



International Aerospace Law & Policy Group
Australia's Air & Space Lawyers

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Committee Secretary
State Development, Natural Resources
and Agricultural Industry Development Committee
Parliament House
George Street
Brisbane Qld 4000

BY EMAIL: sdnraidc@parliament.qld.gov.au

Dear Dr Dewar

Inquiry into job creation opportunities in Queensland arising from the establishment of an Australian space industry

Thank you for the opportunity and invitation to contribute to the State Development, Natural Resources and Agricultural Industry Development Committee's Inquiry.

International Aerospace Law & Policy Group (IALPG) is a specialist law practice focussed on aviation and space law, but also advising on maritime, Defence and associated practice areas. It was founded in 2015 by Joseph Wheeler, and includes, as one of its consultants, Duncan Blake, one of the foremost experts in space law in Australia. For further background information please see **Annexures 1 and 2**.

IALPG's submission identifies four opportunities for the Queensland Government to consider that will create Queensland jobs directly or indirectly by facilitating growth in the Australian space and other industries. The opportunities include building or developing:

1. A launch facility for small satellites,
2. A testbed to enable industry participants to test equipment prior to launch,
3. A space innovation hub that is co-located with launch facility and testbed, and



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4. A professional suite of services to facilitate small business and regulatory requirements for space companies.

1. Launch Facility

The benefits of a small satellite launch capability for Australia are numerous. However, Australia does not yet have a launch facility to enable this capability. The vast proportion of Australian launch-related enterprises are already based here in Queensland,¹ and with Queensland's wide-open spaces and long eastern coast, its historical connections to founding aviation in Australia (QANTAS), and its close relationship with Defence industry, Queensland is well-situated as a location for an Australian launch facility. As noted in the 2017 White Paper of the Space Industry Association of Australia, 'Advancing Australia in Space', the global space industry has typically experienced returns on investment more than four times the initial investment considering the value chain and indirect effects and close to 10 times in societal benefits.² By providing support and seed investment for a launch facility situated in Queensland, the Queensland government could realise great benefits for both the industry generally and the local economy.

Australian entrepreneurs are already developing technology that will require an on-demand small satellite launch facility to meet the rapid global growth in manufacture and sales of small satellites.³ This on-demand capability would be supported by the Australian Defence Force (ADF), especially if, as IALPG has suggested in its submission to the Australian Government Review of Australia's Space Industry Capability,⁴ it is developed in part by committing to an ADF launch every two years, in conjunction with the ADF's Exercise TALISMAN SABRE, which occurs at Shoal Water Bay Training Area. IALPG is in a position to help facilitate this and would be happy to meet with the Queensland government to discuss how it might be achieved.

2. Space Technology Testbed

Before a launch facility can be fully utilised by Australian space enterprises however, Australia needs to prioritise the development of a test facility, particularly in relation to the development of launch technologies. This is a recommendation that has been echoed by

¹ Gilmour Space Technologies, Hypersonix, BlackSky Aerospace, Heliq Advanced Engineering, UQ, USQ, Teakle Composites and Moody Space Centre are all launch-related space enterprises already situated in Queensland.

² Space Industry Association of Australia, 'Advancing Australia in Space', White Paper of 21 March 2017, pp 13 – 14, available at <http://www.spaceindustry.com.au/prezi.php>

³ Particularly Gilmour Space Technologies, Hypersonix and BlackSky Aerospace.

⁴ IALPG submission to the Australian Government Review of Australia's Space Industry Capability, p 10, see **enclosure**.

several industry participants as a key enabler for Australian space enterprises. Again, for many of the reasons outlined in the above section, as well as the benefits that would come with co-location of a launch facility, Queensland is ideally suited as a location for a testbed.

3. Space Innovation Hub

Australian space industry enterprises should be encouraged to find opportunities to complement each other to increase their competitive edge globally.⁵ The Australian space industry is characterised by many new enterprises in relatively niche areas of space technology. It is the collaboration among these enterprises that will provide more comprehensive solutions to global problems, needs and demands, and will enable the Australian space industry to win more global opportunities. While there are other hubs that foster innovation and collaboration, typically in or close to the Australian cities, these are not necessarily suited to enterprises that involve significant development in technology. An innovation hub that is co-located with a testbed and launch facility would give Queensland a leading-edge in attracting entrepreneurs.

