Building a wireless and 5G future

Contents

1. Executive summary

Enabling a wireless and 5G future offers exciting opportunities for Australian businesses. To help organisations prepare and understand the many benefits 5G will provide their business, this whitepaper explores results of a survey conducted in June 2020 with GlobalData, where 150 business and IT decision makers across Australia were interviewed.

Amid the rapid changes brought about by COVID-19, the research findings show how Australian businesses are looking to take advantage of the speed, reliability and scalability of 5G.

5G will enable more than just speed. It is set to change the way businesses operate and will bring a level of connectivity and opportunities never before seen. It's time to make 5G part of your business plan.

Key takeaways of this whitepaper

Ninety-three per cent of Australian businesses reported they have changed IT priorities either significantly, or dramatically due to COVID-19.
Nearly two-thirds (65 per cent) of IT and business leaders surveyed believe COVID-19 has changed their organisation forever.[1]
Sixty-eight per cent of Australian businesses surveyed will look at 5G to support field workers within three years.
One million connected devices will be expected to be supported per square kilometer with 5G.[2]
By June 2021, 75 per cent of the Australian population is expected to be covered by the Telstra 5G footprint.[3]
Sixty-eight per cent of Australian employers allow their staff to work remotely.[4]
Two-thirds (67 per cent) of Australian businesses surveyed will look to connect their IoT devices to 5G within three years.
Eighty-two per cent of Australian business are monitoring, considering or exploring 5G.
Forty-five per cent of businesses surveyed expect their budget for wireless services to increase over the next 2 years.

[1] Telstra (2020). Business Continuity, Flexible Working and Adaptive Infrastructure: Five Actions for When the Economy Reopens Following COVID-19 study.

[2] Cradlepoint (2020). Pathway to 5G. Available at: https://resources.cradlepoint.com/i/1188184-the-pathway-to-5g/7.

[3] As announced by Telstra in August 2020.

[4] Indeed (2019). 68% of Australian Employers Allow Remote Working, But Attitudes Are Divided. January 12, 2019. Available at: http://blog.au.indeed.com/2019/01/29/report-68-australian-employers-allow-remote-working-attitudes-divided/.

2. Australia's current business perspective

Australian businesses are great first movers with the adoption of new technology such as cloud computing, mobility and tools to aid remote working.

According to 2019 research by Indeed, a global online job advertisement portal, more than two-thirds (68 per cent) of Australian employers allow their staff to work remotely.[5] But 2020 changed everything with a sudden shift to the world's largest work from home experiment when businesses and employees had to adapt to dramatic changes.

On one hand, the ongoing pandemic has slowed exports, disrupted global supply chains, all but stopped tourism, and rattled domestic consumption of goods and services. On the other, COVID-19 forced the issue of mobile and remote working. Specifically, in the first half of 2020, IT investments have become more strategic for many businesses and the way to adapt to the 'new normal' as global economies reopen for business.[6]

As digital transformation accelerates, projects are becoming more focused, impactful and business-critical. Ninety-three per cent of businesses reported they have changed their IT priorities incrementally, either significantly, or dramatically due to COVID-19. Only 2 per cent of organisations report there have been no changes to IT budgets and spending.[7]

Nearly two-thirds of IT and business leaders believe COVID-19 has changed their organisation forever.[8] The sentiment echoed across APAC, Europe and the US markets. Nearly 80 per cent of businesses identified they have some employees who cannot work from home due to IT limitations.[9]

Within the global context, mobility is a foundational technology for many different use cases that will support the future of work. Recently, GlobalData surveyed 4,000 organisations to understand the impact of COVID-19 on IT spending and budget re-allocations. While the biggest priorities within mobile spending are security and application development, the survey uncovered that mobile technologies, such as 5G, are an important platform for enabling many other high priority investments, such as video conferencing, team collaboration and corporate networking.[10]

[5] Indeed (2019). 68% of Australian Employers Allow Remote Working, But Attitudes Are Divided. January 12, 2019. Available at: http://blog.au.indeed.com/2019/01/29/report-68-australian-employers-allow-remote-working-attitudes-divided/.

