

8 August 2024



2024 Regional Telecommunications Review Secretariat

Department of Infrastructure, Transport, Regional Development, Communications and the Arts

by email: RTIRC@infrastructure.gov.au

Dear Sir/Madam,

RE: 2024 Regional Telecommunications Review

Communications Alliance (CA) welcomes the opportunity to provide input to the 2024 Regional Telecommunications Review (RTR).

This submission is presented under headings broadly corresponding with those presented in the Issue Paper, where questions are directed to industry.

Consumer issues – connectivity literacy, digital inclusion, accurate information.

TCP Code Review and proposed changes

As the Department of Infrastructure, Transport, Regional Development, Communications and the Arts (the Department) is aware, *the Telecommunications Consumer Protections (TCP) Code*, is currently under review. The Code is a registered Code, enforceable by the regulator (ACMA), that sets minimum customer protection requirements for interactions between service providers and their residential and small business customers with respect to mobile, landline and internet (including NBN) services.

Many of the proposed updates the Code address issues identified in the paper. These include new and strengthened obligations that particularly target action and support for consumers in regional and remote areas, and those with lower digital literacy levels, and English as a second language. Proposed drafting includes:

- **mobile coverage:** improved information provision requirements about the 'generally available' mobile network coverage, paired with a requirement for CSPs to permit consumers to exit their contract without penalty should the coverage on the ground not be as indicated or expected. The Code Drafting Committee has also suggested that further consideration of mobile coverage issues be considered in light of the findings of the National Mobile Audit, once that is complete.
- **plain-language:** extended requirements for plain-language communications, to make it easier for all consumers, but particularly those with lower English literacy and /or digital literacy levels, to understand and assess options and obligations. Additional requirements for specific information to be available in

'easy English' are also currently under discussion (increasing the accessibility further).

- **suitable telecommunication products and services:** extended requirements to assist consumers select products and services that best meet their identified needs and budget, including enhanced credit assessment requirements that are designed to protect the consumer from over-extending themselves, without unduly preventing those without credit history from obtaining telecommunications products and services, or unreasonably invading the consumer's privacy. (The proposed requirements are linked to the concept of financial harm and the risk of a debt or default listing of over \$150, in line with the *Privacy (Credit Reporting) Code*.)

CA notes that the iterative drafting process to review and revise the Code continues. Input is welcome. Further detailed information about the TCP Code Review is available on our [website](#).

First Nations-specific initiatives

The Federal Government committed funding in the May 2024 budget to establish a First Nations digital mentoring network and a First Nations digital support hub, modelled on the Regional Tech Hub¹ - a recommendation put forward by the First Nations Digital Inclusion Advisory Group (FNDIAG). CA supports this initiative. The creation of a central hub, as proposed, aligns with suggestions put forward by CA in early discussions with FNDIAG, and would be a useful resource for the industry, as well as for First Nations' people, providing information to help raise cultural awareness on key identified issues. For example, the hub could include information for Retail Service Providers (RSPs) about the general preference of customers in remote communities to use prepaid mobile data, helping RSPs better understand and therefore match those customers' needs.

CA also notes other work of the First Nations Digital Inclusion Advisory Group (FNDIAG) that is relevant to this review, and its support of it. CA is engaged at a CEO level on FNDIAG's telecommunications focus group. Recent topics of discussion that CA has specifically offered assistance on include consideration of whether FNDIAG:

- could leverage CA and the industry's experience in the installation of infrastructure by using the *Telecommunications (Low Impact Facilities) Determination 2018* as a template for installing remote infrastructure among First Nations communities;
- can leverage CA's experience in dealing with energy providers to address energy requirements impacting remote infrastructure reliability and affordability; and
- could work with CA to consider how ACMA rules on Customer Authentication might be amended to address known concerns with requirements that may negatively impact or present an undue impost for First Nations people.

¹ <https://www.infrastructure.gov.au/sites/default/files/documents/first-nations-digital-inclusion-advisory-group-first-nations-digital-inclusion-measures-5june2024.pdf>

CA also supports consideration of the role Government can play to address the affordability of services in remote communities by offering competitively neutral subsidies or financial support to customers.

Further information about CA's engagement with the FNDIAG, including proposed TCP-related requirements (now and ongoing), can be found in our [recent submission](#) to the Department on the First Nations Digital Inclusion Roadmap.

Access, resilience and emergency

As the Issues Paper recognises, it remains technically and economically challenging to provide infrastructure and service across Australia's vast land mass, which disproportionately affects people living in remote and regional areas, where population density is typically low.

However, "despite ongoing challenges, new opportunities are emerging in regional Australian telecommunications"², Mobile Network Operators (MNOs) continue to invest in upgrading their networks to 5G and are exploring sharing opportunities in regional Australia to enable more cost-effective deployment.

Potential benefits of satellite services

Satellite services have long offered the potential of "ubiquitous coverage". There is significant technological innovation taking place in the sector, largely driven by the rapid expansion of non-geostationary satellite orbit (NGSO) systems and the advent of multi-orbit satellite solutions. The lower latency of these Low Earth Orbit (LEOSat) solutions opens up new service opportunities, particularly in the consumer market. The potential benefits for remote Australia have been recognised by the Government.^[1]

Satellite systems of all configurations (GEO, HEO, MEO and LEO) have a role to play in "plugging gaps" in terrestrial connectivity. Satellite systems can provide voice services across the country as demonstrated through the Government's Alternative Voice Services Trial (AVST) program. The Government should holistically assess existing and emerging satellite offerings in their consideration of universal service reform. Further, in certain circumstances, satellites can also provide the speeds and capacity that outperform existing universal broadband services. Future multi-band (Ku/Ka/Q/V bands) networks will deliver reliable high-capacity broadcast/broadband service that will cater to a wide range of market demand nationally.