A testbed could also be a foundation for the concept of ‘Space Prize Australia’, linking it to Great Air Race to Australia initiated almost 100 years ago by one-time Queenslander, Prime Minister ‘Billy’ Hughes. Other global space prizes have had great success in attracting investment in the industry, even if competitors did not ultimately succeed to claim the prize. A testbed, together with the concept of ‘Space Prize Australia’, would be a means to attract a lot of positive attention, innovation, energy and investment to Queensland. ‘Space Prize Australia’ was first suggested by IALPG⁶ and IALPG will continue to promote the concept with the aim of both advancing space technology and boosting the Australian economy.

4. Professional Services for Space Companies

Facilitating or identifying novel ways to provide space companies with professional services will enable other sectors of Queensland to participate and benefit from the progress of the space industry. These could be focused on providing professional services including accounting, corporate advice, legal, and so on that will support new ventures in setting up businesses, navigating the legislative/regulatory approval process (some of which are still being developed), protecting intellectual property rights, and fostering collaboration with other Australian space industry participants. IALPG is already innovating, in collaboration with others, to develop new ways to help Australian space entrepreneurs to navigate the

⁵ IALPG identified the need for the collaboration within the Australian space industry in its submission to the Australian Government Review of Australia’s Space Industry Capability, p 11, see **enclosure**.

⁶ <https://theconversation.com/yes-weve-got-a-space-agency-but-our-industry-needs-space-prize-australia-98703>

national, international and foreign laws and regulations applicable to their prospective global sales.

Conclusion

We thank you for your invitation to contribute to the inquiry by the State Development, Natural Resources and Agricultural Industry Development Committee and commend the four opportunities to the Committee for its consideration. We assure you of our availability to discuss any or all of those opportunities further with you and with the Committee.

Yours faithfully



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Enclosure: IALPG Submission to the Australian Government Review of Australia's Space Industry Capability, August 2017.

Annexure 1 – Summary Biography of IALPG Founder

Joseph Wheeler , MRAeS, LLB, BA(Psy) (UWA), GDLP (Qld), GCert Air & Space Law (McGill)

Joseph is one of the few post graduate alumni of the McGill University Institute of Air and Space Law in Montreal, Canada, who practices in the field of law predominantly for industry, pilots, remote pilots and passengers. He is an elected Member of the Royal Aeronautical Society, and:

- Consults as Aviation Legal Counsel to the Australian Federation of Air Pilots providing individual, association and government affairs advice (AFAP is Australia's largest pilot professional association by member numbers);
- Consults to other law firms, providing advice and representation on air disaster and injury cases to Australian and overseas clients;
- Is Aviation Spokesperson for the Australian Lawyers Alliance, the leading social justice legal professional association in Australia;
- Is a Vice Chair to the Legal Committee of the International Federation of Airline Pilots' Associations (IFALPA) in Montreal, and Member of the Professional & Government Affairs Committee of IFALPA representing AusALPA (Australia's member association to IFALPA, made up of AFAP and the Australian and International Pilots Association, AIPA). Joseph represents IFALPA at certain ICAO forums including the ICAO Legal Committee;
- Appointed to the Management Committees of organisations which advocate for aviation safety through specialist technical, professional, or pilot health and wellbeing programs through member representation or other initiatives, including Australian Certified UAV Operators Inc (ACUO) and HIMS Australia Advisory Group Inc (both of which are Queensland incorporated not for profit associations, and the latter is a recipient of CASA financial sponsorship); and
- A regular commentator on aero legal and aero political affairs for a variety of media channels.

Joseph has worked in the Australian Government and was responsible for airport economic regulation policy oversight, and planning and development, as an Assistant Director in the

Airports Branch, Canberra, from 2011 – 2013. He has published more than 100 articles in total in peer reviewed journals, newspapers, magazines, legal websites, and on topics as broad as air safety policy, international law, aviation conventions, RPAS regulation, and topical policy development in Australia and at ICAO. He also speaks regularly at international conferences on aviation legal and policy topics, most recently on the notable mass air disasters this decade (MH17 and MH370), RPAS regulation and policy, and the legal approaches to future Australian technical capabilities like urban air mobility.