[6] Telstra (2020). Business Continuity, Flexible Working and Adaptive Infrastructure: Five Actions for When the Economy Reopens Following COVID-19 study.

[7] Ibid.

[8] Ibid.

[9] Ibid.

[10] GlobalData (2020). Research conducted.

5G – the next generation of mobile technology rolling out in Australia – offers a range of capabilities that help drive enterprise transformation. Research from technology vendor Cradlepoint states 5G is expected to support up to 1 million connected devices per 1 square kilometer, compared to around 2,000 connected devices per 0.38 square miles with 4G.[11] Together with mobile edge computing and network slicing, 5G will further support enterprise customers to achieve operational efficiency. This mobile technology will go beyond just connecting employees' smart devices (currently enabled by 4G), bringing with it a new suite of use cases to better support an organisations' needs.

As a new technology, architecture and design, 5G changes everything. Wireless technology is transforming the workplace by extending the corporate network to employees' remote work locations (home or in the field), connecting 'things' (sensors and real-time IoT applications) and enabling IT infrastructure to move to the cloud (including branch offices) at a greater scale and with enhanced security.

The 5G ecosystem – from telecom operators to many technology vendors and partner carriers – is gathering pace and pulling together to deliver innovative, often industry-specific solutions, to the enterprise. All sectors, including public health, emergency services, government, financial services, retail, transportation and logistics are all waiting to benefit from 5G applications – from remote monitoring to asset management.

As organisations prepare for 5G in the coming year (by June 2021, 75 per cent of the Australian population is expected to be covered by the Telstra 5G footprint[12]), they can start to think ahead about how the technology can transform their business. From smart manufacturing to infrastructure-free branch offices, efficiencies will be enhanced and a more agile operating model will continue to become crucial for businesses. To thrive in a fluid, fast-changing environment, 5G is the future of a world forever changed by COVID-19. Forward-looking organisations have started to work with technology partners to explore the different possibilities of 5G now and are exploring/undertaking trials/proof-of-concepts, to better enable them to take advantage of the technology when it becomes available.

[11] Cradlepoint (2020). Pathway to 5G. Available at: https://resources.cradlepoint.com/i/1188184-the-pathway-to-5g/7.

[12] As announced by Telstra in August 2020.

3. Business agility with wireless solutions

The future for business is digital and for years organisations have been transforming to prepare for both digital disruption, and the new opportunities digitisation brings.

Amid the pandemic and supply chain disruption due to geopolitical tensions, organisations now have another reason to be agile – business continuity. Organisations are increasingly starting to see the benefits of doing business online, finding ways to operate even when offices are closed or social distancing is in force. And with remote working here to stay, the workplace has forever changed and will become even more mobile going forward. Businesses are accelerating the migration of IT to the cloud and tapping into data analytics and AI to improve business continuity and processes.

However, as companies speed up their digital transformation, there is a realisation that the corporate network also needs to keep pace with the changes to network traffic flow and support new workloads.

Our recent survey found 39 per cent of organisations with more than 200 full time employees expected an increase in annual spend on network services due to COVID-19. This rose to 74 per cent among small and medium-sized businesses with 20 to 199 full-time employees. This highlights growing awareness of the importance of the network to support business applications and new ways of working.

The good news is this exponential rise in network traffic does not need to fall on a company's shoulders. Employees are generating more traffic outside the formal office environment and workloads are running across public clouds and on-premise IT. With more corporate traffic traversing the internet, wireless connectivity can provide the flexibility and agility needed to ensure business operations remain adaptive. This chapter will explore the increasing importance of wireless connectivity and some key use cases.

> "Bandwidth is the immediate benefit of 5G; especially for workforce in the field
>
> Australian manufacturer, distributor[13]

Use case connectivity categories

Most customer use cases can be categorised into three overarching connectivity types. Those are:

1. **Primary Wireless** – whereby a network is connected to 5G/4G as a primary method of connection to the internet or WAN. This may or may not have a secondary means of network access
2. **Failover** – whereby the primary network is fixed and is configured to automatically fail over to wireless should there be network interruptions
3. **Hybrid** – where customers may utilise a combination of wireless and fixed simultaneously, effectively binding these two networks together therefore providing additional bandwidth and speed for network access.

