

Tyvak Australia Pty Ltd
Submission to the Review of Australia's Critical Infrastructure Protection Legislation with
Reference to Systems of National Significance (SONS)
and the Proposed Protective Security Obligation (PSO)

Tyvak Australia Pty Ltd is pleased to submit this response to the Consultation Paper released in August, 2020 *Protecting Critical Infrastructure and Systems of National Significance*.

The Tyvak Group, established in 2013, is the world's most successful designer, builder and operator of small satellites, supporting numerous government and private customers and a range of diverse missions. More about the company can be found [here](#). The Tyvak group is wholly owned by the Terran Orbital Corporation which has its headquarters in Irvine, California.

In 2019, Tyvak announced that it would establish an Australian subsidiary in Adelaide. COVID-19 has put paid to these plans and the company is re-assessing where to locate the satellite integration facility that it intends to establish in Australia.

Tyvak is already intimately involved in the Australian industry sector. Tyvak is building three satellites for each of two Adelaide-based companies, Myriota and Fleet Technologies; the first of these satellites are scheduled to launch early in 2021. Tyvak also owns and operates a ground station at Peterborough in South Australia.

The comments that follow are confined largely to the space sector and are offered on the basis of our heritage and experience outlined above.

The Space Sector as Critical Infrastructure

Tyvak supports the addition of the space sector to the list of critical infrastructure sectors identified by Government.

In offering this support, Tyvak notes the dependence that Australia has on data and services from satellites owned and operated by nations and by companies that are beyond the reach of Australian domestic law.

Defining the Space Sector

Sector specific briefings and follow-on individual consultations would seem to be leading to a definition of the space sector, that may look something like this in the revised legislation:

Critical Space Sector infrastructure includes systems that provide the following services:

- *Position, Navigation and Timing*
- *Space Situational Awareness and Tracking*
- *Communications Tracking, Telemetry & Control*
- *Remote Sensing Earth Observations from Space*
- *Space weather monitoring*
- *Access to Space.*

There might be a further rider:

For the purposes of this legislation, critical space sector infrastructure includes commercial and civil satellites and supporting facilities on Earth that are used to monitor space weather and that transmit or receive radio and optical communications to and from satellites and other space objects that may represent a threat to Earth.

Acting alone, the Department of Home Affairs acting is in no position to enhance the resilience of these systems. Any guarantees about assured and secure access to these services and data are simply beyond its capacity to enforce. Space security is a complex activity involving the cooperation of numerous government departments and agencies. In the case of Australia these would including the Departments of Foreign Affairs, Home Affairs, Defence, Treasury, Finance, Industry and Communications. Almost certainly, the Department of the Prime Minister and Cabinet would also need to be involved to coordinate policy development and appropriate assignment of resources across these Departments to ensure that all were contributing necessarily and sufficiently to Australia's efforts, as a middle level power, to make near-Earth space (essentially that spherical volume of space from the Earth to the Moon) safe and secure for human activity.

A further complicating factor is the profoundly dual use nature of the space environment and of many space systems. Questions of national security have driven space activities since World War 2 and, although there is presently unprecedented interest in commercial activities in space, the governments of the major space faring nations – the United States, Russia and China – are not likely to allow their perceived national security interests to be subsumed by economic interests in near Earth space where satellites are integral to terrestrial warfare. The creation of the US Space Force, as a fifth arm of the US military is evidence of this point.

Concerted diplomatic efforts in multi-lateral fora and in bilateral meetings, especially with the world's major spacefaring nations, would seem to offer the most immediate and practical means of encouraging space faring nations to behave responsibly within the space commons. A first objective might be to establish global mechanisms to share data about the threats posed by the natural environment of space (such as space weather) as well as by human activity in space (such as the increasing risk of collisions risks between satellites and space debris) that may come to jeopardise the safe operations of the satellites on which humanity has come to depend so heavily.

Tyvak offers two suggestions:

- We encourage the drafters of the legislation to refer to the challenges of regulating space and of ensuring that it remains capable of supporting human activities safely and securely. Such an acknowledgement we argue would provide a useful contribution to the broader exercise of lifting the level of understanding about space within Government and the broader community as well.
- Outside of the legislation, we encourage Government to increase the funding allocated to research and development of concepts and technologies that add to the resilience and redundancy of space systems or that may serve as alternatives to some of these systems.