Annexure 2 – Summary Biography of IALPG Consultant in Space Law and Strategy

Duncan Blake, BEc, LLB (UWA), LLM (Melb), ACSC, LLM Air & Space Law (McGill)

Duncan transferred from the permanent Air Force to the Reserves in January 2017, after 22 years as a Legal Officer in the Royal Australian Air Force. He worked at the tactical, operational and strategic levels at home and on deployment overseas. Duncan recently returned from the Middle East where he was providing legal support to aerial targeting operations in Iraq and Syria. He has worked with strike and fighter jet forces and units responsible for airspace surveillance. He has also been a prosecutor for the military. He served as the Deputy Director of Operations and International Law for the Australian Department of Defence, providing operations and international law advice and support at the highest levels within Defence and across government.

More recently, Duncan was legal advisor to the Defence Space Coordinating Office and he founded and chaired inter-departmental and international working groups in respect of strategic space law. His last posting, before transferring out of the permanent Air Force, was in a non-legal position, managing the development of a future joint operations concept for military use of outer space, to coordinate capability development and force structure decisions in the Australian Defence Force.

Wing Commander Duncan Blake continues to contribute as a Reserve legal officer, providing backfill and supplementation in a directorate that advises government on the potential military role in existing and prospective contingencies. He also supports the Military Law Centre / Asia Pacific Centre for Military Law in various courses and other tasks of the centres.

Duncan has contributed extensively to doctrine and policy for the Australian Department of Defence and whole-of-government, on issues of operations law and space law. Although this work is not publicly accessible, he has authored many public articles, including an article for which he was awarded the 2011 Lieber Society Military Prize by the American Society of International Law.

He has undergraduate degrees in Law and Economics from the University of Western Australia, a Master of Laws (LLM) degree from the University of Melbourne and an LLM from McGill University. He is also a graduate of Australian Command and Staff College. His thesis topic for his LLM at McGill University was on the need for a 'Manual on International Law Applicable to Warfare in Space'.

Duncan is currently Managing Editor for a project to draft the Woomera Manual on international law applicable to military space activities, helping to lead a group of international experts to draft such a manual, aiming for publication in 2020. He is also undertaking doctoral research at The University of Adelaide on a topic associated with the Project.

Duncan consults on law and strategy for space services for International Aerospace Law & Policy Group and he is a member of the Advisory Council to the Space Industry Association of Australia.



**Submission of International Aerospace Law & Policy Group
(IALPG) to the Australian Government *Review of
Australia's Space Industry Capability***

Prepared by

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August 2017

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Who are IALPG?

International Aerospace Law & Policy Group (IALPG) is a specialist air and space legal practice based in Queensland, comprising Australian Founding Principal Joseph Wheeler, foreign and domestic based aviation and space legal and policy experts who consult to the practice, including one local aviation safety and technical consultant who is both a qualified solicitor and full time international airline pilot.

Joseph Wheeler, Principal is one of the few post graduate alumni of the McGill University Institute of Air and Space Law in Montreal, Canada, who practices in the field of law predominantly for pilots and passengers. He is an elected Member of the Royal Aeronautical Society, and Aviation Legal Counsel to the Australian Federation of Air Pilots providing individual, association and government affairs advice (AFAP is Australia's largest pilot professional association by member numbers), National Head of Aviation Law at Maurice Blackburn Lawyers, a member of the Legal Committee of the International Federation of Airline Pilots' Associations (IFALPA) in Montreal, representing AusALPA (Australia's member association to IFALPA, which is made up of AFAP and the Australian and International Pilots Association, AIPA). IFALPA represents over 100,000 pilots and flight engineers worldwide and has observer status at ICAO. Joseph is a member of the Professional & Government Affairs Committee of IFALPA and appointed to the Management Committees of organisations which advocate for aviation safety through specialist technical, professional, or pilot health and wellbeing programs through member representation and other initiatives, including Australian Certified UAV Operators Inc (ACUO) and HIMS Australia Advisory Group Inc, as well as a regular commentator on aero legal and aero political affairs for *The Australian*.