[13] Telstra and GlobalData Enterprise Wireless 2020 survey, in depth customer interview quote.

Use case 1: branch connectivity

Most businesses use a mix of public Internet and private networks (e.g. MPLS and Ethernet) for their wide area network (WAN). However, in our recent survey 43 per cent of respondents indicated their organisation had already implemented wireless for failover and redundancy.[14] Failover is important for mission-critical applications, such as point-of-sale solutions, video conferencing, ERP applications, SaaS and increasingly IoT environments, that require high availability, throughput and low latency.

Outside of metropolitan areas, fixed access may not always be available for branch offices or take time to deploy and involve a contractual commitment. Wireless access can deliver a more flexible option for businesses that need more agile solutions, such as connectivity to a temporary location or pop-up site. With the home office becoming the 'new branch', both highly distributed and heterogeneous, 5G is an ideal solution for addressing the likely permanence of home working.

With 5G offering great speeds and reliability, wireless connectivity will increasingly be used as a primary link for branch sites. In our recent survey, 41 per cent of businesses identified that they already have sites that rely on wireless as their primary link; and 46 per cent of businesses identified that they are considering this option over the next three years.

With the changing work environment and the lower reliance on physical offices and retail outlets, organisations should look for solutions that give them the most flexibility.

Use case 2: pop-up connectivity

Immediate connectivity is especially important for temporary sites, including construction sites, pop-up stores and branch offices. 5G wireless connectivity allows for fast deployment, eliminating the need to wait for the provisioning needed with fixed connectivity. Wireless connectivity can also be quickly redeployed to another location if required.

This flexibility makes wireless a more attractive option for sites that will have a known short duration. As organisations set up new sites/branch offices or relocate existing ones, wireless connectivity will increasingly be used to ensure fast deployment, and wireless makes an ideal backup solution or a primary link.

Use case 3: field workers

Wireless connectivity has enabled field workers to connect to business applications and access data in more locations than ever before. In our recent survey, 68 per cent respondents identified that they will look at 5G to support field workers within three years.

In remote locations, vehicles and open spaces, a mobile router enables field teams to have the tools to perform tasks more effectively (e.g. from a site survey to location tracking). For example, in emergency services, operational teams on the ground need to communicate with the command centre, and the ability to send images and videos can also help to provide a better response to emergency situations. Similar applications can be found for transportation, energy and environmental service providers.

The mobile network is also used to connect IoT and smart cities applications and two-thirds (67 per cent) will look to connect 5G to IoT services within three years, according results of our recent study.

[14] Telstra and GlobalData Enterprise Wireless 2020 survey, June 2020.

There are many ways wireless applications can provide data and insight for organisations to make better decisions, automate processes and minimise downtime through predictive maintenance.

There are different options for connecting IoT, and with 5G organisations will be able to address applications that require higher bandwidth and low latency.

Use case 4: remote working

For many years organisations have been adopting new ways of working, including enabling work from home by providing mobile dongles and covering internet costs to facilitate this transition.

