

**COMMUNICATIONS
ALLIANCE LTD**



**Submission to Australian Space Industry
Capability Review**

Satellite Services Working Group (SSWG)

Submission

29 AUGUST 2017

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INTRODUCTION

The Satellite Services Working Group (SSWG) of Communications Alliance is pleased to have the opportunity to make a submission in response to the Review of Australia's Space Industry Capability Issues Paper released in August 2017

Communications Alliance is the primary telecommunications 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, search engines, equipment vendors, IT companies, consultants and business groups.

Its vision is to provide a unified voice for the telecommunications industry and to lead it into the next generation of converging networks, technologies and services. The prime mission of Communications Alliance is to promote the growth of the Australian communications industry and the protection of consumer interests by fostering the highest standards of business ethics and behaviour through industry self-governance.

The SSWG is a group of 21 companies active in the space sector in Australia and focused in particular on the commercial communications satellite industry. Membership of the SSWG includes commercial satellite operators, satellite manufacturers and equipment suppliers, ground infrastructure suppliers, installers and operators, consultants and independent experts. A list of SSWG members is at **Attachment 1**.

The space industry comprises many different and important fields of activity. We note, nonetheless, that 75% of global space activity is in the commercial sector and believe that this should be reflected in the way that Government engages with the space sector as a whole.

As a consequence, the SSWG remains ready to contribute meaningfully to Government space policy development in Australia.

Issues for Consideration

Definition

The Issues Paper seeks to define the nature of the space sector, identifying 'upstream' and 'downstream' activity.

The SSWG believes that an additional useful starting point would be to agree a definition as to where "space" begins and to consider the associated issues that may flow from that definition.

Although no hard rules exist, space has been most commonly thought to begin at the Karman Line – an altitude of 100km above sea level and the point at which the Earth's atmosphere becomes too thin for aeronautical purposes.

The Karman Line was, for example, used as the starting point of space in the United Nations Outer Space Treaty of 1966/7.

The SSWG believes that 100km is a reasonable altitude from which to define the beginning of space.

It may be useful also to define the region between the limit of commercial airline activity – approximately 18km and the beginning of space. This 'high altitude' or 'near space' region

of the atmosphere is one in which new forms of activity are emerging as spacecraft, aeronautical and wireless technology push back pre-existing boundaries.

Project Loon balloons, for example, operate at an altitude of 20km. Other high-altitude balloons have reached higher than 50km. The more general category of High Altitude Platform Stations encompasses many other concepts designed to provide communications at these altitudes and for which international studies are becoming more intense within the International Telecommunication Union (the UN Agency specialising in communications).

Solar powered drones have reached altitudes of up to 29km and have potential to become part of national or global provision of broadband services. These sub-space altitudes have the dominant feature of low latency with delays equivalent to terrestrial fixed and mobile networks, whilst offering instant coverage.

We suggest that the review will benefit from having clear and defined boundaries and terminology as it works towards formulating a strategy and vision for the future that can also consider high altitude platforms.

Vision

The Issues paper points to commentary about the lack of an overall vision for the Australian space industry, and singles this out as an issue for consideration.

The SSWG agrees that this is an important gap and suggests consideration of an 'Industry Summit' of leading local and international industry representatives who could come together (virtually or physically) to fashion a vision of the future and the opportunities which exist.

From that starting point the work of a capability audit and gaps should begin. The issues paper refers to building on current capabilities. We suggest setting the bar higher, in pursuit of an appropriate vision crafted with assistance from the international launch industry, manufacturing of hardware for space and terrestrial applications, communications industry experts who can point out the future trends where satellite services and sub-orbital communications have great potential. The satellite services envisaged would cover the complete gamut of geostationary and non-geostationary constellations or single satellites.

Intellectual Property Transfer

Intellectual Property transfer is not singled out among the areas that the review will specifically address. The SSWG believes it does warrant specific attention, because of its importance to the development of new competencies and new areas of economic activity.

A parallel development in the Defence Support Industry is instructive. It appears that the Government is working on a major IP agreement with a large European shipbuilding entity and will accompany this with the creation of a Naval Shipbuilding Academy to develop skills in naval architecture and design and, hopefully create the basis for a revitalised naval shipbuilding design and manufacturing industry created in Australia for decades to come.

This is the sort of bold step which would see a much enlarged and serious prospect for Australia in the satellite industry, for both Defence and commercial applications. It does not rely on what already exists, but takes a leap in faith and commitment.

The New Zealand Space Agency is taking similar steps by leveraging Government funding for Regional Research Institutes to create the NZ Centre for Space Science Technology to undertake research and to exploit opportunities in international data satellite brokerage, space-based imagery and the growing Cubesat sub-sector.

This said, we do acknowledge the capability-building initiatives that the Government has undertaken in recent years, including the Cooperative Research Centre on Spatial Information (CRCSI), the Space Environment Research Centre (SERC) and the Australian Space Research Program (ASRP). These are threads which can be drawn together in a dynamic and far reaching plan.