Duncan Blake, Consultant (Space Law & Strategy) served in the Royal Australian Air Force as a legal officer in postings at the tactical, operational and strategic level in Australia and deployed abroad. Duncan recently transferred to the Reserves and joined IALPG as a Consultant. He is recognised as a leading expert globally on the law of outer space in a military and strategic context. His experience spans legal support to military operations in all domains (land, sea, cyber, electronic and particularly air, as well as space).

In addition to his numerous formal qualifications and resulting knowledge, Duncan has had a wealth of practical experience, including direct support to fighter pilots before and after operational sorties, support to deliberate and dynamic aspects of the targeting cycle in an Air Operations Centre, and support to and across the highest levels of government on the application of international and domestic law to military operations. He has chaired inter-departmental and international working groups on space law in a strategic context and written and contributed to many publications professionally and academically, including an award-winning article on legal reviews of emerging weapons. In addition to his role as Consultant at IALPG, Duncan is Deputy Editor-in-Chief of the MILAMOS Project

(www.mcgill.ca/milamos), a PhD candidate and continues to contribute to the Australian Defence Force as a Reserve legal officer.

Duncan became closely engaged with Australian space industry as a whole in his last posting, where he managed the development of a concept for future military use of space, which included the essential relationship between the Defence space industry and the civil space industry.

Duncan and IALPG are keen to facilitate a stronger Australian space industry, as well as finding ways for all sectors of the global space industry to collaborate in the development of global space governance for a more stable and better connected world.

Introduction

Thank you for the opportunity to contribute to this review.

We make this submission specifically drawing on Mr Blake's 22 years of experience with Defence in operations law, space law, strategy for military use of space and on engagement with Australian space industry in his Defence role and more recently in his consultant capacity.

Consistent with Mr Blake's knowledge, skills and experience, the focus of this submission is on professional support (law and related strategy) to the space industry. While this naturally aligns with governance mechanisms, the conclusions are not limited to governance mechanisms. As a part of the Australian space industry (rather than as an external supporter of it), we seek to develop with the industry through governance mechanisms that will enhance Australia's comparative advantages and mitigate our constraints, gaps and limitations.

Therefore, recognising the current capabilities of the Australian space industry and the opportunities for development is integral to submission about optimal governance of the industry. Solutions to Australian and global industry problems are not just technological, not just economic or commercial and not just regulatory, but all of these together. Components of the space industry are inter-connected – it is not profitable to examine space support, or any other component, in isolation.

Furthermore, space law and strategy support to space industry is a capability in itself, like other components of the space industry, and innovative approaches to domestic collaboration and organisation can be marketed globally to earn export income.

For all of these reasons, this submission follows the themes set out in the issues paper: Australia's comparative advantages in relation to our current space capabilities, the need and opportunity for development and governance structures adapted to this. In particular, this submission proposes two areas of concentration as organisational, motivational and strategic pivots for the Australian space industry and its development into the foreseeable future.

Current Capability

Comparative advantage

The issues paper identifies technical expertise, geography and Australia's alliances as sources of Australia's comparative advantage in competition throughout the global space industry. These are a means to attract custom, but used judiciously, can do considerably more. They can also be leveraged by Australian enterprises for their own advantage (not just the advantage of customers) and they can be leveraged in negotiations with customers and potential collaborators for greater synergistic benefits. This submission expands on these points in relation to proposed areas of concentration for the Australian space industry.

Before doing so, it is important to acknowledge a related, but separate, area of comparative advantage.

Beyond our formal alliances and well beyond our geographic boundaries, Australia has a well-deserved reputation in international fora as an 'honest-broker', more focussed on pragmatic solutions and less on balancing against potential great-power adversaries or continental competitors.

This can also be leveraged in support of the Australian space industry, although leveraging this comparative advantage requires broad foresight and authority in relation to the Australian space industry as a whole, rather than individual enterprises.

Capabilities

The issues paper identifies eight categories of upstream and downstream industry. This submission is not made on behalf of any specific enterprises in any one of those categories – we are not in a position to speak authoritatively about current capabilities within those categories. Nevertheless, we can speak authoritatively about space law and strategy support to space industry. First, though, we wish to make a number of general observations (with specific examples) about current capability in the Australian space industry.

First, Australian space industry comprehensively encompasses all categories of upstream and downstream industry. That is, it has capacity to relatively quickly develop capability in all categories, even if we lack current capability in some categories (such as launch). Australia should not see itself as limited in the space industry goods and services that we can provide.