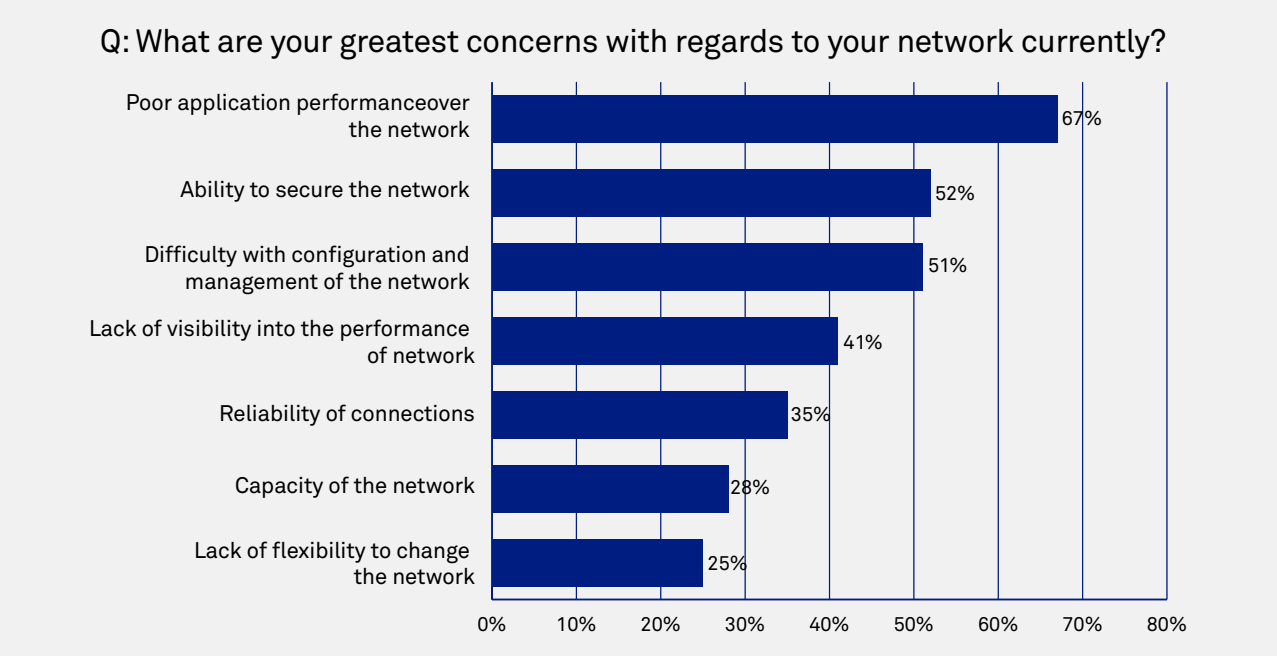
This work arrangement has led to an increased usage of video conferencing for meetings, and uptake of other collaboration tools to enable remote teams to work more effectively.

In addition to access, there is also a need for employees to work with mission-critical applications and sensitive data from their home offices. This raises challenges around security and compliance, as well as application performance.

Organisations have traditionally deployed VPN solutions to address known security risks, but VPNs might not overcome challenges with application performance or user experience, particularly if the VPN becomes overloaded with authentication requests. A combination of wireless and selected fixed technology types can overcome access, security and performance challenges.

By combining wireless and SD-WAN, there are solutions that can provide additional layers of security whilst delivering the performance and mobility that employees need to perform their job.

As businesses rely more on IT and applications for their daily operations, the ability of the network to deliver the right application performance is now a management objective. Based on our recent survey, poor application performance was identified as the greatest concern for most (67 per cent) respondents.



n=150; Telstra and GlobalData Enterprise Wireless 2020 Survey, June 2020.

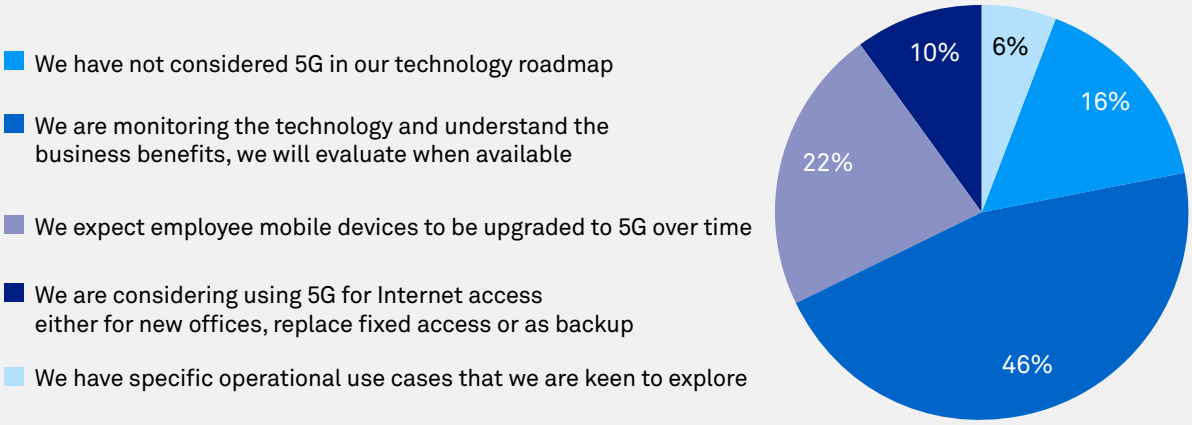
4. 5G will further transform the workplace

With new capabilities brought about by 5G, organisations that are transforming themselves to become a 'digital enterprise', will ultimately also become a 'wireless enterprise'.

