

Fibre-Based Non-Premises Connectivity Enables Success in High Bandwidth IoT Use Cases



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Non-Premise Access — a Growth Market for Connectivity Providers

Non-premise access represents an important growth area for connectivity providers, especially fibre optic connectivity providers. Use cases are emerging in public infrastructure, transportation, smart city and masterplan community services, commercial building management (professional services), healthcare, and utilities. Public infrastructure owners are converting traffic lights and streetlights into smart infrastructure through the provision of fibre optic bandwidth, enabling multiple sensors and IP cameras. These tech buyers, such as the state governments and regional jurisdictions, recognise the potential and utility of Internet of Things (IoT) data collection and are investigating the best ways to capitalise on IoT. Monitoring of remote assets such as highways, waterways, coastal areas, tunnels, and bridges can be automated cost effectively with advanced fibre optic connectivity. This provides reliable, scalable bandwidth to enable video analytics. Suppliers of subsystems to commercial property are

AT A GLANCE

■ Key Stats

IDC estimates that in 2022 there were 204,000 non-premise connections in Australia with 210 Gbps of traffic. IDC forecasts non-premise connections to grow 5x (1 million) by 2030, a CAGR of 22%. Traffic will grow 21x to 4,411 Gbps, a CAGR of 46%.

■ What's Important

This market represents a significant connection and revenue growth opportunity for retail service providers (RSPs) that can provide compelling non-premise connection propositions. Tech buyers can access low latency, high bandwidth fibre-based Internet of Things (IoT) connectivity in outdoor locations.

■ Key Takeaways

In partnerships with RSPs, tech buyers can realise the benefits of non-premise-based IoT solutions that require high bandwidth for video analytics, edge compute, and comprehensive data and analytics, particularly for tech buyers in the government, transport, and utilities sectors; and property developers. Fibre optic non-premise connectivity can deliver scalable bandwidth and low latency.

investigating where it makes sense to upgrade their solutions with bundled fibre connectivity to bypass the property’s LAN infrastructure to have more control over cybersecurity, quality of service, and bandwidth.

Costs involved in constructing fibre optic non-premise connectivity have been an impediment to tech buyers and this has likely discouraged CIOs from investing more aggressively in IoT for their infrastructure. Recognising this, providers of fibre optic non-premises connectivity are starting to implement product offerings that balance pricing versus bandwidth. In some cases, depending on how remote the location is, fibre can be combined with either satellite or cellular connectivity in various hybrid formats.

Non-Premise Access — Fixed Connections with no Address

IDC defines IoT as a network of uniquely identifiable endpoints (or “things”) that autonomously connect bidirectionally using IP connectivity. IDC identifies the IoT ecosystem as containing a complex mix of

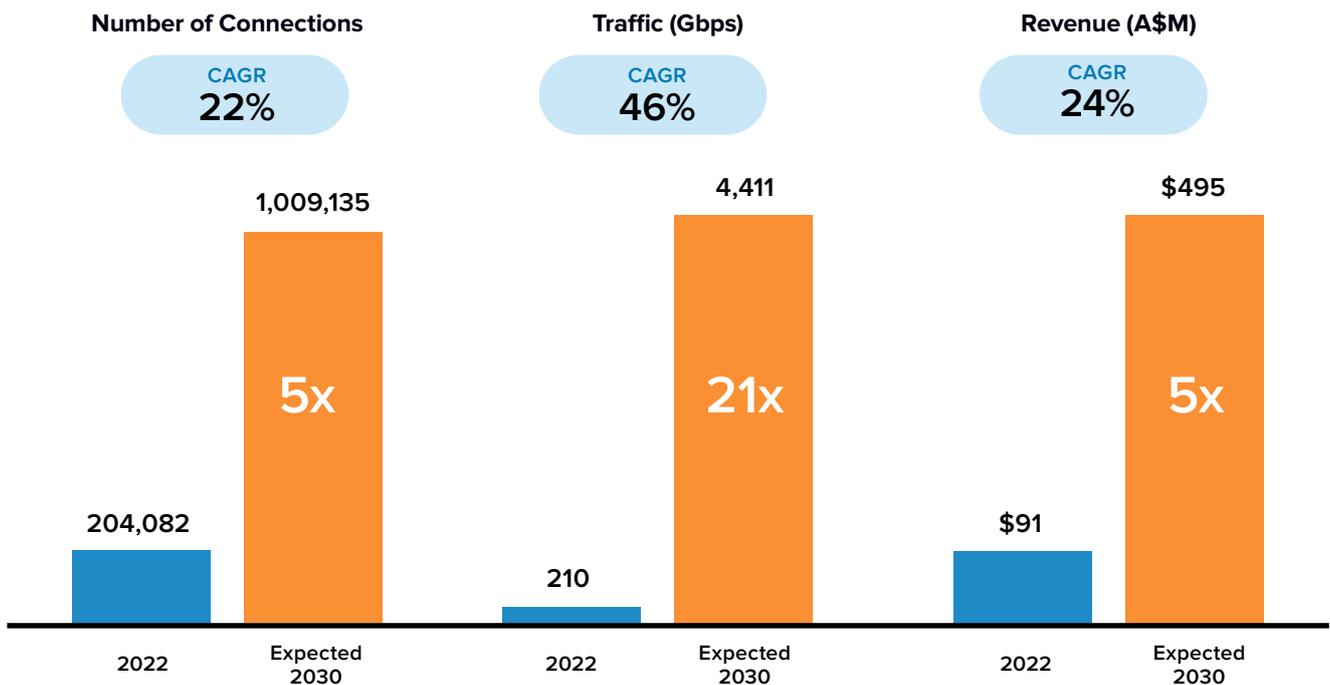
technologies and services including, but not limited to, modules/devices, connectivity, IoT platforms, storage, servers, security, analytics, and IT services.

