



Emerging Aviation Technologies

Submission to the National Aviation Policy Issues Paper

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L.E.K.

1. INTRODUCTION

L.E.K. welcomes the initiative that the Department of Infrastructure, Transport Regional Development and Communications (DITRDC) has taken to prepare a National Emerging Aviation Technologies Policy Issues Paper on emerging aviation technologies. L.E.K. agrees with the potential opportunities that the sector brings to Australia, and the need to develop a comprehensive national policy. As well as the importance of a proactive and coordinated approach, that provides clarity to industry participants and creates an even playing field.

This submission details L.E.K.'s perspectives on the following 4 areas:

- Proposed core principles
- Government's roles and responsibilities
- Opportunities
- Barriers and actions

The focus of this submission is on the advanced aerial mobility (AAM) industry. However, many of the recommendations in this paper will be relevant to drones as well as for AAM.

2. PROPOSED CORE PRINCIPLES

The core principles articulated in the issues paper are relevant and critical to building a sustainable and safe industry. In addition to those listed, there are two further themes that should be considered.

Local industry and wider ecosystem development

In addition to supporting growth and investment in the AAM industry. It will be important to consider the wider ecosystem that the AAM industry will operate within. Supporting industries including advanced manufacturing, technology and R&D stand to benefit significantly from investment in the AAM industry. Realising these benefits will be key to maximising the economic development outcomes.

To do this the National Emerging Aviation Technologies Policy will need to:

- Support local industries to participate in the AAM industry supply chain
- Support the development of a skilled local workforce to support the industry and local supply chain
- Encourage partnerships between universities and businesses in the digital, telecommunication, and transport sectors
- Develop mechanisms to enable industry and governments (State and Commonwealth) to work together

Technology agnosticism

Globally there are over 200 different eVTOL manufacturers, with c. 15 aircraft currently undergoing certification with the Federal Aviation Administration (FAA). These aircraft have novel airframe designs and different types of propulsion technology. Also, eVTOL operators are focused on different market segments and are adopting unique go-to-market operating models.

In addition to the 'market management approaches' listed within the 'Core Principles', it will be important to take a technology agnostic approach. Practically, this means that policies and regulation should be developed in such a way to support all industry participants, regardless of their underlying technology.

3. GOVERNMENT'S ROLE AND RESPONSIBILITIES

L.E.K. commends the commitment to adopting a co-ordinated and consistent approach across all states. In other industries, such as rail, a fragmented approach to regulation and standards development can result in inefficiency and sub-scale markets that deter and inhibit investment and innovation. It is important to have simple, consistent standards across jurisdictions that minimise duplication of effort, and support the development of a nationwide AAM industry. A comprehensive national policy should:

Establish a consistent and co-ordinated approach across all levels of government

There are a number of areas where government involvement could enable the development of the AAM industry, or indeed where inaction could obstruct progress. It is important, as previously discussed, to have strong Commonwealth leadership to ensure a consistent and co-ordinated approach across the country. As well as to agree a unified approach towards airspace management, safety, security, privacy and environmental impact.

However, the role of state should not be underestimated. The state departments and agencies will need to be heavily involved in many critical areas of industry development including, but not limited to:

- Selection and permitting of Vertiport sites and approval of designs
- Administering and enforcing policy and regulations relating to noise levels on the ground, other environmental impacts of AAM operation and privacy issues relating to overlooking over private property

They will also need to work with industry and local government to build the social licence to operate. As a result, co-ordination between all levels of government will be essential. Pro-active engagement between relevant agencies at a local, state and Commonwealth level will be necessary to establish consistent policies and regulations.

As well as a clear lead agency at the Commonwealth level, there should be a lead agency in each State. This is important given that many considerations around industry development will be locally driven. This lead State agency should be empowered to partner with industry participants, working through the critical areas identified above – with clear delineation of roles and responsibilities between the state and Commonwealth.