However, 5G is still relatively new and most enterprises are not fully aware of its power and potential.

In our recent survey, 82 per cent of business identified that they are monitoring, considering and/or exploring 5G, with six per cent identifying they are ready to trial specific operational use cases.

Q. What level of readiness for 5G does your organisation have?

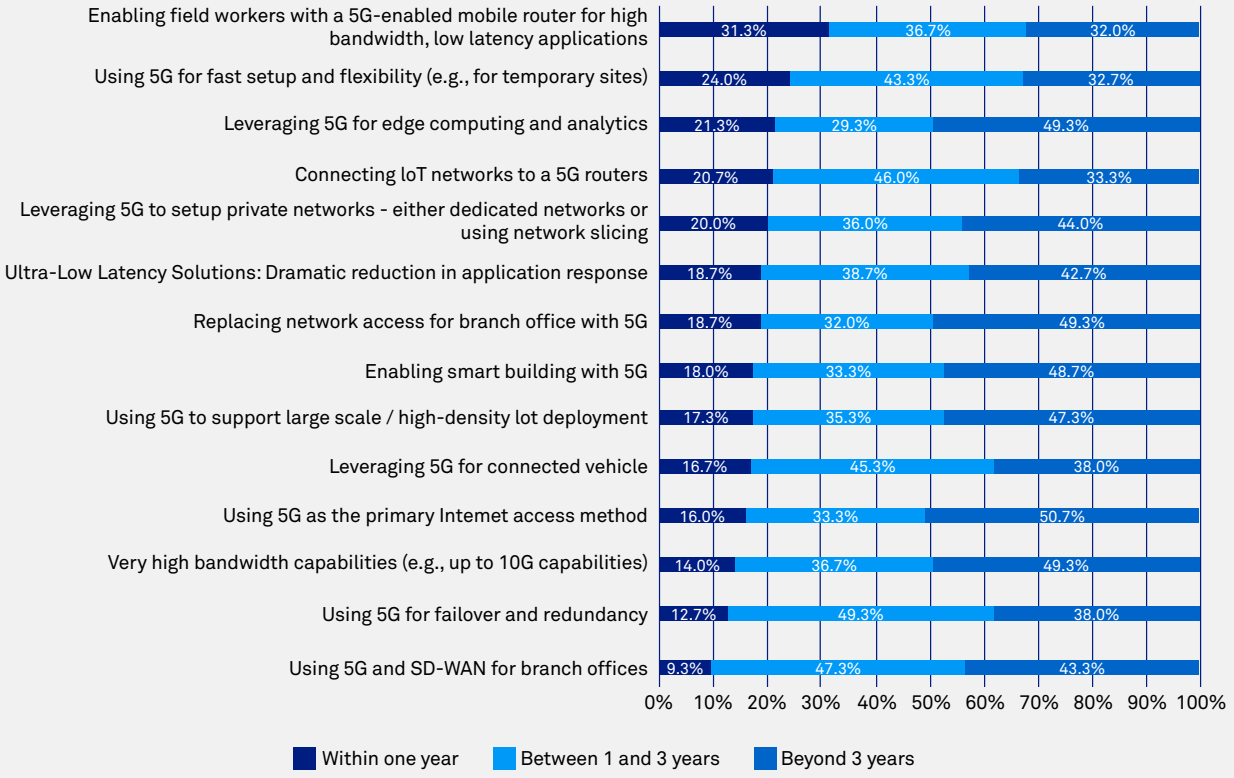


n=100 (for enterprises with 200 FTE & above); Telstra and GlobalData Enterprise Wireless 2020 Survey, June 2020.

Most organisations identify the top three use cases for 5G over the next three years as: mobile router for field workers, fast setup and flexibility, and connecting IoT networks. These important use cases are already supported by 4G, which has delivered faster speed over time and, according to Opensignal, the average download speed in Australia (January 2020 to April 2020) was 44 Mbps.[16] This average speed will be further boosted as mobile operators upgrade their networks to 5G.