Fully autonomous endpoint devices (i.e., those operating without human interaction) are included in IDC’s definition of connected IoT devices. However, IDC excludes from its definition of connected IoT devices traditional personal computers, laptops, mobile phones, and tablets used as endpoints.

Non-premise connections are IoT connections that are not billed to a specific residential or office address and are generally enabled within public and utilities infrastructure and enterprise private networking. Access technologies that enable these connections include fixed fibre access, fixed wireless access, cellular access, and satellite access.

Fixed wireless access can be delivered with 3GPP (e.g., 4G LTE, 5G NR) and non-3GPP radio interfaces (such as WiMAX, WiGig) in indoor and outdoor scenarios with connection speeds of 1 Mbps to 100+ Mbps. Satellite access includes low Earth orbit (LEO), medium Earth orbit (MEO), and geosynchronous Earth orbit (GEO) with connection speeds of 50 Kbps to 100+ Mbps.

FIGURE 1
Non-Premise Connections Wholesale Market Opportunity



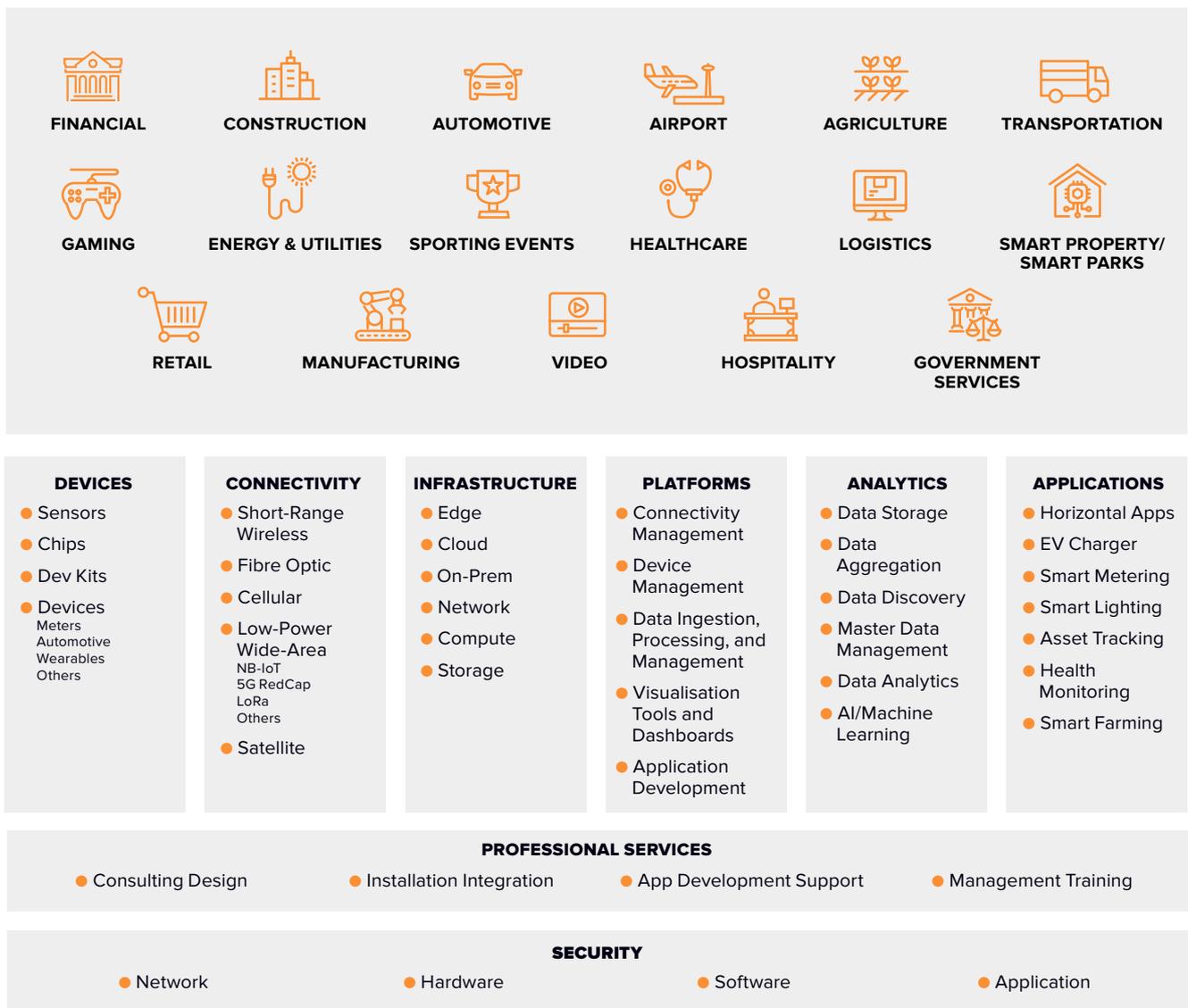
CAGR = Compound Annual Growth Rate from 2022-30 (expected)
Source: IDC, 2023

