan

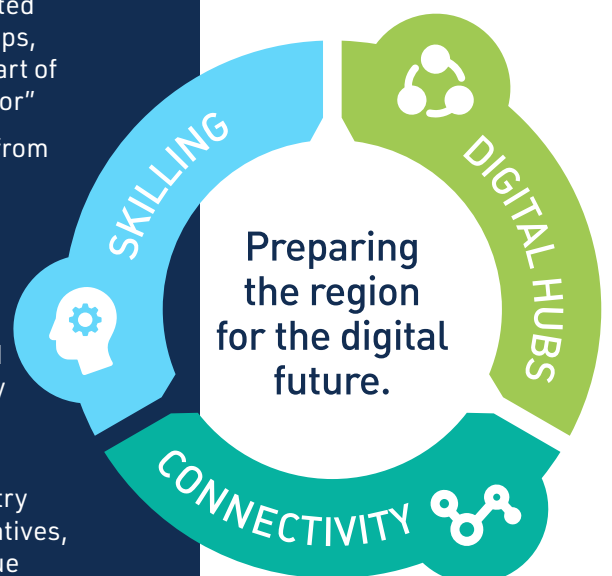
2 Developing our future digital economic ecosystem

This prospectus identifies three strategic areas for targeted enhanced investment formulated to digitally supercharge the region:

- **Digital Skills** – building the capacity of the workforce
- **Digital Capability** – investment in regional digital innovation hubs
- **Digital Connectivity** – Investment in digital infrastructure

The region's vision is to:

- Obtain and **accelerate investment for digital connectivity** infrastructure (gaps in mobile network coverage and bandwidth services – testing and mapping of existing fibre broadband assets for backhaul and last mile), specifically in places where NBN has no further immediate plans to improve its network
- **Remove significant barriers to broadband access** whether financial, physical, or digital literacy related with clear investment for proposed mitigations
- **Unlock 100 Gbps opportunities** and create the cheapest and fastest internet services in the nation in Bendigo City Centre by delivering investment in the “last mile” connectivity fibre (comparative existing infrastructure advanced exists in the deployed and underutilised current broadband infrastructure)
- **Deliver new “digital innovation hubs”** to support economic development in business startups, attracting and relocated digital businesses from metro, entrepreneurship, startups, scaleups and business associations – building out the start of and establishment of an “Employment Innovation Corridor”
- **Facilitate the supply and development of digital skills** from local education and research stakeholders with a high-level quantification of current and future demand for IT/high tech and digital skills from industry sectors and key business forums and associations, including a focus on the future of work opportunities
- **Solicit additional private sector investment** in skills and collaboration frameworks from global digital technology providers.
- Ultimately **create new jobs** (jobs of the future) and future significant public/private investment in key industry sectors – with specific digital enablement (skilling) initiatives, clarifying the investment required, and quantifying value created.





2.1 Digital Skills

Accelerated digitisation, coupled with remote ways of working, means reskilling and upskilling is required and that a roadmap and pipeline of future skilling opportunities are implemented. Prior to COVID-19, 75% of businesses reported they were concerned about shortages of digital skills within their industry.

After significant consultation, this investment prospectus landed on three industry led core initiatives which will drive the need for digital skills-

- Internet of Things (an existing strength)
- Artificial Intelligence (cross industry partnerships and capacity building)
- Robotics & Automation (focussed on output and export originated sectors - manufacturing and food processing)

The Challenge: There is a widening stagnation zone in the uptake of digital technologies in the region and lack of digitisation and automation uptake will impact on important industries in the Bendigo Loddon Campaspe Region into the future

The Opportunity: Up to \$700 million in benefits through increased economic activity and employment for the region by building an adaptive workforce that can meet changing shifts in demand for different skills in the new economy. Co-investment opportunities for these funding requests is possible.

Success Criteria: Grow the number of people employed with IoT, Artificial Intelligence and Robotic and Automation skills and the number of businesses accessing these skills within the region to provide sustained economic growth building to 2030.