Satellite services have always been and are expected to continue to be an increasingly important complement to terrestrial networks. Satellite networks are expected to play a central role in providing coverage and service in areas where most terrestrial access technologies are simply uneconomical. Non-terrestrial networks are expected to help to deliver resilient services to consumers and businesses which currently have more limited network coverage, and may provide service in emergencies when the terrestrial networks are unavailable or congested.

² Issues Paper, p.6

^[1] Low Earth Orbit Satellite Working Group – 2023 Chair's Report January 2024

The potential benefits of partnerships between space and terrestrial based networks are already materialising in the market and future technological advances in interoperability, such as those contemplated via 3GPP standardisation, are expected to bring significant social and economic benefits to Australia.

Beyond the benefits that non-terrestrial networks (NTNs) are expected to deliver to consumer user devices, they are also anticipated to have the capability to support both industrial and governmental IoT devices for industries such as transport, health care, agriculture, utilities, the autonomous aircraft/drone sector, national security, public safety and disaster relief.

The speed and effectiveness of integrated networks will in part depend on the regulatory support for such an environment, and CA would encourage the Committee to take an active interest in the issues to support regulatory arrangements that foster the competitive and quick adoption of these technologies, cognisant of the need to avoid any interference with other spectrum usage. For example, CA's Satellite Services Working Group's position on direct-to-mobile services are outlined in its February 2024 [submission](#) to the ACMA.

To assist the reviewers' understanding in this rapidly-evolving area, information about the solutions provided or planned by a range of individual satellite service providers, is provided as an addendum to this submission.

Universal Service Obligation (USO)

The issues in this section are the subject of separate discussion and investigations. As such, CA refers the Committee to its February 2024 [submission](#) to the Department. In summary, CA supports reform of the USO to meet the outcomes of technology neutrality, cost effectiveness, reliable service, clear eligibility criteria and being available in non-commercial locations. The delivery of the existing voice service component via copper twisted pairs is based on outdated technology. A holistic consideration of all available connectivity offerings is required in any USO policy decisions. The existing Statutory Infrastructure Provider (SIP) obligations, network capability and competitive supply of retail voice services suggest a separate universal voice service obligation may not be required within the NBN fixed line and fixed wireless footprints.

Dependence on a resilient energy supply

The resilience of telecommunications infrastructure is inextricably linked to a resilient supply of energy to power the different components of telecommunications networks. Rural and remote areas are often disproportionately affected by natural disasters and the effect of such disasters on energy and telecommunications networks. This is partly due to the natural environment of such areas, as well as the sometimes more limited connectivity options in rural and remote areas which may place a greater reliance on individual providers and/or may create a greater dependence on the functioning of telecommunications networks overall.

CA, through its Communications Resilience Advisory Industry Group (CRAIG) and other fora, continues to pursue improved resiliency arrangements within the

telecommunications sector but, importantly, across sectors, including, of course, the energy sector. CA has entered a Memorandum of Understanding with the Energy Networks Association to foster collaboration and information sharing, including through regular meetings at an operational level. Further work to improve collaboration and information sharing is underway. We also reiterate our comments in relation to the need for improved national collaboration around the sharing of telecommunications, energy supply and situational disaster information that is currently already available but only shared on a State/Territory level between authorities and telecommunications providers, to assist with recovery efforts during disasters/emergencies.

We also note the work currently underway as part of the recommendations contained in the Bean Report, i.e. work aimed at the strengthening of the reliability and resilience of Triple Zero.

Continued investment and innovation are key to delivering regional connectivity goals

In terms of investment, continued industry investment, coupled with targeted Government co-contribution and programs to support uptake and awareness of new services, represents the most effective means of meeting regional Australians' communications needs over the long term. CA notes that initiatives under the [Better Connectivity Plan](#) play – and will continue to play – an important role in connecting Australia. However, co-investment programs need to be well designed and targeted to delivering competitive and high-quality services, particularly to areas with otherwise marginal investment cases. Such an approach would be consistent with an “integrated and coordinated framework for regional development regardless of a region's economic circumstances”.³

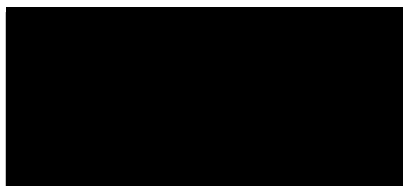
In relation to mobile networks specifically, CA notes that there have been long-term declines in returns on invested capital (ROIC). With high levels of investment required to densify 5G networks and meet growing community expectations⁴, and an ever-increasing regulatory burden imposed on the sector, the dropping ROIC creates a real risk to the industry's ongoing sustainability in Australia. This should be considered in policy discussions.

If you have any questions about this submission, please do not hesitate to contact me, [REDACTED], Senior Manager, Policy and Regulation ([REDACTED] or [REDACTED] Senior Manager, Satellite and Equipment ([REDACTED])

³ Regional Investment Framework, May 2023 Regional Investment Framework: the Australian Government's approach to supporting strong and sustainable regions (infrastructure.gov.au)

⁴ [REPORT: State of the Australian Telecommunications Industry - Venture Insights](#); 13 June 2023

Yours sincerely,



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Chief Executive Officer

About Communications Alliance

Communications Alliance is the primary communications industry body in Australia. Its membership is drawn from a wide cross-section of the communications industry, including carriers, carriage and internet service providers, content providers, platform providers, equipment vendors, IT companies, consultants and business groups.