Connectivity solutions can be categorised into three groups of parameters:

- Peak bandwidth** measured in Mbps. This is the bandwidth offered by the connectivity provider. Fibre optic can offer higher bandwidths over extended periods of time as compared with satellite and other wireless solutions.
- Total data volume** consumed in one month. This is important for the connectivity provider in dimensioning its network infrastructure. To understand this, consider that 1 Mbps continuous transmission for one month generates 328 GB of data.

- Transmission profile** such as a continuous transmission or a ‘bursty’ transmission. Smart meter solutions, for example, only need to transmit small packets of data a few times per day so that the effective bandwidth needed is <50 Kbps. However, a video camera monitoring a critical infrastructure such as a tunnel or bridge would need to have continuous transmission > 5–10 Mbps.

FIGURE 2
Fibre Non-Premise is an Important IoT Access Solution Across Many Industries



Source: IDC, 2023



Industry Trends Driving Growth in the Non-premise Connectivity Market

In terms of market growth, there are many factors that are making fixed non-premise IoT solutions more attractive to tech buyers:

- Bandwidth of fibre connectivity continues to increase while the cost of the electronics continues to decrease, making scalability an important driver.
- Resilience, reliability, and availability in critical infrastructure. The combination of high availability and higher bandwidth means connections requiring higher resiliency may opt for fibre as their primary connectivity option.
- Edge and cloud-based video analytics and other analytics around sensor data including location, vibration, humidity, temperature, LiDAR, and so on are becoming an increasingly important part of the overall operations of infrastructure.
- The need to enhance operational efficiency and to implement automation.
- Increasing interest in reducing costs associated with maintenance and repairs through predictive analytics.
- Increasing data flow means the need for scalable broadband. For example, using an HDR camera as a single endpoint for multiple IoT use cases, and incorporating edge analytics.
- Increasing trend towards deploying more critical applications means tech buyers are more frequently seeking low latency and/or QoS in connectivity.

- Desire for increased security in non-building-based IoT solutions.

Benefits of Non-Premise Fibre Access for Tech Buyers, Retail Service Providers, and Network Providers

Benefits for the tech buyer

- Fibre optic non-premise connectivity provides a new level of data collection and operational control over infrastructure that has not been possible in the past. For critical infrastructure and new developments, fibre optic would be the preferred choice with cellular and/or satellite for additional redundancy. Benefits include scalability, high reliability, and increased security.