IMMEDIATE REQUIREMENTS

Project	Funding requested
Digital Skills coordination and the future of work initiative (\$400K Future of Work) (4*\$120 = \$480k 3 Day week coordination) (\$40k Roadmap)	\$920K/4years Y1 \$560K (1 Year) Y2 \$120 (3 years)

Project description: Digital Skills and the future of work initiative

Aims: To build a digital skills capacity region wide

Outcomes: Digital skills Roadmap which outlines the specific relationships and pathways for the 'future of work' on and an effective and progressive digital skills ecosystem embedded into the education to employment ecosystem



FUTURE INVESTMENTS

Longer term progress on Digital Skills – Areas of Specialisation	Year 3 onwards CAPEX Funding sought	Subsequent OPEX Funding required
Internet of Things Future Skilling Partnership	3.9M	9.8M
Artificial Intelligence Future Skilling Partnership	5.5M	9.8M
Robotics & Automation Future Skilling Partnership	4.6M	9.8M



2.2 Digital Capability Hubs

The case for accelerating investment in the new digital ecosystem is proposing the development of a cross-sectoral place-based digital innovation 'front door' and proposed expansion plan for growing spokes. Requiring \$11.5M total over five years - consisting of a \$6.35M request of Government and private sector funding of \$5.2M.

To address gaps in the region's innovation performance and address unmet demand by industry (the stagnation zone), an integrated Digital Innovation Hub model is recommended. The model involves building a distributed capability that brings together the best talent and technology to support firms to pursue digital innovation. That capability needs to catalyse (rather than duplicate) what is "front door" operator needs to provide a brokerage service.

The detailed feasibility study outlines a staged approach to develop a Digital Innovation "front door" with the opportunity to create "Spokes" across the region.

Initially Bendigo* and once established investigate partnership opportunities for creating spokes with

- Echuca, and Maryborough
- Castlemaine, Gisborne, Kyneton & Heathcote
- Wedderburn, Rochester, Woodend, and Rushworth

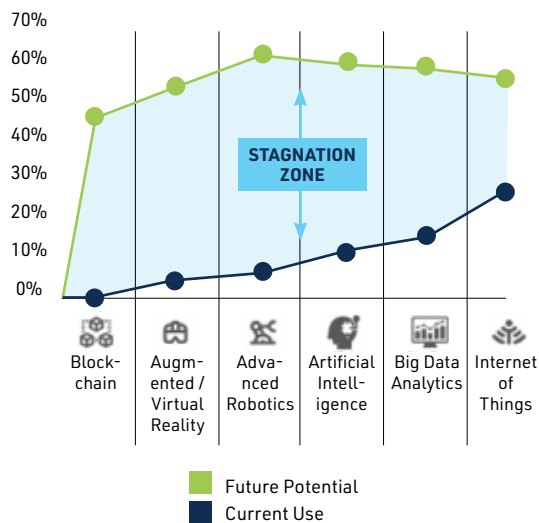
The purpose is to design, implement and operate Digital "innovation" Hubs across the region, uniting existing initiatives under a single program and deliver additional ongoing programs to further develop and grow the innovation, entrepreneurial and digital industry ecosystem for an initial 5-year period.

Outcome:

This clear focus of local digital technology creation and commercialisation as a driver of economic growth can help our region both support and diversify its economy from traditional industries to build them out around more knowledge-intensive sectors of growth that generate export income and create jobs locally in a global marketplace.

The region is seeking to capture numerous economic benefits by investing in digital innovation and entrepreneurship:

Current versus future potential use of technologies



1. Make existing firms more competitive, efficient, and globally integrated
2. Create new, sustainable jobs in tech-intensive domains
3. Provide skills that will help individuals and firms thrive
4. Increase inclusivity for all sectors and workers
5. Maximise value from the region's investment in digital infrastructure.