Its vision is to be the most influential association in Australian communications, co-operatively initiating programs that promote sustainable industry development, innovation and growth, while generating positive outcomes for customers and society.

The prime mission of Communications Alliance is to create a co-operative stakeholder environment that allows the industry to take the lead on initiatives which grow the Australian communications industry, enhance the connectivity of all Australians and foster the highest standards of business behaviour.

For more details about Communications Alliance, see <http://www.commsalliance.com.au>.

Addendum to 2024 Regional Telecommunications Review submission

Satellite provider solutions, services and timeframes

The following solutions by individual satellite service providers detail the types of satellite constellations, together with details on specific elements including frequency bands, orbits, ground-segment requirements etc. The services being offered include where appropriate the applicability to regional and remote residential and business user needs. Satellite service providers have also provided expected Ready For Service (RFS) dates and timeframes.

This information comes from the below specific satellite service providers and is presented in alphabetical order:

1. EchoStar Corporation
2. Intelsat
3. nbn
4. Omnispace
5. Optus
6. SES
7. SpaceX Starlink
8. Telesat
9. Viasat



EchoStar Corporation (EchoStar®) is a premier global provider of satellite communication solutions, headquartered in the United States and conducting business around the globe. EchoStar and its subsidiaries have a global technical, operational, and

marketing presence for satellite and terrestrial services, including S band (2 GHz) rights across Europe and North America.

EchoStar is planning the deployment of the Lyra satellite system, a Low Earth Orbit S band Mobile Satellite Service (MSS) system, based on the Australian filing SIRION-1. Lyra uses up to 30 MHz of S Band spectrum in 1980 to 2010 MHz and 2170 to 2200 MHz. The first four Lyra satellites are scheduled to launch starting on Q4 2024.

For a country as vast as Australia with so much of its territory having inadequate terrestrial mobile coverage, connectivity using MSS is of critical importance. Lyra will be an Australian satellite system capable of providing mobile satellite services and 'Internet of Things' (IoT) connectivity over the entire continent and in fact globally.

The 2 GHz band is unique because the band has been globally allocated on a primary basis to MSS, mobile service (MS) and fixed service (FS), which provides an opportunity for a hybrid satellite/terrestrial operation to offer instant and reliable global communications anywhere on the planet delivering social, economic, public safety and humanitarian benefits to government, enterprises, and consumers regardless of where they live or operate.

Satellite services

Lyra will provide mobile communications everywhere, unconstrained by population density or terrain. This means farmers, miners, tourists, and emergency services workers, need never be

without reliable communications. The addition of the 2 GHz bands to MSS in Australia will provide competition and additional choice in the market driving user affordability.

The availability of interoperable devices, alongside the expanding suite of cloud-based applications (as well as voice and data) create increased demand for MSS. MSS networks are increasingly employed as the connectivity solution for Internet-of-Things (IoT) and Machine-to-Machine (M2M) communications.



INTELSAT.

Intelsat operates the world's first Globalised Network, delivering high-quality, cost-effective video and broadband services anywhere in the world using C-, Ku- and Ka-band satellites with wide beams and spot beams. With our fleet of geosynchronous (GEO) satellites and developing solutions in MEO and LEO, Intelsat can deliver rock-solid connectivity to customers virtually anywhere in the world. Intelsat's Globalised Network combines the world's largest satellite backbone with terrestrial infrastructure, managed services and an open, interoperable architecture to enable customers to drive revenue and reach through a new generation of network services. Thousands of organisations serving billions of people worldwide rely on Intelsat to provide ubiquitous broadband connectivity, multi-format video broadcasting, secure satellite communications and seamless mobility services. The end result is an entirely new world, one that allows us to envision the impossible, connect without boundaries and transform the ways in which we live.

Satellite services

Intelsat is supporting the following industries:

- Commercial Aviation - We provide inflight connectivity to 25 Commercial Airline Partners and nearly 3,000 aircraft
- Land Mobility - Users in mining, rail, oil and gas, first responders, border security, and disaster response are discovering innovative ways to optimise their operations in hard-to-reach locations or where other networks simply don't exist. Whether there is a need for mobility or for portable connectivity, Intelsat's land mobile services meet the demands of teams in motion
- Maritime – We are the largest provider of connectivity for the offshore oil and gas market
- Telecommunication Networks - seven out of the world's top ten Mobile Network Operators (MNOs) work with us
- Cellular backhaul over satellite enables MNOs more ways to provide uninterrupted voice and data services to customers. It expands their coverage into more geographic areas where previously considered economically and feasibly beyond their reach
- With our cellular backhaul managed service, MNOs can back up and build out 2G, 3G, 4G, 5G, and IoT coverage anywhere, in less time and more cost-efficiently than when relying on terrestrial backhaul alone
- Media - We reach over two billion people via television and radio
- Government - Secure Communications for Mission Success - Intelsat partners with government ministries around the world to help their civil defence agencies connect to programs, resources, and to each other. They rely on our secure, cost-efficient, high-performance satellite networks to power mobility applications in the air and on the ground that range from border security and remote military operations to disaster preparedness and recovery.

Timeframe

Intelsat holds licences in Australia to operate and provide commercial services in Australia.