Benefits for the RSP

- A key benefit for RSPs is that the ability to extend the reach of the traditional fibre footprint increases their total addressable market for fibre connectivity and enables them to provide connectivity solutions for emerging use cases with robust, scalable, and secure fibre connectivity.

Benefits for the network provider

- For fibre optic providers that have already built premise broadband connectivity in residences and enterprises, non-premise presents an incremental opportunity to capitalise on the existing fibre optic backhaul infrastructure which can be used to transport high-bandwidth (e.g., 1 Gbps or more) aggregated non-premise traffic.

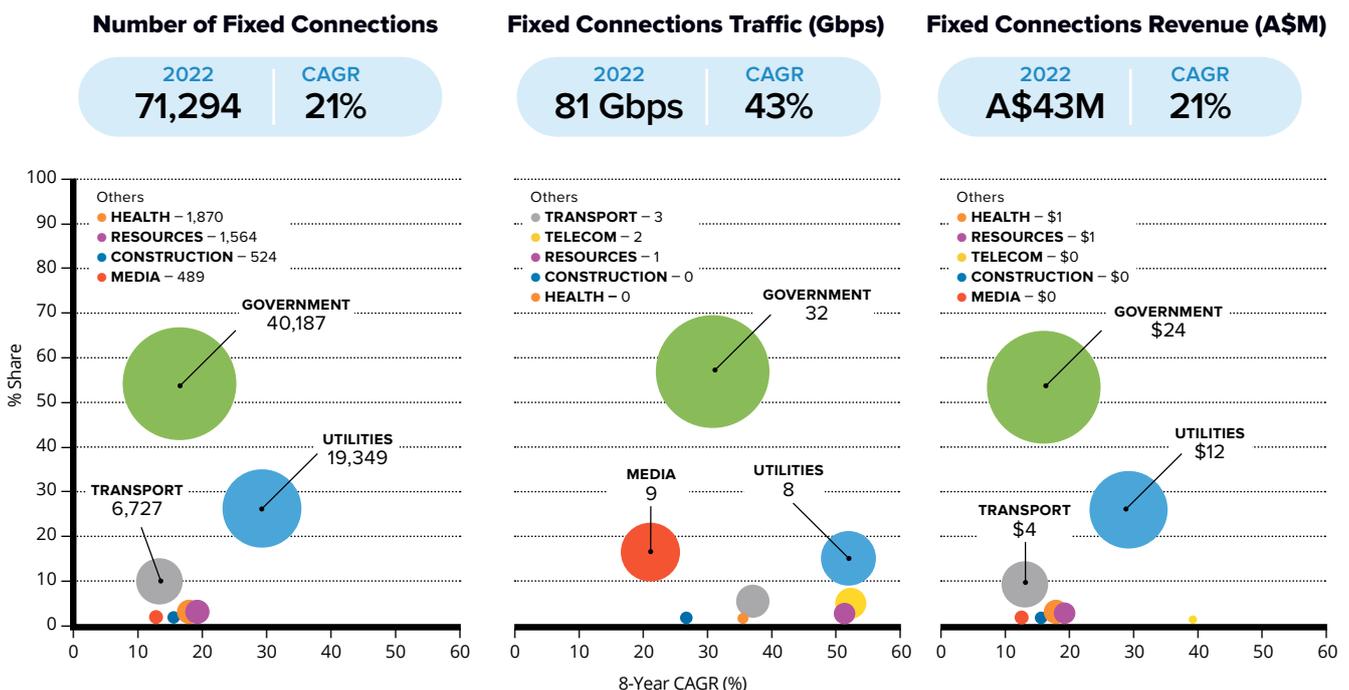
Identifying Priority Use Cases for Non-Premise Connectivity: Government, Utilities, and Transportation

The leading use cases for fibre optic non-premise connectivity can be categorised into the following industry groups:

■ **Government/smart city:** Government encompasses a wide range of infrastructure monitoring use cases, many of which are better served with fixed fibre connectivity due to being critical infrastructure (highways, waterways, tunnels, bridges). IDC believes that over time, more of these use cases will deploy advanced video analytics for automatic detection of ageing infrastructure, obstruction of railway tracks, traffic congestion, accidents, and so forth. Some of the newer use cases that are gaining interest include smart poles that integrate multiple functions, automated car park surveillance, and smart waste management. Infrastructure monitoring and smart city surveillance are the two largest sets of use cases. There are others equally well-suited for non-premise fibre such as vehicle-to-everything (V2X) infrastructure, vehicle traffic monitoring, traffic lights, smart poles, digital signage, and environmental monitoring.