However, we do currently lack depth and experience in the large-scale space applications (large rockets, large satellites, large constellations) and the most highly technical aspects (crewed missions and rendezvous and proximity operations). The development of this capability is challenging without an 'ecosystem' of space entrepreneurs, investors, research and development, and customers. Building up this ecosystem is a stepping stone towards 'deeper' aspirations by forward-thinking entrepreneurs like Gilmour Space.

Second, Australia has developed, and is developing, a particular niche in respect of Space Situational Awareness (SSA). Not only do we have a growing number of bespoke sensors for SSA located in Australia (including space object laser tracking by EOS), but entrepreneurs like Saber Astronautics, together with DSTG, are developing means to ‘mine’ data from non-traditional sensors to provide a richer ‘picture’ of activity in the space domain. This is complemented by work at Skykraft (UNSW Canberra Space) to better model orbital dynamics.

These two broad observations are foundational to the two proposed areas of concentration for the Australian space industry.

Space law and strategy support

Returning to space law and strategy support to the Australian space industry, there has not traditionally been heavy demand for dedicated services within the Australian space industry. Nevertheless, Professor Steven Freeland has a significant global reputation in respect of his academic contribution to space law and his contribution to legal policy, not just in Australia, but across the Tasman, in Europe and around the world. Michael Davis has been a pioneer in respect of commercial legal support to private industry in Australia, but is now dedicated to facilitating the Australian space industry more broadly. Together, they have been involved in training and mentoring many others in space law, although none others have dedicated as much focus to the subject.

International Aerospace Law and Policy Group aims not only to provide space law services to Australian space industry, but can also offer marketable skills, knowledge and experience for export beyond Australia.

We bring our own niche. After 22 years in Defence focussing on operations law, military aviation law and space law and, in the last several years, managing the development of a future joint operating concept for military use of space (in engagement with allies and industry), Mr Blake is well-placed to put space law support in a strategic context.

International Aerospace Law and Policy Group brings a wealth of experience in legal support to the aviation industry, including advocating for Australian aviation regulatory and international legal interests globally. This is particularly useful in innovations by analogy with an industry with which the space industry has many connections and parallels.

We can compete globally. Like Australia, a medium size has advantages. The legal industry in Australia that can support the space industry is not so big that we are inwardly-focussed and highly specialised, nor not so small that our expertise is broad, but thin. Australia is not so big that initiating multi-disciplinary conversations, with multiple stakeholders at various levels of industry and government is so complex that it is vanishingly rare. On the contrary, International Aerospace Law and Policy Group is engaged in relatively direct conversations through the whole of nation (multiple stakeholders at various levels of industry and government). Australia is big enough to be a respected participant in international

conversations and to be given access to alliance thinking at a higher level than comparable enterprises in bigger States.

For example Mr Blake has had the honour to regularly contribute to, for example, the UN Conference on Disarmament meetings on space issues, to classified alliance discussions (Combined Space Operations), to high-level think-tank workshops on space issues hosted by the UK Foreign and Commonwealth Office, as well as helping the New Zealand Government to develop their position on space law. And Mr Blake initiated and is Deputy Editor-in-Chief for the Project to develop a Manual on International Law Applicable to Military uses of Outer Space (MILAMOS) – possibly the one initiative in normative development for the space domain with the greatest prospect of success in the foreseeable future. Mr Blake also mentors young delegates in the Space Generation Advisory Council’s Space Generation Congress to propose supplementary protocols to the *Outer Space Treaty* to adapt it to the needs of future generations. This is consistent with the first of two proposed areas of concentration for development of the Australian space industry.

Need and Opportunities for Development

While our alliances offer Australia a significant comparative advantage, they also beg a question. What is the rationale for developing the Australian space industry if we have access to the space capabilities of our allies? That assumption - that our access to space capabilities of our allies is assured on terms that meet our needs - must be tested. Furthermore, it is not just a matter of whether our needs are met, but whether there are opportunities that could be grasped.

