

FUTURE MOBILITY – PLANNING FOR INFRASTRUCTURE REQUIREMENTS

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Good afternoon all, and thank you to Caroline and the team at the AA for inviting Airservices to speak today.

Before I turn to the topic of the day, planning for the future of mobility in Australia, I wanted to briefly take a look back in time....

****SLIDE****

A hundred years ago a revolution began in Australian aviation.... And it started small...

In November 1919 a dusty paddock near Sydney's Botany Bay was officially converted into Mascot Aerodrome. This paddock would, of course, go on to become Sydney's Kingsford Smith Airport... an airport that is now ranked amongst the top 25 airports on the planet and welcomes an incredible 44 million passengers each year.

A year later, in November 1920, two young airmen who were home from the war in Palestine, would sign papers at the Gresham Hotel in Brisbane with a local grazier to establish an aerial postal service. This local business would, of course, go on to become Australia's Qantas, today one of the world's premier airlines.

We may be tempted to ask... who could ever have imagined how much aviation would expand, inspire and transform Australia? Those early aviation pioneers dreamed big. They may not have known what the future would look like, but they knew they were ready to make change happen and they worked tirelessly to achieve their vision.

The emergence of new airspace users presents us with the next transformational opportunity for aviation in Australia. And, of course, the dramatic growth in new airspace users will be attributed to many different types of unmanned and manned aerial vehicles... let's just collectively call these vehicles drones for now...

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Drones are here, they are developing rapidly, and they are becoming a regular feature of Australian airspace at an ever increasing rate.

Today we are just at the beginning of this particular flying revolution. And even though it is early days, we know that drones have the potential to significantly transform many aspects of our economy, and society, very much for the better.

The real question for us is: how can we, Australia's aviation industry, work together to keep Australia at the forefront of global aviation? And, in particular for today, I wanted us to turn our minds to the role that Australia's airports could, or perhaps should, play in that future?

We are all aware of the many use cases for drones...

They are already a feature of the mining industry, where they are used to simplify the creation of stockpile reports... or to assist in drill and blast planning... or monitor and inspect buildings and equipment.

In agriculture, too, progress is happening rapidly. Precision farming will be made even more precise by drone-based multispectral sensors that can map and manage the health of crops remotely... quickly and efficiently informing decisions on irrigation management.

From medical services to home-shopping... From law enforcement to industrial uses... and rapidly changing urban air mobility as it relates to the future of passenger transport ... And of course there is no doubt that there are plenty of dreamers out there already planning the new enterprises that will deploy drones to commercial and national advantage that no one has even thought of yet...

Currently, it is estimated that there are somewhere between 250,000 and over one million drones operating in Australia. More importantly, drones are rapidly moving from hobbies to businesses. As of today, CASA has issued nearly 14,000 remote pilot licences AND a whopping 1,728 RPA operator certificates for commercial drone use.

To put this into perspective, according to CASA, the number of unmanned aircraft operator certificates for commercial use is already nearly double the number of manned air operator certificates.

Drones and the like are a fantastic example of what is known as exponential technology – something that doubles its capability or performance in a specified time period. Drones have actually been around for a number of decades, but the doubling effect has just hit critical mass now. We're at the point where the capability is mature enough – and the price point accessible enough – to bring drone technology into mainstream commercial and consumer applications.

The Australian Government recognises the big opportunities drone technology has to offer and is developing a policy for how drones will operate into the future. As a nation we have many assets which we can exploit to be a world leader in drone aviation today, just as we were a leader in the introduction of modern passenger aircraft services a hundred years ago. Big distances within our country provide an incentive for air transport innovation. We have great flying conditions, high quality governance standards, and an excellent safety record.

Now let me briefly turn to the role of Airservices...

Airservices is very proudly a key component of our high-quality aviation safety ecosystem here in Australia. We are responsible for ensuring the safety of ALL airspace users in ALL airspace in an area that covers 11 per cent of the globe... We do this today through the provision of aviation communications, aeronautical data, navigation services, air traffic services and aviation rescue and fire-fighting services.

Right now, working together with Defence, we are building a world-leading unified civil and military air traffic management system, known as OneSKY. This is next generation

technology that will drive a whole range of technical advances, safety and security improvements, and will underpin traffic growth in Australia for years and years to come.