NBN Co is the owner and operator of two geostationary orbit (GSO) satellite operating in the Ka-band - 27 GHz to 31 GHz (earth to satellite), and 17.7 GHz to 22 GHz (satellite to the Earth), and currently in orbit 36,000km above the earth.

Sky Muster I was launched in 2015 and operates in geostationary orbit of 140° East. **Sky Muster II** was launched in 2016 and operates in geostationary orbit of 145° East.

The Sky Muster satellites are the first high-throughput, Ka-band satellites launched to focus exclusively on Australian and provide high speed broadband to areas that cannot access **nbn** fibre or fixed wireless networks.

Satellite Services

The Sky Muster satellite service delivers the **nbn** broadband network to homes and businesses in regional and remote Australia. So, people across mainland Australia and Tasmania, and remote islands such as Norfolk Island, Christmas Island, Lord Howe Island and the Cocos (Keeling) Islands can enjoy **nbn** powered broadband plans through Sky Muster satellite providers.

nbn's Sky Muster Satellite network is currently a critical part of the national broadband infrastructure, providing:

- Australian-owned and secure access across the country (including the most hard-to-reach and remote parts of Australia); and
- free standard installation and ongoing maintenance of **nbn** equipment at a wholesale level to retail service providers, for residential and small business customers.
- A range of capped and uncapped data plans to support the budgets and needs of remote homes and small businesses enabling all types of data services including web browsing, downloads, social media and video streaming. Voice and video conferencing, including distance learning, is conducted daily across the **nbn** Sky Muster network.

In December **nbn** unveiled Sky Muster Plus Premium with plans designed for homes and small businesses, that include uncapped data usage for all internet activities and a choice of speeds, including a high-tier option with maximum wholesale speeds of 100/5 Mbps at least once every 24-hour period and an anticipated typical busy period wholesale download speed of 37 Mbps.

nbn's satellite network also supports commercial aviation via the **nbn** Satellite Mobility Product.

Timeframe

Currently in use and providing services.



Omnispace is the owner and operator of global non-geostationary orbit (NGSO) mobile satellite system in the 2 GHz S-band (1980 to 2025 MHz earth-to-space / 2170 to 2200 MHz space-to-earth).

Further Details:

- Omnispace's Medium Earth orbit (MEO) S-band filing for 1980 to 2025 MHz / 2170 to 2200 MHz was brought into use (BIU) with the F2 satellite through Papua New Guinea (PNG) administration's NICTA and has been notified to the ITU
- Omnispace's MEO filing for 6925 to 7075 MHz / 5100 to 5250 MHz has been brought into use, notified, and fully coordinated through the UK administration's Ofcom
- In April and May 2022, Omnispace launched and brought into use two Low Earth Orbit (LEO) S-band satellites also through PNG
- The ACMA granted Omnispace a licence to provide S-band mobile satellite (MSS) Internet of Things (IoT) services to remote and rural Australia
- Omnispace Australia also holds licences for its C/X-band gateway and has an operational satellite Earth station in Ningi, Queensland

Satellite services

Omnispace Australia looks forward to the ACMA completing policy development and releasing the full S-band (1980 to 2005 MHz and 2170 to 2195 MHz) for MSS purposes. This spectrum is crucial for providing 5G NTN (non-terrestrial network) MSS services to rural and remote Australia.

Omnispace is now investing in new technology and infrastructure as part of its next-generation global constellation to integrate terrestrial mobile and satellite networks into one seamless connected experience. The Omnispace network will expand critical global communications, including consumer, enterprise, government and Internet of Things (IoT) connectivity, directly from its satellites in space to mobile devices everywhere. Leveraging 3GPP mobile standards, Omnispace is focused on the delivery of global voice, text and data direct-to-device (D2D) solutions for users, devices and industries worldwide.

Omnispace is currently offering MSS capacity in various markets through its existing operational on-orbit F2 satellite network. The F2 satellite network is the first element of the NGSO constellation that will be capable of providing 24 x 7 coverage around the globe.

Omnispace's integrated MSS system can provide a broad range of commercial and government communications services, including:

- **Industries:** Commercial services to enterprises in oil, gas, mining, fishing, agriculture, etc.
- **Connectivity:** Internet connectivity in maritime and rural and remote areas
- **Emergencies/Public Safety:** Communications during natural and man-made emergencies, as well as disaster warnings to the public and government agencies
- **Internet of Things (IoT):** Connected car applications, smart city (urban and rural), transportation and logistics (on-shore and off-shore)
- **Unmanned Aerial Vehicles:** Situational awareness for disasters such as fires, damage caused by weather events, delivery, insurance inspections, etc.
- **Hybrid:** Filling the gaps in areas that are lacking in coverage or capacity due to blockage or density
- **Aviation Networks:** hybrid networks that utilise both satellite and terrestrial networks to provide Internet access to aviation interests



Optus is Australia's most experienced satellite owner and operator, with satellite services across Australia, New Zealand and with availability to McMurdo Sound in Antarctica.

We're also Australia's second largest telecommunications company, providing services through our national mobile networks, fixed networks and geostationary satellites.

We work closely with global suppliers and continue to be at the forefront of utilising cutting-edge space technology and employing, as well as training, highly skilled space talent.

Since 2003, Optus has also provided critical mission capabilities for the Australian Defence Force – operating the C1 Satellite which, at the time of launch, was the world's largest commercial and military hybrid spacecraft.