- **Housing developments:** The Australian federal government announced in August 2023 that it will set a new national target to build 1.2 million well-located new homes over the space of five years from July 1, 2024, as part of a new plan agreed to at national cabinet. Whether broadacre or high density developments, these new homes will look to increase supply and attract both buyers and renters to these new developments. Key to these new developments will be the integration of smart city technology, energy efficiency, and public amenity, which will likely require connectivity to support the underlying services. As a further incentive, the New Homes Bonus was announced — A\$3 billion of performance-based funding for the states and territories that achieve more than their Accord targets to undertake reforms to boost housing supply and improve housing affordability. Along with the Housing Support Program, a A\$500 million competitive funding programme for local and state governments to kick-start housing supply.
- **Utilities:** Utilities companies are constantly looking for better ways to monitor their infrastructure and to provide lower-latency control systems. The introduction of fibre access expands the capabilities of the monitoring and increases the reliability of the overall systems. In utilities, electricity distribution

FIGURE 3
Government, Utilities, and Transport are Top Industries for Non-Premise Fixed Connections



CAGR = Compound Annual Growth Rate from 2022-30 (expected)
Source: IDC, 2023

requires high-performance, low-latency (<75 ms) network links to enable phase measurement units (PMU) to function properly in conjunction with phasor data concentrators (PDCs) to provide wide-area visibility. Gas and water pipeline monitoring would usually combine sensors with IP cameras for visual inspection of field assets and protection of critical infrastructure. Satellite backup can also be a requirement in the more remote areas.

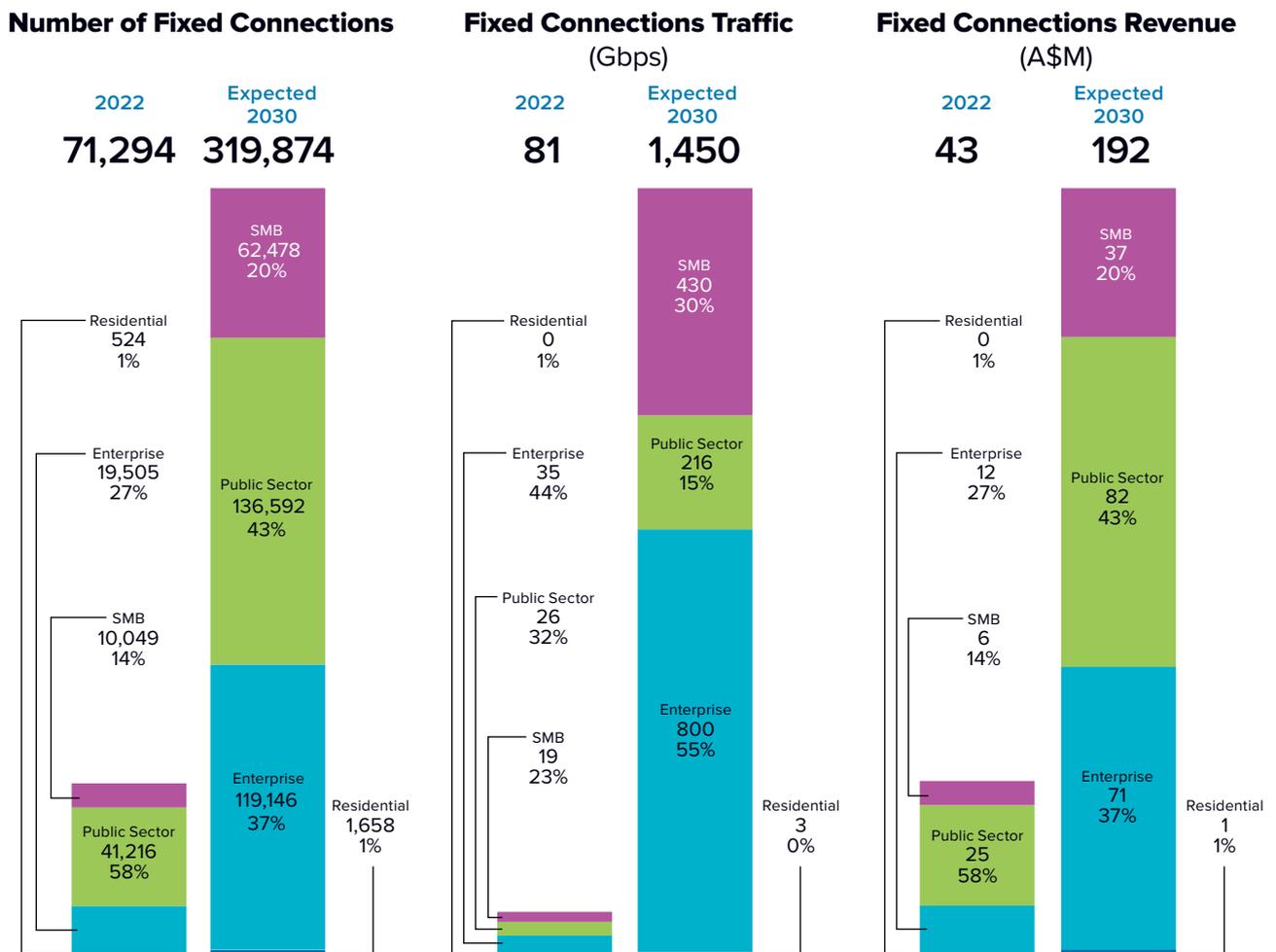
■ **Transportation:** Transportation use cases include train station surveillance, congestion monitoring, smart kiosks, and EV charging. Transportation also includes monitoring of railway tracks and surrounding