Space and Cyber

Beyond expanding the number of sectors designated as elements of Australia's critical infrastructure, the Consultation Paper proposes a Positive Security Obligation under which some entities will be designated as Systems of National Significance (SONS).

Enhanced cyber security obligations are proposed for SONS, to strengthen their resilience and resistance to cyber attack. These obligations will be regulated by the Department of Home Affairs, we presume through the Australian Cyber Security Centre (ACSC). Whether elements of the space sector will be designated as SONS remains to be seen. However, and as noted already, key elements of space critical infrastructure are not within the capacity of Australia to regulate which leads to questions about how the proposed cyber security obligations might be characterised and, if necessary, enforced.

Tyvak offers two suggestions:

- That the legislation focuses on the security of systems and networks rather than on individual nodes and states relevant international cyber security standards and accreditation requirements that system and network nodes that do fall within Australian domestic jurisdiction, are expected to meet. Compliance should be mandated only where Government is prepared to invest in enforcement mechanisms that may include penalties for non-compliance.
- Appropriate international cyber security compliance standards be mandated for all Australian registered space objects and ground infrastructure.

Critical Space Infrastructure and Sovereign Capability

A decision facing Australia is the extent to which the nation should, perhaps even must, invest in sovereign space capabilities. Historically, Tyvak observes that Australia has been largely content to use the services and to take the data provided by others – notably the United States. The exception has been in satellite communications where both Optus and NBN operate capable communications satellites in GEO.

The Department of Home Affairs, through the Critical Infrastructure Group has a vital role in defining the risks that are a function of the nation's current dependence on others. Other parts of Government then have the task of figuring out what to do; where, when and in what to invest and making assessments of the opportunity costs as well.

Tyvak's view is that the real opportunities for Australia in terms of new jobs and value for money lie more in applications than they do in spacecraft themselves which can now be purchased more or less 'off-the-shelf', including from Tyvak. We are committed to establishing an integration facility in Australia, to build sustainable sovereign capability, to service the local market and to support a global 'follow-the-sun' business model with our established facilities in the US and Italy.

The Dependencies of other Critical Infrastructure on the Space Sector.

As noted above, much of the space infrastructure on which Australia has critical dependencies is owned and operated by non-Australian entities. One of the most obvious examples is the US operated Global Positioning System (GPS) which is effectively an extremely accurate global clock, funded by the US taxpayer. By default GPS has become a global utility. Other nations, including Russia, China, Europe (as a whole), Japan, India and the UK post-Brexit, possess or are developing similar systems such is their importance and criticality. We argue that sovereign ownership of satellites may not lead to any substantial improvement in resilience because of the nature of the space domain itself which is an increasingly contested global commons.

As a middle power, closely allied to the United States, Australia’s most effective investments might be in developing national Space Domain Awareness systems, data from which can:

- Inform national policy and Australia’s space diplomacy; and
- Contribute to allied SDA systems.

Ultimately, Australia needs to have sufficient sovereign awareness and understanding of human activities in near Earth space to be able to strengthen the normative framework, the customary law in effect, that has evolved since the launch of Sputnik in 1957 and that is mostly carefully followed by the space faring nations.

Conclusion

Tyvak is strongly supportive of the inclusion of space activities as an element of Australia’s critical infrastructure. However, we encourage Government to acknowledge that much of the infrastructure is beyond the capacity of the Australian domestic law to regulate. Australia’s middle power status and strategic geography provide it with options to positively contribute to global understanding of the near space environment. Understanding is a vital first step to sustainable management in a commons that is increasingly crowded and contested. And management is an important step towards increased resilience.

A well-informed public debate, coupled with careful and equally well-informed diplomacy would seem to be important early steps in building national resilience in the space sector with positive impacts across all other critical infrastructure sectors.

Satellites depend on strong cyber security for their safe and effective operation and the Australian Government is encouraged to ensure that data and services from satellites on which Australia’s critical infrastructure depends conform to best practice cyber security policies and procedures going forward.

Tyvak is committed to assist the Australian Government in such efforts.



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