Optus' main satellite operations centre is located in Belrose, on the outskirts of Sydney. We also have other operation stations in Lockridge (WA), Hume (ACT) and Regency Park (SA).

From these stations, we conduct 24/7, 365 day-a-year satellite network monitoring, support and troubleshooting across a range of industries – as well as continuous video, voice and data delivery.

Satellite Services

VSAT Services

The Optus SatData product provides fixed-site locations with Very Small Aperture Terminal (VSAT) technology. We offer this service across a wide range of industries, including emergency services, education, utilities, aviation, maritime, mining, oil and gas, and other areas that require connectivity in regional and remote areas.

Dedicated Data

Dedicated 1:1 bandwidth for your services offers guaranteed data – which means your connection will maintain a steady speed. We can reserve this bandwidth because it's not being divided amongst various subscribers the way it would be on a contended (or shared) connection.

For Businesses and Governments

Our services provide high performance and reliability through dedicated Committed Information Rate (CIR) capacity, combined with flexible Peak Information Rate (PIR) options.

We know that things in business can change quickly, our solutions are scalable, allowing you to expand bandwidth as your demand grows. Our solution can provide backhaul connectivity to your facilities, cloud services and internet backbone.

In addition to our own satellites, we are partnering with world-class International Low Earth Orbit and Geosynchronous Equatorial Orbit satellite data providers to enable us to find the best solution for your business.

Plus, to ensure that everything keeps running smoothly, we have an Australian-based support team that monitors our satellite network 24x7.

Small cells

Optus satellite's software-defined, low-power, low-impact small cell cellular base stations deliver 3G and LTE Optus mobile coverage. These cells support:

- A typical coverage area of up to 7km radius, subject to terrain and antenna elevation
- VoLTE, including emergency calls
- Speeds of up to 70Mbps download and 6 Mbps upload

This service is separate to direct to mobile LEO offerings.

Depending on your requirements, our satellite small cells can be deployed standalone, or attached to existing infrastructure, including:

- On-grid rooftop installation with battery backup
- Off-grid standalone solar powered deployment with high availability battery backup
- Custom-designed installation on existing or new poles or tower

Transponder solutions for satellite operations

Transponder solutions are available on a full-time basis for customers with large and specialised wideband communications applications. You'll receive access to the power and bandwidth of the allocated Optus Satellite transponder capacity, subject to any special conditions. Transponder Services can be offered in conjunction with hosting, uplink and downlink services if required. Customer Earth stations will need to be approved by Optus to ensure interference-free coexistence with other users on adjacent transponders or satellites.

Professional Service

We can manage and support all aspects of spacecraft procurement – from the development of the business case, all the way through to handover of the asset in orbit to your operations team, or to ours if you would like us to fly your spacecraft for you. The process of procuring a spacecraft for replacement of in-orbit capacity typically occurs several years prior to the existing spacecraft's end of life. This allows time to procure a spacecraft, but also allows for a potential launch failure scenario, with enough time to build and test another replacement spacecraft (and relaunch the replacement spacecraft) in time. Before the launch can occur, the spacecraft also goes through a rigorous testing phase/campaign to ensure that all subsystems work to the specified performance requirements, and that everything is operational.

Timeframe

Optus has been providing premium satellite services for over 35 years and holds applicable licences in Australia.

SES SES has a bold vision to deliver amazing experiences everywhere on Earth by distributing the highest quality video content and providing seamless data connectivity services around the world. As a provider of global content and connectivity solutions, SES owns and operates a geosynchronous orbit fleet (GEO) and O3b medium earth orbit (MEO) constellation of satellites, offering a combination of global coverage and high-performance services. By using its intelligent, cloud-enabled network, SES delivers high-quality connectivity solutions anywhere on land, at sea or in the air, and is a trusted partner to telecommunications companies, mobile network operators, governments, connectivity and cloud service providers, broadcasters, video platform operators and content owners around the world.

Satellite services

Data Connectivity Services: At SES, we tailor industry-focused network solutions that are powered by our fleet of MEO and GEO satellites, strategic LEO partnerships, and extensive ground infrastructure. We deliver these solutions as managed services supporting industries such as aviation, maritime, enterprise and oil and gas, or governments.

- Connects over 300 customers in 130 countries on planes, ships, oil rigs
- Helps restore connectivity during emergencies and after natural disasters
- Supports telcos with network roll-outs and connecting remote areas

Media Services: With access to global reach and extensive portfolio of end-to-end managed services, we help broadcasters, platform operators, content owners and sports organisations grow their audience and deliver superior multi-screen and multi-device viewing experiences — whether on linear channels, video-on-demand (VoD) and streaming platforms, or social media sites.

- Broadcasts over 6,400+ TV channels to >1 billion people
- Reaches 363 million TV households
- Delivers HD & Ultra HD content to any platform, on any device
- 620+ hours of premium sports & events per day

Timeframe

SES holds licences in Australia to operate and provide commercial services in Australia using GEO and MEO satellites. Our Mobile Backhaul service is currently delivered to Australian territories, which has been incorporated as part of a software defined wide area network (SDWAN) solution to support our Australian customers' needs.

STARLINK Starlink is the world's first and largest satellite constellation using a low Earth orbit to deliver broadband internet capable of supporting streaming, online gaming, video calls and more.

Leveraging advanced satellites and user hardware coupled with our deep experience with both spacecraft and on-orbit operations, Starlink delivers high-speed, low-latency internet to users all over the world.

