



15 December 2016

Committee Secretary
Senate Standing Committees on Rural and Regional Affairs and Transport
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Parliament House
Canberra ACT 2600
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Dear Senators,

Senate committee inquiry into regulatory requirements that impact on the safe use of Remotely Piloted Aircraft Systems (RPAS), Unmanned Aerial Systems (UAS) and associated systems.

Telstra welcomes the opportunity to comment on the Senate inquiry into “*regulatory requirements that impact on the safe commercial and recreational use of Remotely Piloted Aircraft Systems (RPAS), Unmanned Aerial Systems (UAS) and associated systems.*” At the outset, we commend the Civil Aviation Safety Authority (CASA) on the recent amendments to Part 101 of the Civil Aviation Safety Regulations 1998 (Cth) which have set the right foundation for the future RPAS regulatory framework. Safe integration of drones¹ into the national airspace is important for the future prosperity of Australia and we thank the Committee for applying its resources to this important topic.

Telstra is already embracing drone technology

Telstra is a leading telecommunications and technology company with a growing international business, and a heritage that is proudly Australian. Our mobile network is Australia's largest, supported by more than 8,000 mobile network sites across the country, in terrain that varies from densely populated cities to coastal towns, the outback and rugged bushland.

We have a strong interest in the opportunities created by drones. We are actively exploring the efficiency, cost reduction and safety benefits that drones can bring to our business, our customers and the wider community. Here are some examples of our current work with drone technology:

- Using drones as our ‘eyes in the sky’ to inspect our mobile towers. Currently we have eleven licensed pilots across five zones nationwide. The efficiencies introduced by using drone technology are especially important during times of natural disaster when re-establishing communication quickly is of vital importance for disaster recovery operations.
- We have recently entered into an agreement with Boeing in support of Queensland Government's Advance Queensland Project to undertake a major research project aimed at enabling the safe and reliable operation of drone technologies for Beyond Visual Line of Sight operations (BVLOS).
- We are working with Little Ripper Lifesaver to research the use of drones in Search and Rescue (SAR) operations and live streaming of these activities using our mobile network.

¹ The term drones is used throughout this submission to represent Remotely Piloted Aircraft Systems (RPAS), Unmanned Aerial Systems (UAS) and associated systems



Considering the above, and the importance of network connectivity to the evolution of drone technology, we believe Telstra is well placed to contribute to the matters being considered in this inquiry. Our submission focuses on creating a safe environment for the wider deployment of drones through the use of a combination of smart drone technologies, mobile networks and drone traffic management systems.

There are many benefits associated with the emerging drone industry

Consumer and business interest in the drone industry is growing rapidly in Australia and across the world. Increasingly, consumers are buying and using drones due to factors such as price declines, high levels of awareness and ease of use. Drones are already transforming entire industries. Some of the existing and emerging uses include taking aerial photos for real estate purposes, inspecting infrastructure such as gas and water pipelines, rural bridges, fencing and telecommunications transmission towers, road accident investigations and police operations. Drones come in all shapes and sizes, ranging from ones that can fit into the palm of your hand to large fixed-wing crafts that look and behave much like aeroplanes. Drones are tackling jobs that were previously impossible or difficult, and they are reducing the cost and the risk of many dull, dirty or dangerous jobs.

The economic impact of drones is currently defined in terms of projected hardware sales and potential value of replaced goods and services. For example, Goldman Sachs estimates the total global spending on drones across recreational, military, enterprise and civil segments at in excess of US\$100B between now and 2020 (FY2016-FY2020)². While this is an impressive figure, it does not take into account the downstream and indirect economic benefits on health, agriculture, disaster relief, entertainment & media, small business, employee safety, parcel and postage services etc. These are inherently unquantifiable at this stage, given the incipient nature of the industry. As various use cases evolve, develop and mature, they are likely to unlock economic and non-economic value that is currently unforeseen.

The benefits of drone technology need to be safely unlocked

We believe it is important for Australia to capture the full potential of these benefits by promoting an environment in which Australian industry can be a global leader in the innovation and application of drone technology.