> “We are open to all potential 5G use cases
>
> Australian transportation and logistics company[15]

Q. With the available of 5G, would you consider the use of 5G connectivity for the following use cases in the short, medium and longer term?



n=150; Telstra and GlobalData Enterprise Wireless 2020 survey, June 2020.

[15] Telstra and GlobalData Enterprise Wireless 2020 survey: In depth customer interview quote.

[16] Opensignal (2020). 5G download speed is now faster than Wi-Fi in seven leading 5G countries, May 2020. Available at: www.opensignal.com/2020/05/06/5g-download-speed-is-now-faster-than-wifi-in-seven-leading-5g-countries.

5G is actually a completely new architecture – one that is virtualised to the core, distributed, cloud-native and increasingly bringing in open standards and APIs.

The new architecture of 5G makes it possible to introduce new services much faster and for third-party developers to write their own applications. There are also new possibilities 5G can deliver as the ecosystem becomes more developed. This next chapter will consider some of these use cases.

Use case 5: fixed line replacement

Compared with previous generations, 5G is a more feasible fixed line access replacement, with the speed and reliability it offers. According to Opensignal measurement, 5G is showing faster speeds than Wi-Fi in countries that have leading 5G deployments.[17] In Australia, Opensignal measured the average 5G download speed at 164Mbps (January 2020 to April 2020).[18] In an updated report by Opensignal in August 2020, it notes that operators in Australia had improved their download speeds, with Telstra achieving 232Mbps on average.[19]

With the use of massive MIMO antenna technology, where many more than two or four antennas are used, 5G signals will be more targeted at end-user devices, thus enabling more reliable connectivity and speed stability. With these properties, 5G can be a primary connection, not just a backup.

[17] Opensignal (2020). 5G download speed is now faster than Wi-Fi in seven leading 5G countries, May 2020. Available at: www.opensignal.com/2020/05/06/5g-download-speed-is-now-faster-than-wifi-in-seven-leading-5g-countries.

[18] Ibid.

[19] Opensignal (2020). Australia 5G User Experience Report, August 2020. Available at: www.opensignal.com/reports/2020/08/australia/mobile-network-experience-5g.

Use case 6: ultra-low latency applications

Low latency is a key attribute of 5G, and by bringing latency down (potentially below 5 milliseconds) will enable exciting real-time, mission-critical applications, such as remote monitoring and control of robotics, factory automation, autonomous vehicles and even surgery.

> 5G's ultra-low latency means the connectivity will not just be offered as a standalone service, but will become part of an industry-specific solution that addresses customers' pain points.

Many low latency solutions and use cases will be IoT-related, accelerating the convergence of IT (information technology) and OT (operational technology) to achieve greater productivity and operational efficiency.

Use case 7: massive machine type communications (mMTC)

Using current cellular technologies for massive IoT deployments has scalability limitations. While 4G supports IoT devices in the thousands from a single cell site, which is sufficient for some use cases, 5G will scale to support millions of IoT devices in the same range.

This level of scalability is crucial for IoT networks to support a high density of devices. Such use cases include digital smart cities, smart buildings and deployments to machine parts for predictive maintenance. Massive machine type communications, or mMTC, is well suited to asset monitoring and predictive maintenance due to the scale of the number of sensors required.

By connecting physical assets like property, plant and equipment to a 5G network via sensors, video and other IoT hardware, businesses can take a more proactive approach to asset maintenance. Real time data collection and analysis can identify equipment faults, which can be rectified before they cause downtime.

5G is set to minimise equipment failure and maximise its utilisation.

Use case 8: mobile edge computing

Edge computing refers to the deployment and use of computer processing, data storage and analytics capabilities close to the places where data is collected, or where digital content and applications are consumed.

In a similar fashion, mobile edge computing (MEC) can de-centralise cloud and data centres, shifting processing capabilities to mobile edge nodes. Hyperscaler clouds (such as AWS, Microsoft Azure and Google Cloud) are working with mobile network operators around the world to develop mobile edge computing capabilities.