The Challenge: The Region Will Not Realise Economic Benefits Without Investment in its Digital Innovation Capacity and Capability

The Opportunity: Up to \$800 million in benefits through increased economic activity and employment for the region.

Success Criteria: The region's future productivity and prosperity will be driven by digital innovation and entrepreneurship. The benefits of digitalisation to the wider Australian economy are significant; digitalisation is forecast to add \$315B to the Australian economy over the next 10 years and create up to 250,000 new jobs by 2025 as stated by Prime Minister and Cabinet digital economy strategy.



IMMEDIATE REQUIREMENTS
(Digital front door)

Innovation Hub & Spoke capability and capacity	
Creation of a Digital Innovation "front door" in Bendigo	\$11.5M/ five years
Government investment sought	\$6.35M
<i>Private Co-investment following</i>	<i>\$5.20M</i>

(a detailed cost benefit study was commissioned by the team was undertaken by Vector Consulting which is available separately to this report)



FUTURE CONSIDERATIONS
(comprehensive Hubs)

Bespoke Innovation/ Startup/ Scaleup Hub & Spoke including Facilitates	FY2022 CAPEX Funding sought	2022/23-2028/29 Subsequent OPEX Funding required
Bendigo, Echuca & Maryborough	23.4M	7.8M
Castlemaine, Gisborne, Kyneton & Heathcote	31.2M	8.0M
Wedderburn, Rochester, Woodend, and Rushworth	39.0M	8.0M





2.3 Digital Connectivity

The region has some significant digital connectivity strengths and advantages whilst at the same time significant challenges. To realise the high-speed digital economic opportunity for the region, a business model for network investment 'uplift' is required. In fact, the regional City Centre (only) of Bendigo is likely to have some of the fastest and cheapest internet speeds in the nation (100 Gbps).

The regional connectivity gaps report identified several towns and centres within the region that are served with connectivity infrastructure that is arguably not fit for purpose or scalable for the demand requirements in the coming decades.

A clear case for additional investment in these areas is demonstrated in the detailed business case, noting the business case does not encroach or consider the future planned investments from NBNCo. it focusses on regional wide digital uplift and backhaul opportunities that will future proof the region for the required enhanced digital capabilities over the next decade, or significant acceleration required in region wide infrastructure deployment.

The map below shows a potential feasible hub – spoke fibre backhaul and interconnect network uplift treatment for the region. Usage of Victorian State Government owned network assets (owned by VicTrack) would be required to be utilised to make this potential scenario feasible.

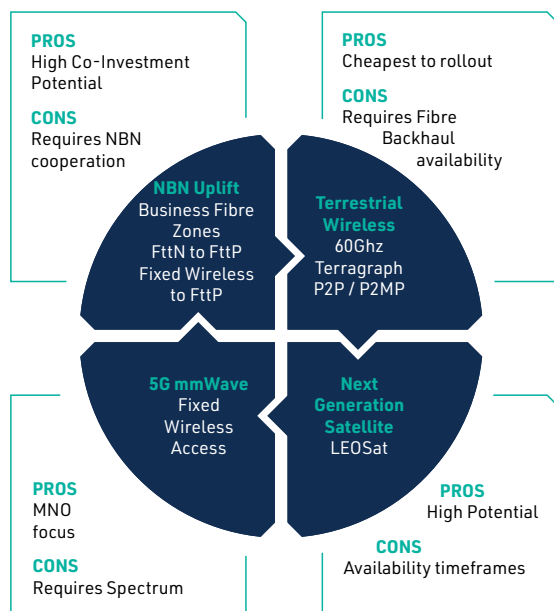
Potential Fibre Backhaul & Interconnect Network Uplift