Satellite Services

Starlink provides truly global coverage anywhere on Earth including all of Australia with more than 5,900 satellites in low earth orbit and both ground-to-satellite and satellite-to-satellite links (optical intersatellite links). Whether a subscriber is at home, at school, or in-motion moving hundreds of kilometres an hour at sea or in flight, Starlink is delivering fibre-like broadband connectivity to subscribers, helping to reduce the digital divide and providing critical connectivity when communities are impacted by crises.

Starlink customer premises equipment, known as Starlink Kits, are simple to deploy, install and use, with no professional experience or formal training needed. A description and up-to-date information on Starlink service plans currently offered in Australia can be found at <https://www.starlink.com/service-plans>.

Starlink provides unlimited high-speed, low-latency internet through its Standard plan, which can be used by households to support multiple users simultaneously conducting voice and video calls, browsing the internet, video streaming, gaming and accessing essential services such as government services, online banking and health services. For business and government use, Starlink also offers Priority service plans, which are higher tiers of service that can support over 100 users and are intended for high-demand use cases that require in-motion use, open ocean coverage, network priority and priority support features including enterprise and backhaul use cases.

In 2023, expanding beyond satellite broadband, Starlink announced its first direct-to-cell mobile operator partnerships, which will deliver space-based mobile connectivity to mobile subscribers on partnered mobile networks at times and in areas when terrestrial capabilities are otherwise unavailable. Our direct-to-cell service will leverage payloads on Starlink satellites to connect existing market-available mobile devices on partner networks without requiring hardware modifications. This transformative and cutting-edge service will offer consumers the safety and peace of mind of a phone call or SMS message to loved ones or first responders during times of crisis or when they are in remote locations. Future direct-to-

mobile services will also bring IoT capabilities to remote sensors, creating exciting use cases in agriculture and livestock support, environmental monitoring, remote energy, and ground transportation tracking.

Time Frame

Starlink has served Australian subscribers since 2021. Today, almost four years later, Starlink has nation-wide coverage of Australia and a growing subscriber base of over 200,000 Starlink subscribers using Starlink as a broadband connectivity solution for homes and offices, recreational vehicles, offshore and maritime vessels and private and commercial aircraft. Starlink is working together with Australian mobile network operators to deliver direct-to-cell SMS capabilities in short-order to their mobile subscribers nation-wide, with the goal to deliver voice and data services soon-after.

Australian consumers have used Starlink in extraordinary ways. For example, during flooding in New South Wales in 2022, government agencies and non-profit organisations used Starlink to restore connectivity to cut-off communities to support disaster-relief efforts. Starlink technology has also been leveraged by social impact organisations, including the Foundation for Indigenous Sustainable Health to provide access to health technology in both the Muludja and Bawoorrooga remote communities and by the Royal Flying Doctor Service to enable the first virtual emergency centre in the outback town of William Creek.

TELESAT Backed by a legacy of engineering excellence, reliability and industry-leading customer service, Telesat Corporation ("Telesat") is one of the largest and most successful global satellite operators.

Telesat works collaboratively with its customers to deliver critical connectivity solutions that tackle the world's most complex communications challenges, providing powerful advantages that improve their operations and drive growth.

In addition to our state-of-the-art global, geostationary satellite fleet, Telesat Lightspeed™, our Low Earth Orbit network, will be the first and only LEO network optimized to meet the rigorous requirements of telecom, government, maritime and aeronautical customers. Telesat Lightspeed will redefine global satellite connectivity with ubiquitous, affordable, high-capacity links with fibre-like speeds.

Telesat also provides industry-leading technical consultation and support services to satellite operators, insurers and other industry stakeholders around the globe.

Telesat Lightspeed

Telesat Lightspeed is a highly innovative global network consisting of state-of-the-art Low Earth Orbit (LEO) satellites seamlessly integrated with on-ground advanced data networks. It is capable of delivering low latency, high speed, secured and resilient broadband connectivity globally at any time.

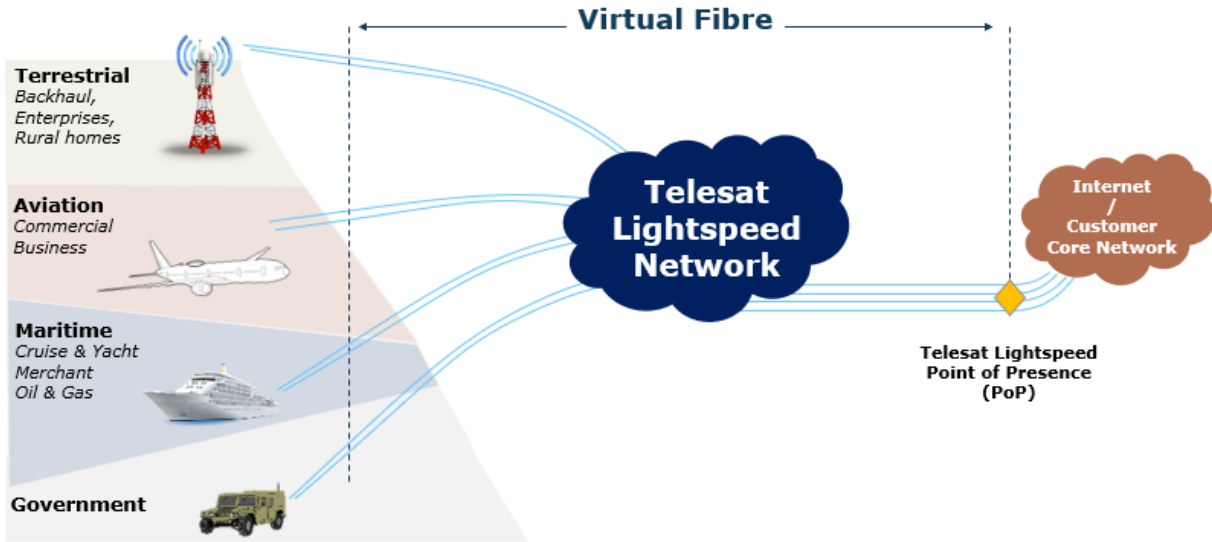
To maximise system efficiency, Telesat Lightspeed is designed as a highly flexible system that will dynamically allocate capacity based on demand. In terms of coverage, each satellite in the constellation will be designed with multiple steerable beams, inter-satellite links and onboard processing.