Australia’s sovereign margin

There is a ‘sovereign margin’ – the delta described by the extent to which our needs are not assured. In the strategic context, our principal ally, the US, anticipates that in future major conflicts its access to space will be contested. This is the case because potentially adversaries understand the advantages that accrue to US military forces through access to space. The same is true of other allies – although they have a lot less capability than the US and Australia has only limited access to it. In circumstances in which access to space is contested, and the owners and operators of space capability have an immediate national need to secure access to space, it would be naïve to think that Australia would continue to enjoy the usual access to our allies’ space capability without interruption.

This is especially the case because Australia, unlike its principal ally, currently lacks the means to reconstitute space capability on which it relies (Australia does not have a current launch capability). The greatest deficiencies relate to space-based Intelligence, Surveillance and Reconnaissance (ISR), or Remote Sensing in a civil context, and SATCOM. In the civil context, the proliferation of terrestrial and undersea cables, as well as the development of the National Broadband Network might seem to meet the demand, but for the insatiable demand for mobile high bandwidth services and the need to service remote areas in Australia. In the

military context, this extends to offshore areas (which encompasses constabulary operations on the high seas, as well as military operations in other States) and disaster-affected areas. In those and other contexts, there is also a growing demand to facilitate internet-connected sensors and other devices (the ‘Internet of Things’) wherever they may be – a demand that Fleet Space and Myriota are looking to satisfy.

Assured access to space also implies maintaining a good awareness of the situation in space – especially in respect of natural threats (such as space weather), inadvertent threats (such as radio interference) and deliberate threats (the growing proliferation of counter-space capabilities). It would be inefficient and ineffective to develop our own catalogue of space objects independently of the catalogue maintained by the United States Air Force, but we should ensure that our contribution to allied and global SSA is so highly valued, that we are assured uninterrupted access to all SSA data.

In the absence of a means to reconstitute space capability ourselves, our best prospect of assured access to space is promotion and facilitation of a stable, rules-based global order for outer space. A logical next-step to enhancement of Australia’s SSA capability is making a contribution to space traffic management. While the commercial benefit of this activity may not be immediate, it is a means to directly facilitate a stable, rules-based global order for outer space. It also creates a baseline or ‘normal’ behaviour, making it easier to identify and address aberrant behaviour.

Opportunities arising from Democratisation

In addition to the needs that flow from our sovereign margins, there are opportunities arising from trends in the space industry.

In the past, the space industry was characterised by few and large-scale infrastructure (such as satellite systems). There were only a few and big customers making large, complex purchases. The development of small satellites and small rockets means that costs can be spread among larger groups and innovations in the uses of space-derived data brings the end consumers more directly into the economic chain. The ideal is to provide services for large-scale consumer participation – in which, rather than a few consumers making large, complex purchases, there are millions of consumers making many small, simple purchases.

While Australia has technical expertise in analysing and adapting space-derived data for end consumers, it lacks the population domestically to make many innovations economically viable. Therefore, export is essential – either comprehensive product solutions, or components of a global supply chain.

Opportunities in the very long game – Space Traffic Management

Almost all of the current challenges in global space governance could be addressed by an effective global regulator. Without such a regulator, space suffers the same ‘tragedy of the commons’ that afflicts other global commons. As space becomes more democratised and exploitation of natural resources in outer space becomes a commercial reality, this tragedy

will become more apparent. The need for a global regulator will become palpable. It is extremely unlikely, though, that the international community would accept any one State as the global ‘gatekeeper’ to outer space.

The more likely scenario is that an international organisation or multi-national corporation will emerge to undertake that role. That entity will be a very powerful and potentially very wealthy body in regulating the access to outer space.

Australia should be thinking ahead now about its role with respect to this entity. It is very unlikely that an Australian-derived solution could provide a comprehensive option as a global regulator for access to space. Instead, Australia should position itself to provide a significant and critical part of the regulator role. Probably the most significant part is likely to be space traffic management. An effective system for space traffic management will provide the foundation for other aspects of the regulation of outer space – such as exploitation of natural resources.

By analogy, Australia has a reputation in the global aviation industry as an ‘honest-broker’ – an intermediary for others seeking pragmatic solutions to challenges in that industry. Australia is active in developing Standards and Recommended Practices and among the best in the world on their application. Australian air traffic controllers are responsible for approximately 11% of the world’s airspace. UNSW Canberra Space (‘Skykraft’) is conducting active research on technical aspects of the analogy between air traffic management and space traffic management as well as developing a better understanding of orbital dynamics. This is in addition to Australia’s already acknowledged niche in respect of SSA.