MEC will extend high-performance storage, compute and network resources to the physical location of the data source; thereby lowering the cost of data transport, reducing latency and improving the security and locality of solutions. Moreover, by extending network functions to the mobile edge, it will become possible for organisations to use 5G to operate infrastructure-free branch sites. This will further enhance operational agility by allowing IT and network resources to be programmable and configured remotely.

Use case 9: 5G network slicing

5G network slicing enables mobile network operators to create multiple virtual networks over a common physical infrastructure.

A ‘slice’ can be configured (e.g. bandwidth, security and policy) to deliver the performance required for specific use cases. Network slicing can also deliver a virtual private mobile network for an enterprise customer that requires performance and security, but not a physical dedicated network. This can be applied to industry-specific scenarios, such as a smart factory in the manufacturing industry.

Since the network is allocating the right level of resources for each application, network slicing also offers some unique capabilities. Instead of traditional static network services, organisations can exploit different network resources for different applications based on metrics such as bandwidth, latency, security, geography coverage, duration and reliability.

For example, real-time applications can be afforded the most stringent quality of service (QoS) instead of regular, unpredictable network performance dependent on traffic volumes and network congestion. Traffic can also be routed across different networks, or separate paths, which can be important considerations for areas such as load balancing or resiliency.

5G network slicing can offer an additional layer of security since there is isolation between network slices.

In addition to improved performance, each network slice can have customised security protection by having the right firewall configurations and access policies.

5. Future outlook and recommendations

As Australia becomes more digital, automated and connected, business transformation will continue to happen everywhere, from customer experience, to the home office. Successful organisations of the future will look to wireless connectivity for agility and business continuity utilising primary, backup or hybrid wireless solutions.

With new possibilities enabled by 5G, businesses transforming themselves to become a 'digital enterprise', will ultimately also become a 'wireless enterprise'.

With the rapid advancement of wireless technology, organisations should consider the following:

Consider multiple access solutions.

Access should not be all or nothing. Consider adopting multi-service networks, and mixing and matching solutions, including fixed and wireless internet services. The focus should be on delivering application performance and boosting employee productivity. Adding wireless as a co-primary or secondary link can help to achieve higher reliability and increase bandwidth.

Wireless delivers flexibility and speed.

Wireless access provides the flexibility and fast deployment that is advantageous for temporary site locations, including pop-up stores or temporary branch offices. Wireless should also be considered for sites which have urgent communications needs.

Plan for a 5G future.

5G development is gaining pace and will become widely available soon. 5G should not just be seen as an upgrade that comes with a new generation of smartphones, but rather an enabler of a wide variety of industry-specific solutions and use cases. By driving the convergence of IT and OT the attributes and capabilities of 5G should be part of any digital transformation plan. For example, as workloads are moved to the cloud, you can plan the move of latency sensitive workloads to 5G-enabled mobile edge computing platforms, instead of the nearest region operated by a cloud provider. 5G should not be viewed as a standalone technology, but as an enabler for other innovations in cloud, IoT, applications and many use cases driven by its high availability networks and low latency. 5G supported hardware can be deployed now in preparation for coverage availability allowing for seamless upgrades and provisioning.

Consider applications and managed services.

Networking solution providers now offer cloud-based management tools that can enable greater visibility and simplicity for network solution management. Businesses have different management options, including do-it-yourself, co-management (partly managed by a third-party service provider) and fully managed services. The management option should be chosen based on the complexity of the network and what applications the wireless solution is supporting. As a standalone solution for a specific use case, an IT department can choose to manage the solution in-house and get the value of specialist advice and training.

A managed service should consist of consulting, design, architecture, implementation, project management, ongoing support and reporting insights. A fully managed service can be advantageous if organisations do not see network management as a core capability within their business or typically run operations as an outsourced model, providing management and support across different networking technologies.

The service provider's roadmap is crucial, especially considering the rapid development of 5G and software-defined networking technologies.

Mature customers are considering how 5G can be utilised as a real alternative to fixed connections, by understanding the most impactful use cases and determining the benefits received due to challenging legacy business processes and structure.

With careful customer design and planning, 5G will present new opportunities for Australian businesses. Providing rapid deployment, better flexibility and faster speeds allowing for enhanced business operations.