Potential Skills & Investment Drain

There is a material risk that, unless regulatory and investment-incentive settings are well calibrated in Australia, we will lose important expertise to overseas markets and miss out on opportunities for significant investment in the Australian space sector. This should be noted within the aims of the review.

The development of the OneWeb global satellite system, based in the UK, and the emergence of New Zealand as a satellite launch location are but two examples of overseas developments that might lure many of our 'young, best and brightest' away to foreign opportunities.

Setting regulatory parameters astutely is also important. Several years ago, Australia missed out on a very significant ground-segment investment opportunity by a global satellite operator, primarily because satellite licence fees in Australia were globally uncompetitive.

In more recent times, and to its credit, the ACMA has reduced some Ka-band satellite licence fees by up to 50 per cent – although the SSWG still believes there is scope to build further on that progress and generate a 'win-win' result.

Some Communications Alliance members have also cited the public liability insurance requirements for an overseas launch in Australia as a barrier to potential investment. These requirements can be satisfied at no cost, through appropriate negotiations with the launch provider, but this is unclear in the current legislation. Currently the law is opaque on this matter and leads applicants for a launch licence down the path of working out 'maximum probable loss' which is not a helpful direction. The regulations should ideally encourage the relevant parties to attend to this matter which exposes Australian taxpayers to unnecessary risk. The law could be amended to give users better guidance on how to do this.

Potential Australian Space Agency

The SSWG recognises that there is support for the establishment of an Australian Space Agency and this is reflected in the Issues Paper. The SSWG supports the concept, but subject to some attendant considerations.

The SSWG believes that an Australian Space Agency should be designed primarily as an organisation to provide industry facilitation and government coordination/liaison. As there is a number of Australian Government Agencies already involved in the space environment, an Australian Space Agency could be the central 'go-to place', a body that would assist applicants and other interested parties with their space-related needs.

It is interesting to note that the recently created New Zealand Space Agency has been granted regulatory powers. Some of our members are not convinced at this stage that this would be appropriate in Australia. In particular, members are concerned about the risk of simply creating an additional regulatory body and set of red tape that has to be engaged with.

The SSWG notes that the Civil Space and Cyber Security section of DIIS provides regulatory and policy oversight on other matters related to space activities, and the Australian Communications and Media Authority (ACMA) is responsible for the regulation of spectrum for space activities, including the coordination of satellite orbital resources in conjunction with the ITU. The SSWG believes it makes sense for the ACMA to continue this role, given the synergy with existing spectrum management responsibilities and its relationship with the radiocommunications sector in the ITU.

Commercial Capabilities and Opportunities

Throughout the communications industry there is burgeoning interest and massive uptake in digital communications leading to what is known as 5G and the Internet of Things. In turn, these bring vast complementary opportunities to the satellite industry of the future, using a combination of existing satellite bands, and future mm-wave bands. Integrating satellite technology into these future broadband 5G scenarios is highly topical with the Global VSAT Forum working closely with plans developing in the USA, Canada, Argentina, China, Singapore, Africa, the ME and Europe.

A consistent drive is towards an integrated ecosystem where satellites will deliver enhanced mobile broadband, massive machine-type communications, and ultra-reliable and low latency communications where terrestrial communications on its own falls short. A further strength of satellite solutions exists in the area of content distribution to cached local presences or to ubiquitous simultaneous delivery of, say, automobile software.

In Australia, existing commercial interests include ground/terrestrial infrastructure, Telemetry, Tracking and Control (TT&C) stations, gateways, and user terminals. There is untapped potential for Australia in this sector, which is made attractive because of Australia's land mass and (relative) political stability.

The SSWG believes that other areas of significant new opportunity for the Australian space sector include:

- development of leading edge satellite-based resiliency solutions (in both space segment and ground segment) in the broadcasting, broadband, emergency communications and disaster recovery spaces. (See break-out information on the recent initiative by O3B and Project Loon to assist Peruvians hit by a flood disaster.)
- next-generation compression equipment to further boost the throughput and flexibility of commercial satellite fleets
- the greater use of satellite backhaul to optimise the rollout of 5G mobile networks. Satellite backhaul is very efficient for high-speed low-volume use cases. 5G networks move many capabilities to the network edge and will feature more and smaller network cells, creating potential for greater satellite involvement
- similarly, Internet of Things networks will primarily be driven by low-bandwidth, high-volume transmission. Where latency is not critical, opportunities will emerge for geostationary satellites. Where low latency is at a premium, low-orbit satellites and sub-orbital high-altitude networks may also play an important role.

The space industry supports many critical national interests. The following list highlights the broad nature of these interests: earth observation, national security, border protection, extending Australian industry overseas, monitoring weather and climate change, mining, assistance in natural disasters (a key component), consumer and business demand for broadcasting and two-way fixed communications, broadband mobile communications for aircraft, ships and land mobiles.