A variety of fixed and mobile user terminals across different industry verticals would access Telesat Lightspeed constellations via user links in Ka-band.

Telesat Lightspeed will be compliant with Metro Ethernet Forum standards, allowing Telesat Lightspeed services to be integrated seamlessly into existing telecommunications networks. This standards-based approach will make it easy for Telesat's potential customers to implement Telesat Lightspeed as a core component in their broadband infrastructure and operations.

Telesat Lightspeed will revolutionise the delivery of high capacity broadband and will offer communications capabilities in areas where wired and wireless networks are absent or might not provide adequate coverage.

Telesat Lightspeed is designed to respond to the continuously increasing demand for globally available, fibre equivalent broadband. Due to the system's seamless global coverage, Telesat Lightspeed user terminals will enable government, enterprise, and other end users, to rely on fixed and mobile communications, with extended flexibility and reliability, in remote areas and while on the move.



Fibre Quality Broadband for Multiple Markets

This is also of particular interest to the maritime industry (merchant, cruise, fishing, yachting) as well as the aeronautical users (business, transport, and passengers), that have traditionally had only limited connectivity options.

Apart from the land, air and sea applications, Telesat is also interested in partnering with Governments around the world for several high bandwidth applications. Offering outstanding security, quality, global coverage, resiliency and seamless mobility, Telesat Lightspeed can support governmental efforts in several areas such as defence, humanitarian aid and disaster relief efforts. In addition, Telesat Lightspeed can also facilitate applications related to critical infrastructure, corporate communications, telemedicine and other remote communications that will positively affect users' efficiency and quality of life.

Timeframe

End 2027



Viasat is proud of the work we do in Australia from offices in Canberra, Melbourne and Sydney. We provide multi-orbit communications technology solutions. Our Australian business works with NBN to connect regional Australia to the internet via their Sky Muster satellites, and with Telstra to provide reliable USO voice satellite telephone services to the most remote residents in the outback. We have partnered with indigenous Australians, via the Centre for Appropriate Technology, for a state-of-the-art satellite station in Alice Springs for Earth observation. We deliver in-flight broadband satellite Wi-Fi on Qantas, as well as space networks and ground stations for the Australian Defence Force.

In 2023, Viasat acquired Inmarsat – a global provider of satellite broadband services, satellite safety communications and portable/mobility satellite communications. Inmarsat solutions connect Australians through solutions such as GX (Global Xpress) for high-speed broadband, portable and rugged satellite telephony solutions, and the world-renown Inmarsat Maritime communications solutions and much more.

We soon will launch our next generation satellite for Asia Pacific, ViaSat-3 APAC – designed and built in our own payload facility. Viasat-3 APAC is one of the three Ultra High Throughput satellites of the ViaSat-3 global GSO constellation that will provide over one Terabit per second on each satellite, about ten times what was possible when Sky Muster was procured. That means much higher speeds, and more bandwidth, at lower costs for Australian consumers, businesses and defence forces in Australia and globally, on land, in the air, and at sea.

ViaSat-3 APAC will serve Australia and the APAC (Asia-Pacific) region from an orbital location of 160 degrees East in the Ka band (17.7 to 21.2 GHz and 27.5 to 31 GHz).

ViaSat-3 will provide high speed broadband to users throughout Australia including to fixed premises (VSAT) and those on ships, aircraft, and ground transportation by way of Earth stations in motion (ESIM) fitted to these platforms.

Viasat can also provide community broadband by providing high-speed connectivity to community-offered Wi-Fi service (and the newly released Wi-Fi bands in some countries); as well as providing satellite-powered connectivity to mobile base stations.

This allows fast broadband connectivity for education, healthcare, commerce, agriculture and personal communications to be provided cost-effectively across urban, sub-urban, and underserved and unserved regions.

Viasat will also offer fast broadband services direct to individual users, businesses, healthcare facilities, government, agribusiness and mine-sites anywhere in Australia.