In relation to drones, Airservices is working closely with our Government colleagues in the Department of Infrastructure (who are setting the policy direction on drones); with CASA, Defence and other relevant agencies on our preparatory work for the future... We are also, of course, working closely with our airline customers and key industry partners, including Australia's airports. Creating a strong and durable alignment between government and industry will be essential to ensure that we, as an industry, can fully anticipate, plan for, respond to and shape Australian aviation for the next 100 years...

Airservices is working on three priority areas right now to prepare for this new world.

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The first priority is the essential task of airspace boundary integration – protecting today's airspace users.

This has involved Airservices, in partnership with CASA and Defence, installing and commissioning passive drone detection systems across all civil aerodromes that have an air traffic control service here in Australia. That is 29 airports and given this scale, we believe this is a world-first operation that provides a national drone detection capability across the country. We will continue to build on this capability over the next 12 months.

We have almost completed the installation of the equipment at these locations and are now focussed on establishing a real time monitoring capability. This will allow active monitoring of drones and see us refine protocols in response to a drone detection, in collaboration with the regulator, the airports and law enforcement.

Once that is done, we will explore options for the integration of our detection and monitoring capability into today's air traffic management system.

The second priority area for us is the development of new information based traffic management services and systems that support the exchange of information between

unmanned aircraft systems to ensure the safe passage of multiple aircraft through shared airspace.

The third priority is to develop a better understanding of this future industry through broad engagement with industry participants, targeted research and economic modelling. One example of this is a project we are working on to model how particular piece of lower level airspace can be designed to safely integrate drones for current use cases and, then potentially, for future use at scale. Of course this will be in consultation with the relevant airports, and be in consideration of future master planning and community consultation processes. By developing a better understanding of the possibilities that could unfold over the next ten to twenty years, all of us in today's Australian aviation industry will be more prepared to deal with the opportunities and threats that will be presented to us.

At Airservices, we are proactively and collaboratively getting ready for the long term future where comprehensive integration of drones into today's air traffic management network will be a necessity.

I now just want to touch on some of the more recent developments in our sector... Whilst we grapple with planning for these developments today we MUST also consider the future implications for the aviation industry and more broadly, the transport and logistics value chain.

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This year, as I am sure you are all aware, Melbourne was selected as one of three global cities to play host to tests of Uber Air's aerial taxi service. There are plenty of sceptics out there about this, but given the amazing history of aviation so far, I think we would all be wise to assume that at some point the technology and business case will come together to make this aerial taxi idea -- or something like it -- a reality.

Right now Boeing is offering prize money to developers who can create safe, quiet, compact, vertical take-off and landing devices. One review of this year's short list of competitors

noted that prototype looked like everything from a flying Segway to a part-drone, part-tilt rotor motorcycle!¹

We've all heard about delivery drones. Google has launched a world-first commercial drone business and Google Wing has already launched a commercial air delivery business in Canberra, delivering goods and equipment by drone directly to homes.

There's also a new generation of cargo drones in development that offer commercial aircraft-sized autonomous delivery. These aren't small aircraft, they are substantial flying cargo containers. They are fast, environmentally friendly, and could completely change the cargo industry.

Just last month, research firm Gartner released a report predicting that these autonomous devices will become increasingly "smarter", through artificial intelligence and machine learning... their behaviours will become more advanced, which will enable them to interact more naturally with their surroundings and with people. In fact, the report listed this as one of the Top Ten Strategic Technology Trends to watch in 2020, stating that:

"As the technology capability improves, regulation permits and social acceptance grows, autonomous things will increasingly be deployed in public spaces that are uncontrolled today."

In the not-so-distant future, we may see a scenario where an autonomous cargo plane moves goods to the required destination, then robots or drones would be deployed from the plane to make the final delivery of the package, direct to the door of the purchaser.

So there's a race to get to the skies first with the best business models and the right mix of product and customer focus.