We welcome the recent amendments to Part 101 of the Civil Aviation Safety Regulations 1998 (Cth) which we think has set the right foundation for the future regulatory framework. However, in order for Australia to harness the full benefits of drone technology, we believe an even more progressive regulatory framework will be required. We also understand concerns about safety, security, and privacy and believe they are very important factors, especially as drones become more prolific. We believe the smart use of drone technology together with mobile network connectivity and traffic management systems can help address many of these concerns while also minimising the regulatory burden on drone users. Modern mobile networks are well placed to provide a convenient, cost effective, reliable and secure way of communicating with drones. Such an environment also opens up the opportunity for more complex operations such as those involving BVLOS, multiple drones controlled by a single pilot, and night flying.

Due to regulatory restrictions, drone flights are limited to visual line of sight, unless an exemption is granted by CASA. Based on our experiences we believe that safe use of drones

² Goldman Sachs Equity Research, 13 March 2016: <http://www.goldmansachs.com/our-thinking/technology-driving-innovation/drones/index.html>



BVLOS is the key to unlocking many of the potential benefits associated with drones. For example, using a drone for shark surveillance would deliver the greatest benefit to the community if it could be flown BVLOS. Another area where flying drones BVLOS is necessary for success is the enablement of disaster response and restoration in situations where it is not always possible or safe for a user to be close enough to maintain visual line of sight (e.g., bush fires or chemical spills). In our line of work, BVLOS would allow us to more efficiently assess damage to mobile network towers and other infrastructure during disaster situations when the infrastructure is not accessible by vehicle.

While we are a strong proponent of moving towards BVLOS, and multiple drones per pilot, we also value the community's right to safety and privacy. We believe a sensible set of regulations, combined with a UAV Traffic Management System and base level of drone onboard safety and airspace management capabilities can go hand in hand to address these concerns.

Drone technology is also being used to enhance safety

Most drones already have built-in smart drone technologies that help to prevent accidents in the event of communications disruption. For example, frequency hopping communications systems prevent unintentional or malicious signal jamming. 'Go home' or auto-hover features are commonly available that autonomously pilot the drone in the event of signal loss. Geo-fencing, a technology that uses GPS location signals can create virtual 'no-go' zones - either around drones themselves or in protected airspace associated with airports and professional sports events.

More advanced technologies are in the pipeline, including NASA's UAS Traffic Management (UTM) project that could safely enable low-altitude airspace and UAS operations. We see connectivity being an important ingredient in enabling the advances made towards safe integration of drones into the national airspace. Mobile networks can be used to extend the control range of drones to wherever there is coverage – beyond visual line of sight. In addition to this:

- Mobile networks have the potential to allow drones to deliver sensor data for processing, analysis and decision-making mid-flight and to receive command-and-control inputs in real-time, resulting in a safer, more reliable shared airspace.
- Mobile networks are well placed to become an enabler of a centralised UTM system. By providing a reliable and ubiquitous communications platform for exchange of information, a mobile network could potentially allow drones to be contextually aware of civil aircraft and/or other drones around the common airspace in near real-time.
- Mobile networks would assist national security and law enforcement agencies to identify and monitor drones that may be of interest, by enabling the near real-time recording of drone flight information in a UTM.
- Mobile connectivity would allow the dynamic application of airspace safety technologies such as geo-fencing.
- Mobile Subscriber Identity Module (SIM) technology could be used to create a secure register of drones and provide traceability to owners – drones would need to have an active registration before they could fly.
- Finally, compared to alternative wireless solutions that operate in open access radiofrequency spectrum, mobile networks offer a more reliable communications environment for drones. This is because there is a risk of interference between wireless devices that share open access spectrum, which limits the quality of service that can be offered. Mobile networks are not subject to this type of interference risk as they use spectrum which is exclusively licensed to them and not shared with other users.



In the case of Telstra, the reliability of mobile network connectivity for mission critical applications can also be enhanced through the use of the Telstra LANES[®] Enterprise³ and Telstra LANES[®] Emergency⁴ service offerings. Telstra's standard mobile broadband service is designed to provide a high level of performance and security, but the Telstra LANES[®] Enterprise and Telstra LANES[®] Emergency services take this even further by prioritising the network traffic associated with these services.

There are a number of US, European and even Australian organisations that are racing to define the UTM technology ecosystem. NASA, CSIRO, Verizon, Google, Amazon, are all working towards developing UTM systems to enable safe operation of unmanned aircraft in airspace. Such companies are seeking to leverage mobile networks and technologies such as Automatic Dependent Surveillance – Broadcast (ADS-B) transponders, for airspace management, obstacle avoidance and collision avoidance.