areas using fibre optic sensors, balise beacons, vibration sensors, and video monitoring IP cameras. Railways that have underlying optical fibre already installed can provide backhaul for fixed wireless access base stations as well as transport video traffic.

■ **Construction and other industries:** Construction is a short-term opportunity with contracts ranging from 2–5 years, depending on the duration of the construction. Media, retail, transport hubs represent mid- to long-term opportunities but are strategic. All of these will increasingly need more video bandwidth as video analytics penetrates into most, if not all, industries.

FIGURE 4

Enterprise and Public Sector Dominate Non-Premise Fixed Connections Market



► In 2030, 37% of connections will be in infrastructure owned by enterprises.

► The public/government sector will account for 43% of connections in 2030.

► In 2030, 55% of bandwidth will be in the enterprise sector.

► In 2030, the public sector will account for 15% of the bandwidth and this is driven in large part by IP cameras adoption.

► In 2030, 37% of revenue will be from the enterprise sector.

► Public sector will represent 43% of the total revenue.

Note: Percentages might not add up to 100%, due to rounding. Source: IDC, 2023

Considering nbn Smart Places

nbn, the wholesale broadband access network for Australia, has developed a new wholesale product called nbn® Smart Places — a smart connectivity solution for businesses and communities.

As planning and development of smart cities, suburbs, precincts and buildings rapidly increases, nbn recognises businesses and communities want to experience the benefits of smart devices, applications and solutions in outdoor locations. nbn Smart Places is a solution that brings the nbn network to spaces beyond the four walls of homes and businesses.

nbn Smart Places extends the nbn fibre network, a component of the nbn network, to a range of eligible non-premises locations such as traffic lights, CCTV, smart poles, digital billboards, and public Wi-Fi. As a new nbn wholesale product, nbn Smart Places enables the connectivity for IoT and smart infrastructure to eligible non-premises locations.

nbn Smart Places is an ethernet-based Layer 2 fibre product designed to enable wide-scale non-premises connectivity in areas within the nbn fixed line footprint and eligible nbn new development locations, excluding isolated and limited access areas¹.

As shown in Figure 5, nbn Smart Places provides a connectivity solution to eligible non-premises locations, including but not limited to locations where the physical space is too small to house a traditional network termination device (NTD). nbn Smart Places will offer two class types²: Access Virtual Circuit (AVC) Traffic Class 2 (TC2) and AVC Traffic Class 4 (TC4). nbn AVC is the fixed cost of the individual connection to the network. nbn also offers four optional enhanced service-level agreements (SLAs).