Provide regulatory clarity and certainty

Regulatory risk is a major concern for AAM industry participants. Regulatory certainty is therefore an essential criterion for market participants when selecting which international jurisdictions to invest in. In practice, this means providing confidence in the government's intent, and clarity about the regulatory play book. The Commonwealth can support the development of the AAM industry in Australia through a series of relatively simple steps. The Government should establish and publish clear guidance on how it expects the AAM industry in Australia to develop, and what it will do – and also what it won't do – to support the industry. This will ensure expectations are clear, and provide certainty to participants who potentially want to invest.

Move quickly to capitalise on the AAM opportunity

The AAM industry is developing quickly and is on the cusp of commercialisation. Uber Air, EHang, Volocopter, and Lilium have signalled their intent to launch commercial passenger operations within the next 5 years. Commercial proponents are well backed and have global ambitions. In 2020 alone, there has been over a billion dollars invested in the industry.

AAM could evolve to become a substantial industry in Australia. Some states are already viewed favourably by the international AAM community as a potential early launch location. Uber has selected Victoria as a first test site and Wing has deployed its drone deliveries in ACT and NSW. Combined these place Australia in a strong international position as an early launch jurisdiction.

However, other jurisdictions are also moving quickly. The US, Singapore, South Korea, Germany and New Zealand have all launched national programs to accelerate AAM. At the city level, Munich, Vancouver, Dubai and Guangzhou are developing local technologies or engaging in partnerships to enable international expansion from existing primary testing and development sites. It is important that the Commonwealth and state governments continue to pro-actively engage and enable the development of the industry within Australia. Action taken by the New South Wales and Queensland Governments to partner with industry proponents and establish designated testing facilities for eVTOL and drones respectively, are strong positive steps and should be followed up to further enable to pathways to commercialisation.

4. OPPORTUNITIES

The development of an AAM industry in Australia brings a number of opportunities. In addition to delivering transport benefits, by reducing travel times and increasing reliability for freight and passengers, and supporting the decarbonisation of the transport fleet - It also offers significant industry development and regional connectivity benefits.

The industry also presents a number of additional opportunities for Australia. The National Emerging Aviation Technologies Policy should capitalise on the following opportunities.

Attract foreign investment

AAM is expected to transform the aviation industry. Once at scale, the industry will become a material part of the Australian aviation industry. As a new and growing industry, it presents an opportunity to attract foreign direct investment, and support economic growth. The establishment of the AAM industry will also create a variety of operational and support industry employment jobs. Many of those jobs will require similar skills to those currently used in the aviation industry.

Capture broader ecosystem employment opportunities

In addition, to direct employment opportunities, the AAM industry will create jobs in the broader ecosystem, in areas such as advanced manufacturing, smart city transport infrastructure and research and development.

To maximise the wider economic benefits, it will be important for Government to take a key role in facilitating the industry's development. This could be through a range of mechanisms, including direct engagement with adjacent industries or supporting local R&D. As the industry grows, the Government could have a role in facilitating connections across all parts of the value chain to provide access to talent and connecting participants.

Build a reputation globally as a leading innovator

Participation in the AAM industry gives Australia a seat at the table of the global AAM conversation - allowing us to lead policy setting in a way that benefits Australians. It will also build Australia's brand and reputation for innovation. As well as increasing the attractiveness of Australia for technology investment in other industries.

Connect regions with relatively less capital investment

Connecting regions is becoming increasingly important. COVID-19 is driving decentralisation, as employers adopt remote working models.

AAM has the potential to transform the way we travel to and from our regional centres. Enhancing connectivity between regional hubs and urban centres. Driving significant benefits to the economy, as well as improving access to employment, health care, education, and services for communities across Australia. It will increase the attractiveness of regional areas for investment by other industries, increased tourism and attendance of regional special events.

The capital cost of building new roads or developing high speed rail connectivity between regional and urban centres can be significant. AAM could be a more cost-effective method of providing high speed connectivity for some city pairs. Especially where the cost and complication of scaling general aviation, or constructing fixed infrastructure, do not justify the likely patronage demand.