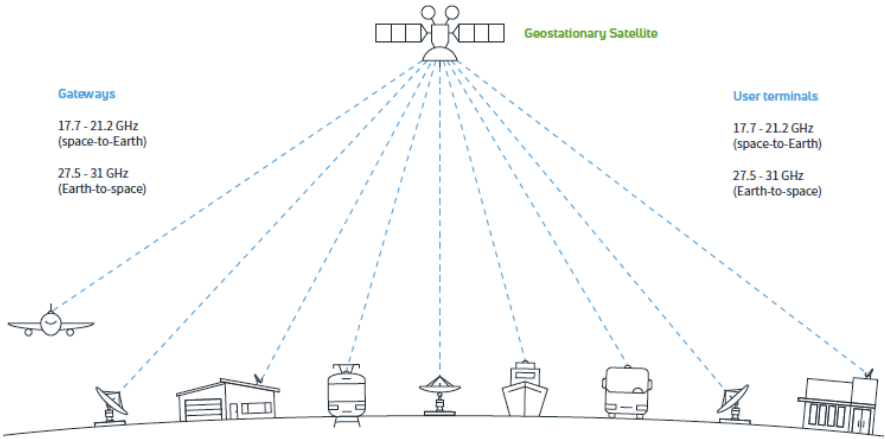


Figure 1. ViaSat-3 forms of service delivery

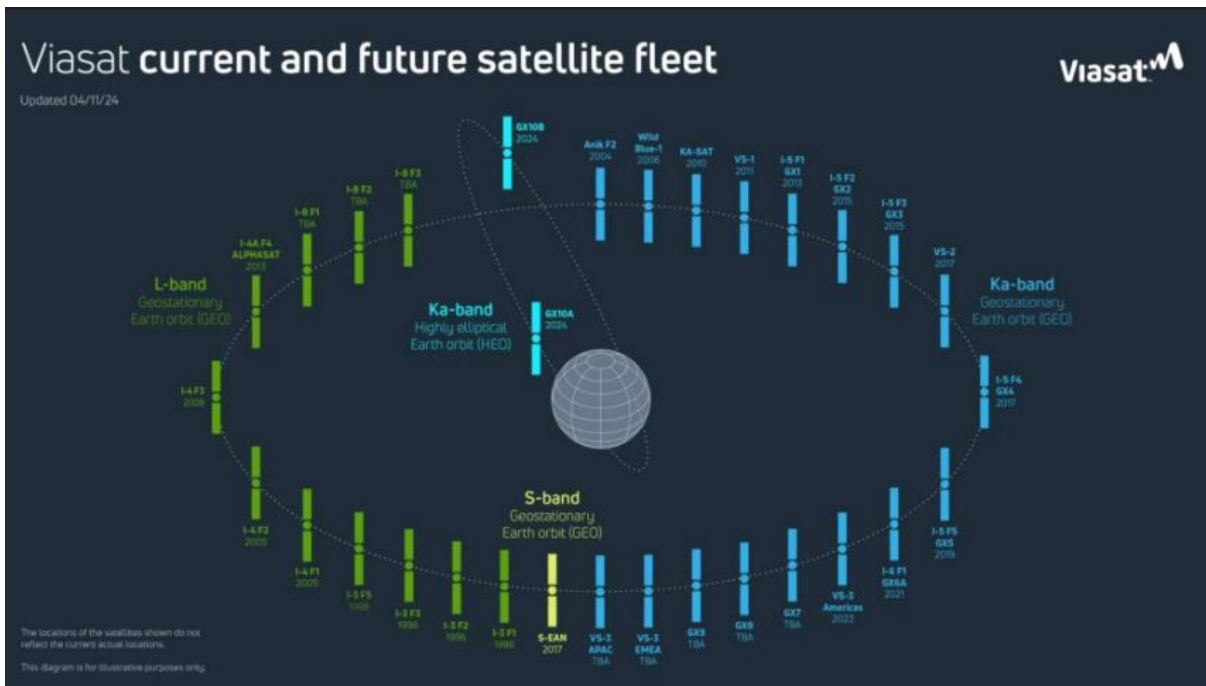


Figure 2. Viasat global satellite fleet

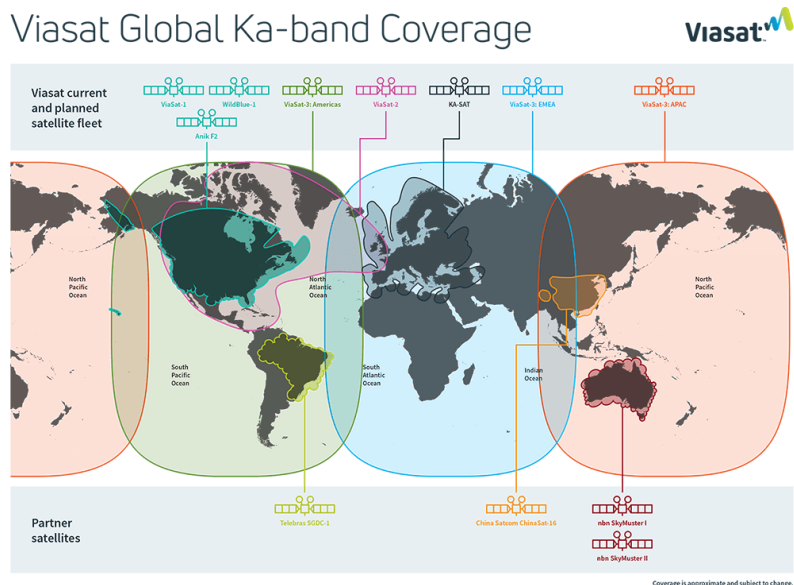


Figure 2. Global and APAC (including Australia) footprint of existing and planned ViaSat Satellites, including the upcoming ViaSat-3 APAC Ultra High Throughput satellite

Satellite services

Viasat offers high speed broadband to all Australians regardless of where they live work or travel. Viasat solutions support individuals, communities, farms, and mine-sites, and enable businesses to vastly improve efficiency through access to broadband anywhere on the enterprise.

ViaSat-3 APAC Timeframe

2025