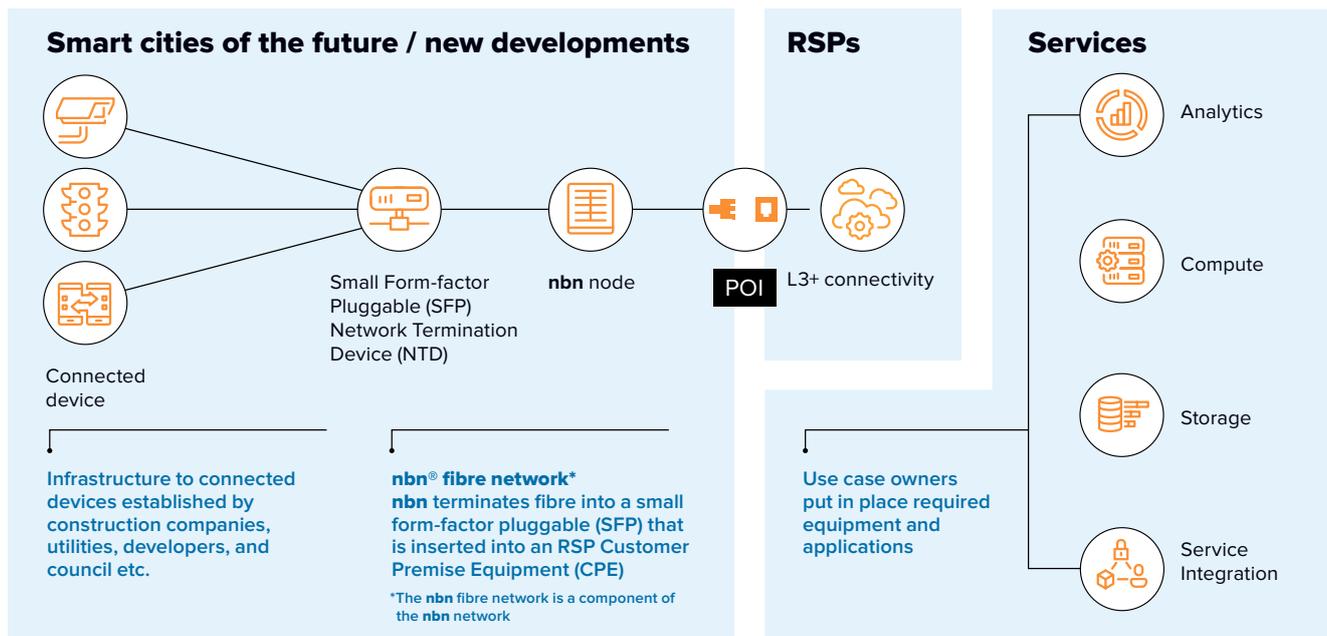
Buyers can connect to nbn Smart Places at eligible locations in the existing nbn Fixed Line Footprint through a simple three step process:

1. Buyers can contact their preferred internet provider to connect to nbn Smart Places,
2. nbn will then construct fibre to the buyers' eligible non-premise location (where required), and
3. A buyer's provider will then connect them to an nbn-powered plan.

Buyers should speak to their preferred internet provider about the performance and benefits they can expect to receive from an nbn Smart Places connection¹.