The following examples of commercial activities have been provided by our members to demonstrate some of past and present initiatives that are making an impact to the Australian environment:

- **UniSA** – their business developments that have been spun out of their activities, including in the space and Internet of Things (IoT) fields.
- the **Advanced Instrumentation Technology Centre (AITC)** at Mt Stromlo. Industry could harness the capabilities that the centre offers. See <http://rsaa.anu.edu.au/technology/advanced-instrumentation-technology-centre>.
- the **Culgoora Solar Observatory**. CSIRO was commissioned to develop antenna technology that was used in by OTC and also used overseas in countries such as Vietnam, Kazakhstan and Laos.
- services such as receive-only television reception of worldwide and Australian programming, electronic news gathering, broadband fixed and mobile communications especially in rural and remote areas, satellite navigation services and weather forecasting.

O3b Networks Works with Project Loon Team to Reconnect People Recovering from Floods in Peru

Combination of Innovative Satellites, High Altitude Balloons and Local Telecommunications Expertise Provides Internet and 4G/LTE Solution for Flood-Ravaged Country

May 17, 2017 04:10 PM Eastern Daylight Time

ST. HELIER, Jersey--(BUSINESS WIRE)--O3b Networks, a wholly owned subsidiary of SES, today announced that it has worked with X, Alphabet's self-described "moonshot factory," to provide high throughput, low latency broadband internet and 4G/LTE mobile service via Project Loon in Peru.

Recently, the El Niño weather phenomenon has deluged parts of Peru with nearly 10 times the typical rainfall, causing widespread flooding and mudslides which have caused heavy damage to telecommunications infrastructure. Many Peruvians have been displaced, and the Peruvian government wanted to restore communications capabilities as quickly as possible.

Project Loon, with its balloon-based internet network, was in an ideal position to provide much needed infrastructure support. Loon balloons float in the stratosphere at an altitude of 20km, and can extend connectivity to where it is needed regardless of any situation below. X had already been flying Loon balloons over Latin America for several months, running connectivity tests with telecommunications partners. So, when ground infrastructure began to be impacted by the flooding, the Project Loon team reached out to the government to offer its innovative solution—providing basic internet and mobile connectivity over the Loon balloons already aloft.

The Project Loon team worked with O3b Networks—the only satellite network able to provide fiber-like throughput and latency to fully support native 4G/LTE—as well as several local technology partners to join in restoring connectivity to Peruvians affected by the flooding. The combination of the Project Loon targeted cell coverage and O3b's FastConnect, a rapidly deployable fiber-like performing satellite terminal providing high speed connection to the internet, was the perfect combination to provide much needed communications infrastructure to those in the impacted regions.

"O3b is very excited to be working closely with the Project Loon team, Peruvian government, and other collaborating technology companies to help tens of thousands, hit hard by the recent floods, get back online," said Steve Collar, CEO of O3b Networks. "The project has already carried 160 GB of data to people over a 40,000 square kilometre area. This is a perfect example of companies and government thinking outside the box and working together to make a positive impact on communities in need."

Mechanisms for Industry Input to Government Policy

The commercial side of the Australian satellite sector has long felt that it has not always been easy to open the doors to contribute to space policy development.

In 2013, in the wake of the Satellite Utilisation review, the Government created a Space Advisory Council (SAC) as a formal avenue from input to Government from across the space sector. Communications Alliance was pleased to accept an invitation to be part of the SAC.

In the ensuing four years, however, the SAC has never been convened to hold its first meeting – an outcome that is obviously disappointing.

The SSWG believes that the Space Review should consider the appropriateness of recommending the invigoration of the SAC or a similar channel to Government, given that this has not been effective to date. Clearly, if a Space Agency was to be established, it could sensibly be responsible for this function.

Government Coordination and Roles

The SSWG wishes to offer the following observations with respect to the roles of Government Departments and Agencies:

- to highlight the importance of inter-department coordination, with an aim of avoiding duplication and reducing where appropriate any unnecessary multiple layers of regulation and the associated administration burden.
- the division of roles/responsibilities between agencies. In Australia arrangements are workable but could be streamlined. The SSWG suggests international comparisons of arrangements, such as those employed the USA and New Zealand, to identify what aspects here are working and what could benefit from a review.
- the interaction between policy setting and regulatory agencies could be strengthened when considering the needs of an investing industry. The relevant Government Departments include DIIS, DoCA, Finance and the Department of the Attorney General.
- the limited remit of the ACMA with respect to the relevant international treaties.

One overseas regulatory administration worth examining is ARSAT in Argentina. Although not necessarily a model for Australia, it is of interest to see how the Argentinian Government has harnessed the expertise of its commercial sector

Attachment 1

Membership of the Communications Alliance Satellite Services Working Group as at August 2017

APN
Coutts Communications
Mississippi Consulting
Foxtel
FreeTV
Inmarsat
Intelsat
Ipstar
Nbn
Omnispace
Optus
Orion Satellite Systems
Pivotel Satellite
SES
Skybridge
Space Systems/Loral
Speedcast
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ViaSat
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