¹ <https://newatlas.com/boeing-gofly-winners-phase-ii/59037/>

In a report earlier this year, Morgan Stanley estimated that autonomous urban aircraft could become a \$1.5 trillion industry by 2040. That included everything from vertical take-off and landing aircraft, flying taxis, military unmanned aerial vehicles, and delivery drones.²

However, there are many challenges that will need to be overcome before we will have a new urban air mobility ecosystem. One of the biggest challenges relates to infrastructure. While much focus has been on the development of new vehicles to enter this space, there has not been the same focus on the supporting infrastructure that will be required to enable the operating environment. Ground infrastructure, robust communication and surveillance systems, and data platform solutions that enable seamless information exchange are all required if we are to make this future a reality.

And where do Australia's airports, large and small, fit in to this picture?

Well obviously their future role is key in managing the integration of new and existing airspace users.

All of the potential future use cases I previously outlined will have the need to operate in and around an airport, to integrate with existing aviation users. The new industry players are already conceptualizing designs for ground infrastructure fit for residential buildings, highway plazas, parking areas, and skyports on rooftops of high-rise commercial buildings. How these designs and standards work in and around the airport, and airspace boundaries, will require comprehensive assessment and long term thinking.

Given both limited urban space and ever increasing real estate prices, establishing spaces large enough to build multiple landing areas will often not be possible. This will mean we need to consider different landing-pad configurations and we need to be careful to ensure this contemplates long term requirements and the complexity that is likely to eventuate as these new airspace use cases grow.

One important factor to take into account is that, with the exception of defence applications, the realisation of the full economic and social potential of drones will be commercially

² <https://www.morganstanley.com/ideas/autonomous-aircraft>

driven. It will be up to the private sector to lead the many complex assessments of commercial viability (and take the risks) for all the potential services that will soon become technically possible.

Airports can take opportunity from this aviation revolution and they start with big advantages in this complex decision-making process.

Airports are the focal points of existing transport and distribution networks. They have the maintenance and certification facilities that will be required. They have experience in gaining community support, and they are already recognised and appreciated as huge job creators and business and commercial hubs. In the recent Skytrax survey six Australian airports ranked in the top 100 in the world- we have real expertise as a nation in running successful airports.

But these advantages are not guarantees for the future. If airports are too slow to provide what is needed for this next wave of aviation activity, or too demanding of their potential partners, then I suspect other solutions will be found to accommodate the era of drones.

There is a need right now for long term thinking and infrastructure planning for drone operations at airports. This may include hanger space, integration into flight operations, cargo transits, passenger management, and community consultation. Then there are the questions of landing pads, aerial device parking arrangements, changes to security processes and the impact on airport car parking and retail demand.

The time is now for airports to think towards a very different and disrupted future. None of us knows exactly what the future will hold. It is quite possible that drones will open up new competitive pressures, both between airports themselves, and between airports and newly developed facilities near airports that we can now barely imagine.

So, let me conclude.

Standard air traffic is forecast to double over the next ten to fifteen years. Add drones to the mix and we have a very complex period ahead of us.

Such a pressing and open-ended wave of change will test all of us in this industry. My message today is that Australia can again be a world leader in the take-up of the amazing opportunities aviation offers our nation.

To facilitate and enable these exciting new technologies that promise to radically transform the way we live and work will require innovative thinking and partnerships.

We need to work together, be forward thinking and constantly challenge the assumptions we make of what our environment will look like tomorrow if Australia is to stay at the forefront of this exciting new world.

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I was fortunate to recently attend the Australian Summit for Singularity University. It was two days of thought provoking presentations that described a world that is very different to the one we live in today... a world where the pace of change continues to increase exponentially through leveraging technology to solve today's problems differently...

Many critical industries were canvassed – healthcare, utilities, education, agriculture... and of course all are changing as rapidly as ours... This quote particularly resonated with me... I'm willing to bet that many of those who saw this early sketch of the very first glider thought the Wright Brothers were more than a bit crazy – and look where we've ended up today!

At Airservices we are working hard to prepare for the future of Australia's aviation industry.

We recognise the potential benefits of growth in this industry for all Australians, from the biggest cities to small rural and regional communities.

We know that managing the complex transformation of Australia's airspace is going to be challenging but we are taking a proactive approach to responding to this challenge over the coming years.

I have no doubt that we can do this. Together this industry can set a course for the next one hundred years of Australian aviation achievements.

Thankyou!