Australia has an opportunity now to position our space industry as a critical component of future global space regulation. In the meantime, Space Traffic Management could be developed as a marketable service for insurers and satellite operators.

On-demand small satellite launch

The second, proposed area of concentration for the Australian space industry is on-demand small satellite launch. Australia has a sovereign rationale for development of this capability. As discussed above, Australia currently lacks the capability to reconstitute space infrastructure in the event of natural, inadvertent or deliberate disruption. This is in spite of a clear need for assured access to ISR / remote-sensing and SATCOM.

The concern is particularly apparent in the Defence context. Mr Blake has elsewhere advocated for the ADF to collaborate with allies to develop not just a reconstitution capability, but an augmentation and supplementation capability. This recognises that military campaigns typically last many years. Rather than the government investing in strategic satellites of our own in advance of an immediately tangible need, small satellites can be launched to meet the needs of an immediate military campaign. This capability could be

developed by committing to launch a satellite biennially, as part of Exercise TALISMAN SABRE.

This has multiple benefits. For our allies, particularly the US, it develops a site and means for redundancy in launch capabilities. We can leverage off this to develop our expertise, using expertise from the US. We can also share capacity – encouraging other allies to develop similar capability – and collectively launching constellations as required. The launch of small satellites also encompasses all categories of upstream and downstream space industry, thereby developing our capability across the board.

While the Defence context may provide some of the rationale, an on-demand, small satellite launch capability could provide a valuable export market. Australia has considerable technical expertise, but lacks the industry to retain talent. This would help. Australia also has the geography and economic wealth to develop an on-demand, small satellite launch capability more quickly and effectively than many competitors.

Collaboration

Competition for Australian space industry is predominantly global, not domestic. The small satellite capability is already competitive and likely to become more so. Australian space industry enterprises should be encouraged to find opportunities to complement each other and achieve synergies in order to provide comprehensive solutions with more agility and focus than others.

Innovation in how we collaborate could itself be an area for export earning.

Governance

A concept for space cooperatives

Collaboration is the key to effective governance to promote and facilitate the Australian space industry. Consistent with the issues paper, industry must take the lead role.

- It can do so by forming cooperatives, relatively comprehensively covering the field of upstream and downstream industry. This allows the enterprises, through the cooperative, to develop agile, comprehensive, but focussed solutions to customers throughout the globe.

While Australian space enterprises are already adept at defining their own commercial realities, a cooperative could help them to spread costs and reap the benefits of collective approaches. The cooperative could, for example, spread the costs of common professional services, such as standard solutions to export control constraints and standard approaches that balance intellectual property protection against flexibility and rewarding innovation and risk in the most beneficial ways.

The cooperative could provide training and development for members, could identify and fund research and development of common interest, and undertake domestic and international advocacy and marketing for the members. The cooperative can help members to identify and seize commercial opportunities.

Australian Space Agency

In contrast, there is a need for a body with authoritative capacity to represent the industry as a whole and to regulate the industry. An Australian Space Agency could focus more broadly on the Australian space industry and look further ahead to facilitate the realisation of ‘blue-sky’ opportunities for the industry (that is, whereas the space cooperatives help enterprises to identify and grasp opportunities, the Space Agency creates opportunities).

Thus, the Space Agency would advocate in global space governance fora for the importance of Space Traffic Management and for the central role of Australian space enterprises in regulation of the space domain.

The time is right to form an Australian Space Agency – we can pick and choose lessons from existing space agencies. The Space Agency can leverage off, as well as concurrently enhance, Australia’s current reputation, co-opting others to our causes. Whereas the space cooperatives would engage in operational collaboration, the Space Agency would facilitate collaboration, by maintaining databases, spreading awareness, running conferences/seminars/working groups and fostering growth. The Space Agency would foster innovation – not just in technology, but also in organisational and collaborative approaches – in order to beat US economies of scale with more agile and clever collaboration.

Conclusion

Some of our ideas could be detailed more candidly in a Commercial-in-Confidence environment. Thus, we would be grateful for a confidential meeting with the Chair of the Expert Reference Group and would welcome such an opportunity.