Because AAM does not require significant and complex infrastructure, it is relatively quicker to establish and faster to scale than road and rail networks. Furthermore, the interconnected hub style nature of future AAM networks means that just a handful of Vertiports creates numerous routes. It is also easier to scale over time and match demand. Enabling smaller communities to be connected, and providing greater flexibility than fixed infrastructure alternatives.

5. BARRIERS & ACTIONS

There are a number of barriers to the development of the AAM industry, many of which are listed in the issues paper. In addition to this we recommend that careful consideration is given to the barriers that most directly impact the commercial attractiveness of the AAM industry. The following key drivers of commercial attractiveness need to be considered in the final policy position.

Supporting network scale

As with many industries, the economics of AAM flight improve considerably with scale. Fixed overhead costs can be amortised across a larger transport task. Specifically, for AAM operations, as the number of nodes in the network grows, the number of potential operating routes grows non-linearly to accommodate scaled demand. Initially, when the network has a few vertiports, there is a low share of trips that can be completed using one of the available routes; however, as nodes are added, connectivity improves. Even if nodes added later have relatively low traffic, there is significant benefit from the connection to existing nodes, and associated network effects. This has flow on effects to utilisation and the ability to deliver a cost per passenger km.

To sustain and support the industry it will be important that industry proponents can enter into the market and scale easily. Practically this will mean taking the following actions:

- a) Accelerating the development of Vertiport design and construction standards. This will provide certainty to infrastructure investors and owners
- b) Ensuring the process of permitting Vertiports is clear, unambiguous and expedient. So that market participants can confidently plan for growth
- c) Supporting the placement of vertiports next to existing transport hubs or key destinations, to improve the connectivity of our transport networks
- d) Fast-tracking the development of AAM Concept of Operations. By developing UAM corridors, traffic management and separation methodologies to enable greater volumes of eVTOL traffic

Enabling remote pilot capability

The National Emerging Aviation Technologies Policy should clearly distinguish between remote piloting capability and fully autonomous eVTOL operations. As the industry matures, it is expected that it will move towards remote pilot operations, before eventually becoming fully autonomous.

Remote pilot capability provides a key step change in the commercial attractiveness of the AAM industry. It will increase the capacity of the aircraft itself by freeing up the seat taken by a pilot, and reduce the cost to operate, as remote piloting will require significantly less labour. The dual effects of this will significantly improve flight economics.

Given the importance of this to the attractiveness of commercial returns of the AAM industry, consideration to enabling remote pilot capability must be considered in the medium term (horizon 2) in c. 5-15 years.

Winning the social licence to operate

One of the greatest barriers to commercialisation is attaining the social license to operate, and this is a key area where the government can play a part to support the development of the industry. Social licence could be negatively impacted by community concerns around issues such as safety (to both users and the local population), noise, visual amenity, privacy, affordability and accessibility; and these factors, rather than any technical hurdles, may well prove to be the most substantial obstacle to the early development of the industry in Australia.

Winning the social licence to operate AAM will be key to the successful launch of the industry, but there is no single party that can clearly be responsible for achieving this. Ensuring social licence is obtained and maintained will require the collaboration of multiple parties – Commonwealth, state and local governments, regulators, proponents and participants in the broader AAM ecosystem. Through effective collaboration and early, deliberate choices to engage with community concerns, the AAM industry can win the social licence to operate.

Tangible actions from multiple level of Government could include:

- Embedding social licence considerations into every step of the decision making process
- Holding practical demonstrations and proof of concepts to help the public understand what the technology looks and sounds like
- Choosing early use cases with social benefits. Use cases such as patient transport, search and rescue, or critical medical delivery can be used to highlight to the public the ways in which AAM can be beneficial to society as a whole
- Developing a clear, active, and targeted communication strategy

5. CONCLUSION

Whilst there are a number of barriers to overcome to overcome, the development of the AAM industry can deliver significant benefits for all Australians.

L.E.K. appreciates the Department’s proactive stance on developing a comprehensive national policy.

Continued close engagement with industry, and a collaborative approach, with a view to what drives the commercial attractiveness of the industry will be key to supporting the industry going forward.

Thank you for the opportunity to provide feedback. If you have any further questions, please contact

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About L.E.K. Consulting

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