The Business Model for 100 Gigabit City Region Network Implementation

Fibre Backhaul & Interconnect	<ul style="list-style-type: none"> • Provide IP Transit and Capital City / Internet / Cloud interconnect • Providers include Telstra, Vocus, Optus, VicTrack, AARNET • Can be provided over Dark Fibre or Managed Service
Access Networks	<ul style="list-style-type: none"> • Provide last mile broadband over Fibre, Fixed Line, Cellular or Wireless networks • Technologies include Fibre to the Premise / Curb / Node, 5G / 4G / 3G Networks, Terrestrial Wireless (P2P / P2MP / Terragraph), Satellite (GEO / MEO / LEO) and IoT Networks (LoRaWAN, Sigfox) • Providers include NBN, Telstra, Optus, TPG, Bendigo Telco
Retail Service Provider	<ul style="list-style-type: none"> • Provide Internet Services to End Customers either through a Wholesale provision (i.e. NBN) or full end to end service provision (i.e. Telstra 4G) • Providers include Telstra, Optus, TPG, Bendigo Telco

Potential Access Network Uplift Matrix



IMMEDIATE REQUEST

Realise 100 Gig Bendigo potential immediately

Create the cheapest and fastest internet services – 100 Gig Bendigo including to entire extents of Bendigo City Centre and into the Main Regional Corridor point of interconnect \$4.3M (Capex and Opex) one off

The Challenge: Key areas in our region do not have access to connectivity that is fit for current purpose and easily scalable for the future.

The Opportunity: Up to \$800 million in benefits through increased economic activity and employment for the region.

Success Criteria: New digital infrastructure deployed (accelerated investment) to reduce barriers to entry and increase ease of online access to business, education and health services will increase economic and employment outcomes for the region over the coming decades.

REQUEST

Project	Purpose	Scope	FY2022 CAPEX Funding sought	2022/23-2028/29 Subsequent OPEX Funding required
Extend affordable 100 Gigabit access	<ul style="list-style-type: none"> The entire extents of the Bendigo CBD to have access to 100 Gigabit connectivity through an open access competitor neutral duct network. 	<ul style="list-style-type: none"> Design, build, own and operate a new duct network to accommodate the extended reach 100 Gigabit connectivity services via at least one service provider 	3.6M	0.7M
Extend Regional Fibre Backhaul Networks	<ul style="list-style-type: none"> Extend high capacity open access fibre backhaul and interconnect from Bendigo to Echuca, Castlemaine to Maryborough and potentially other areas 	<ul style="list-style-type: none"> Engage a partner to design, build, own and operate an extended fibre backhaul network. 	27.5M	4.6M
Accelerate 5G rollout for Key Centres	Accelerate the deployment of full capability 5G in Bendigo, Echuca, Castlemaine and Maryborough through a network of new Smartpoles designed to host 5G Network equipment	Design, build, own and operate a network of new Smartpoles at bus stop locations in the urban extents of Bendigo, Echuca, Castlemaine and Maryborough	13.9M	2.4M
Whole of Region 3G to 4G Uplift	<ul style="list-style-type: none"> Accelerate the upgrade 3G network coverage to 4G in the rural and remote parts of the region. Consideration of utilising a 'neutral host' approach to passive tower, backhaul and active radio network sharing could be undertaken with at least two mobile network operators 	<ul style="list-style-type: none"> Provide co-investment to a partner to design, build, own and operate a neutral host 4G mobile network. 	50.0M	8.3M
Fixed Wireless & Satellite upgrade to FttP	<ul style="list-style-type: none"> Upgrade the current NBN Fixed Wireless and Satellite towns of Boort, Malmsbury and Newstead to Fibre to the Premise. 	<ul style="list-style-type: none"> Provide co-investment to NBN to upgrade the towns to fibre to the premise 	7.7M	3.9M

3 Quantitative and Qualitative Benefits

The table below summarises how each benefit was quantified including:

- A list of the associated initiatives that deliver the benefit
- A description of how the benefit is derived from the initiatives; and,
- The parameters for how each benefit is measured

3.1 Quantitative Benefits



Benefit	Option 1 \$(m)	Option 2 \$(m)	Option 3 \$(m)
Economic Uplift	213.0 ¹	266.3	319.5
Employment Increase	511.4 ^{2,3}	547.9	584.6