Precision Hawk is a US UTM operator which recently received its grant to operate BVLOS. We see this as an important step towards enabling BVLOS and we are keen to work with CASA and other stakeholders to promote local BVLOS research in Australia.

The regulatory framework for drones should be grounded in best practice

As explained above, we believe that a combination of smart drone technology, mobile network connectivity and drone traffic management systems is the best long term approach to creating a safe environment for the large scale deployment of drones in Australia. The number and use of drones is growing rapidly so we think Australia needs to move quickly towards adopting this approach and a suitable regulatory framework needs to be urgently developed to support it. We envisage this framework involving a combination of regulations, technology standards, and educational material for the suppliers and users of drones. The framework should be based on a best practice approach whereby a clear problem statement, identification of options and cost/benefit analysis are undertaken to establish whether Government legislation and regulation is necessary to address problems that are unlikely to be solved through commercial or industry solutions, and to whether the benefits of any such intervention outweigh the costs. We also believe the risks associated with implementing this new framework are best managed by taking a graduated approach, i.e., commence with controlled trials, followed by implementation in less populous areas, and then expanding to cover areas with higher population densities.

It is also important that Australia is aligned as much as possible with international frameworks so that it can take advantage of equipment and systems that are supplied on a global scale and thus minimise the cost for users to specifically comply with the Australian framework. Currently, the International Civil Aviation Organisation (ICAO) has no existing standards or recommended practices for drones. We think there is an opportunity for Australia to take a leadership role in ICAO, and in other international organisations such as Joint Authorities for Rule making on Unmanned Aircraft Systems (JARUS), to help shape and drive a harmonised international framework for drone regulation that is consistent with our national interest.

We also think there is opportunity for some immediate reforms within the current framework, while the longer term framework is developed. Given recent developments in safety technology for drones, we believe the restriction on BVLOS operations could be relaxed for certain applications such as emergency situations or the inspection of agriculture, utilities, and

³ See <https://www.telstra.com.au/business-enterprise/industries/mining-and-resources/telstra-lanes>

⁴ See <https://www.telstra.com.au/business-enterprise/industries/public-safety/lanes-emergency>



oil and gas pipeline resources in areas of low population density. In all of these situations there is little risk of harm being caused to people or property but the benefit of being able to cover longer distances would be substantial. In addition, we believe the requirements for a one-to-one drone to pilot ratio could be relaxed in these types of situations, as long as autopilot functionality is available. Drones are currently flown using autopilot functionality, but must have a pilot on hand to take over. Finally, providing a framework for trialling certain drone operations and a clear and expeditious exemption granting regime would also be of great importance. We also note that other countries such as Canada and New Zealand are more progressed with their regulatory framework for enabling BVLOS operations although with certain conditions attached.

An industry forum should be establish to develop the new regulatory framework

We acknowledge that it is CASA's responsibility to ensure that all aircraft are operated safely. However, it is also important that Australian industry is at the forefront of this new technology and able to reap its full potential. Therefore, we believe industry and CASA need to work together collaboratively to determine a suitable regulatory framework for the safe use of drones on a large scale in the Australian airspace and without stifling enthusiasm or innovation.

We recommend the Senate Committee seeks the establishment of a forum chaired by CASA, with membership from suppliers and commercial users of drones, to develop this framework. The Terms of Reference (ToR) could request a report on the regulations, technology and UTMS standards, and educational resources that will be required to enable the widespread and safe use of drones in the future through the use of smart drone technologies, mobile networks and drone traffic management systems. The new framework should include specific consideration of operations involving BVLOS, multiple drones per operator, and night flying. The ToR could include a tight but realistic timetable to avoid delaying the benefits of this reform for Australia.

We appreciate that CASA already runs a UAS standards sub-committee which is a joint CASA/aviation community forum for the development of regulations and standards pertaining to UAS. However, we believe a new forum with a clearly defined ToR and timetable to focus on developing and implementing the future regulatory roadmap is likely to be a more effective approach.

Closing comments

We are interested in participating in the hearing of the inquiry proposed for March 2017, including the opportunity to demonstrate how our mobile network capability, coupled with new drone technologies, can assist with the safe future deployment of drones in Australia. Please don't hesitate to contact Brian Miller on (03) 8649 5953 or by email at Brian.Miller@team.telstra.com if you have any queries about our comments in this submission.

Yours sincerely,

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