FIGURE 5

nbn Smart Places E2E Value Chain

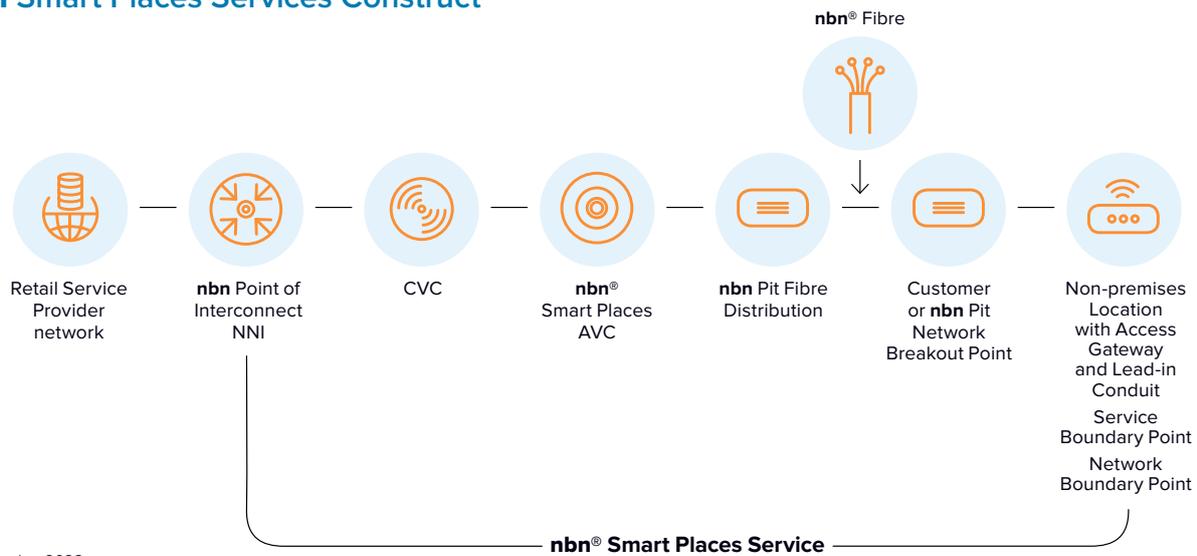


Source: nbn, 2023

¹ nbn is accepting applications for builds to non-premises locations in their existing nbn Ready For Services (RFS) footprint and new developments. Service connectivity availability will depend on internet providers offering nbn Smart Places, and timing of product availability will be at provider discretion. Previously connected Smart Places locations and new developments with pre-built Smart Places infrastructure will not require an nbn network build.

FIGURE 6

nbn Smart Places Services Construct



Source: nbn, 2023

Property developers can include nbn Smart Places in their development by following this six-step process:

1. Plan early. nbn recommends planning ahead by six months.
2. Check eligibility when applying online with nbn.
3. Ensure each site is prepared to the approved pit, pipe, and pathway design requirements.
4. Prepare for build and certification. nbn inspects the proposed site to declare it fit for purpose, which involves issuing a Certificate of Practical Completion.
5. Get installation ready. nbn will then proceed to schedule and install the fibre network with SFP.
6. Be ready to connect. Buyers will then be ready to connect to an nbn-powered plan through their preferred internet provider.

Challenges for nbn

Two of the key challenges nbn faces with selling and delivering its nbn Smart Places product to tech buyers includes infrastructure challenges and competing access technologies in the market.

Network expansion can be a challenge for any network provider. This can include deploying infrastructure in outdoor, non-premise locations such as remote monitoring sites and traffic control systems. nbn

can lean upon its vast experience in delivering network infrastructure across Australia to assist with the deployment of non-premise connections. It will be key for nbn and related stakeholders such as communications service providers and tech buyers to have a strong process in place for deploying nbn Smart Places connections, as outlined in the section above.

It's no secret that other access technologies can provide non-premise connectivity. These are outlined at the beginning of this document and include 3G, 4G, and 5G cellular networks, various LP-WAN connectivity solutions, and satellite options. However, fibre non-premise connectivity provides benefits around lower latency, scalable bandwidth, and QoS, that competing access technologies have not been designed to deliver². The key for nbn (and for RSPs and MSPs) will be to focus on marketing its nbn Smart Places to those use cases that need high grade connectivity, not just for any IoT connection located outside of a building or address.

Conclusion

IDC's research indicates that the non-premise connectivity market in Australia will experience strong growth in the coming years. IDC also sees growth in IoT use cases that require scalable bandwidth and low latency, particularly those use cases that include HDR cameras and video analytics. To this extent, nbn can address these challenges, providing it with a significant opportunity for success.

² Buyers' experience, including the speeds actually achieved over the nbn network, depends on the nbn access technology and configuration over which services are delivered, whether they are using the internet during the busy period, and some factors outside of nbn's control (like buyers' equipment quality, software, chosen broadband plan or how their provider designs its network).

About the Analysts



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Monica Collier is an associate research director with IDC's Asia/Pacific group. Based in New Zealand, Monica works with the regional telecom teams to produce intelligence reports and market insights, and contributes to various consulting projects for leading regional telcos and tech vendors. Monica's current research interests focus on 5G, satellite services, rural connectivity and digital equality, innovative use cases leveraging Internet of Things (IoT), as well as service provider competitive intelligence and strategies.

[More about Monica Collier](#)



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[More about Bill Rojas](#)

Message from the Sponsor

business nbn[®]

Our new **nbn**[®] Smart Places wholesale product is a forward thinking, innovative and flexible smart connectivity solution for businesses and communities alike.

We know businesses and communities are looking to experience the benefits of smart devices, applications and solutions across a range of outdoor locations.

nbn[®] Smart Places turns this desire into reality by enabling the extension of the **nbn** fibre network to a variety of eligible non-premises locations such as traffic lights, CCTV, smart poles, digital billboards, and public Wi-Fi.

As a new **nbn** wholesale product, **nbn**[®] Smart Places is tailored to enable the connectivity for the Internet of Things (IoT) and smart infrastructure to eligible non-premises locations. It also helps streamline organisation operations and improve the quality of service provided to customers and communities.

To learn more about **nbn**[®] Smart Places, RSPs can contact **nbn** directly via their **nbn** account manager.

[Find out more](#)

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