SKILLING			
Benefit	Option 1 \$(m)	Option 2 \$(m)	Option 3 \$(m)
Economic Uplift	80.0 ⁴	140.0	200.0
Employment Increase	111.2 ^{5,6}	116.8	122.3

DIGITAL HUBS			
Benefit	Option 1 \$(m)	Option 2 \$(m)	Option 3 \$(m)
Economic Uplift	132.1 ⁷	165.2	198.2
Employment Increase	111.2 ^{8,9}	116.8	122.3

CONNECTIVITY			
Benefit	Option 1 \$(m)	Option 2 \$(m)	Option 3 \$(m)
Economic Uplift	135.9 ¹⁰	237.9 ¹¹	345.0
Consumer Surplus	Included above	Included above	Included above

1. Extrapolated from <https://www.telstra.com.au/business-enterprise/news-research/research/embracing-the-digital-economy>
2. Extrapolated from <https://www.acs.org.au/insightsandpublications/reports-publications/technology-impacts-on-the-australian-workforce.html>
3. <https://onlinelibrary.wiley.com/doi/abs/10.1111/1467-8462.12384>
4. Extrapolated from <https://www.mckinsey.com/featured-insights/asia-pacific/digital-australia-seizing-opportunity-from-the-fourth-industrial-revolution>
5. Extrapolated from <https://www2.deloitte.com/au/en/pages/economics/articles/productivity-is-not-an-accident.html>
6. <https://onlinelibrary.wiley.com/doi/abs/10.1111/1467-8462.12384>
7. Extrapolated from <https://www2.deloitte.com/au/en/pages/economics/articles/productivity-is-not-an-accident.html>
8. Extrapolated from <https://www2.deloitte.com/au/en/pages/economics/articles/productivity-is-not-an-accident.html>
9. <https://onlinelibrary.wiley.com/doi/abs/10.1111/1467-8462.12384>
10. Extrapolated from 10 Gig Adelaide - Analysis from the South Australian Centre for Economic Studies
11. Extrapolated from <https://www.pwc.com/gx/en/industries/technology/publications/economic-impact-5g.html>

3.2 Qualitative Benefits

Qualitative measure	Initiative	How is the benefit derived
Increased economic development	All	<p>Increased economic growth is underpinned by increased investment and employment opportunities created through digital ecosystem, as well as from increased tourism (due to better internet connectivity and technology solutions like smart apps and VR).</p> <p>Mobile-based services can contribute to productivity and economic growth. 4G, 5G and IoT has the potential to improve productivity through cost savings across all parts of the economy. In one study, it was found that national rollout of 5G could result in additional per capita GDP from anywhere between \$1,900 and \$8,400.101¹</p> <p>Investment attraction will be increased through expansion of local businesses and new businesses creation underpinned by improved internet connectivity, open data, new tech solutions, smart transport and start up ecosystem.</p> <p>Better internet connectivity can lead to a growth of ICT in the form of cloud computing and creation of new software.</p>
Improved employment opportunities	All	<p>Smart technologies can play a role in making job market more efficient, supporting local business growth, and developing digital skills that make people more employable. First, digital technologies can boost job creation in knowledge-centric and data-driven industries. Second, online digital skills programs will enhance people's career opportunities. Third, Innovation hubs located close to employees' homes can stimulate business growth and provide increased job opportunities</p> <p>For example, the increased use of machine-to-machine technologies (which enable networked devices to exchange information and perform actions without human guidance) and ecommerce can lead to more efficient use of capital and labour.</p>
Improved research and development	All	<p>Improved connectivity leading to open access to data is a prerequisite to progress for both research and development of new products and services.</p> <p>Further, internet connectivity and VR can remove the physical location constraint for experimental practices and facilitate the sharing of resources between larger numbers of students and researchers.</p>

1. Bureau of Communications and Arts Research, Department of Communications and the Arts, Australian Government, Impacts of 5G on productivity and economic growth, Working paper (April 2018)



