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October 30, 2020

Director, Airspace and Emerging Technologies
Department of Infrastructure, Transport, Regional Development and Communications
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RE: Australian Government's Emerging Aviation Technologies, National Aviation Policy Issues Paper

Thank you for the opportunity to submit comments on the Australian Government's Emerging Aviation Technologies National Aviation Policy Issues Paper. We appreciate the thoughtful consideration of the range of policy issues presented by drones and electric vertical takeoff and landing (eVTOL) aircraft for national government regulators, local authorities and communities and the opportunities that new aviation technologies present to society. We offer these comments to help inform future policy development and areas for research and development.

Uber Elevate's vision is to weave everyday flight into the Uber platform - integrating aviation into existing surface transportation systems to enhance mobility. We plan to offer an aviation product using eVTOL aircraft on the Uber platform, with Melbourne, Australia identified as our first international launch city outside of the United States.

We look forward to supporting the Australian government's approach to integrating new users into the airspace system to facilitate the adoption of these innovative aviation technologies that will improve urban and regional mobility.

National government role as regulator and facilitator

The paper acknowledges, and we agree, that in planning to achieve the scale of future drone and UAM operations and to provide the necessary air navigation services, a high degree of collaboration is necessary between aviation regulators and industry. Government-industry partnerships will define new certification and safety oversight requirements as well as traffic management services. We support a globally harmonized approach to certification, safety oversight as well as UAS Traffic Management (UTM)

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that will enable civil aviation authorities and industry to collaborate to advance standard approaches to achieve the highest level of aviation safety.

Specifically for emerging eVTOL concepts, we expect that many early eVTOL will be certified and able to operate in the system without significant need for new regulations - with pilots, operating within the existing airspace structure and rules, and utilizing existing aviation infrastructure. As operations scale and rely more heavily on automation, new regulations will be needed to support the additional complexity of operations - relying more heavily on digital communications than voice communication to provide positive control.

Validating that these aircraft can operate safely and reliably within the existing airspace system (including infrastructure) is essential to realizing the market potential and gaining community acceptance. To that end, central governments play a key role in standing up testing and demonstration programs to facilitate adoption of drones and eVTOLs. These programs will provide valuable resources to industry for the testing of vehicles, battery technology, and airspace integration approaches, understanding and validating infrastructure requirements, and measuring noise and other community impacts. Results from these public-private partnership activities will inform standards development by the International Civil Aviation Organization (ICAO), civil aviation authorities like the Australian Civil Aviation Safety Authority (CASA), as well as regional safety oversight organizations.

In the U.S., Uber is engaged in collaborative research and development activities with NASA and FAA to help inform eVTOL battery standards, infrastructure standards, noise metrics and analysis techniques, and airspace integration approaches. We welcome similar collaboration in Australia to define the appropriate policy frameworks to support technology development and community adoption.

Flexible regulatory approaches to enable innovation and realize the benefits

To support continued innovation, we advocate for government-industry collaboration that will support aircraft OEMs with vehicle testing, and will encourage development of risk-based pathways for aircraft and operator certification that consider the unique characteristics of drone and eVTOL aircraft and operations.

As presented in the paper and documented in several recent studies including a 2018 market study by NASA (see https://www.nasa.gov/aam-studies-reports/), there are a wide range of use cases for drones and eVTOL aircraft. Given the low risk tolerance associated with aviation, the market potential may be slow to materialize without collaborative approaches to inform policy and regulatory pathways to enable technology adoption. Australia's leadership in creating a pathway for commercial drone delivery

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operations has informed regulatory approaches in the United States and other countries. We welcome similar leadership in creating a pathway for UAM.

Community acceptance

Community acceptance will ultimately drive policy and the pace of adoption of these new aviation technologies. Approaches to integration that respect and engage community stakeholders early will facilitate community acceptance and adoption. Operational safety rules, similar to what FAA has termed "community-based rules", combined with low-noise and low-emissions aircraft designs that minimize negative externalities will facilitate community acceptance and adoption.

Safety

Safety is always at the forefront of new aviation technology acceptance. As industry and governments seek to expand the adoption of new technologies in populated communities with operations over people, demonstrating the safety of the technology will be critical to scaling and achieving the broader societal benefits.

Noise

As noted in the proposed approach to noise, in the long run, a centralized, national policy framework approach to noise management and analysis techniques may be desirable to ensure operations are implemented in a manner consistent with acceptable threshold standards. Despite the overall commitment to low noise across the drone and UAM industry, noise will continue to factor into community acceptance, so defining appropriate approaches to measure and analyze aircraft noise will be critical, especially if noise limits are to be defined for a given landing site or aerodrome.

The policy framework approach defined in the paper is rooted in an understanding of the importance of empowering local communities to establish acceptable baseline noise levels while at the same time supporting consistent approaches to measuring and analyzing noise across the country. Consideration of a national approach that does not artificially constrain the potential market for drone and future eVTOL operations or competition yet balances community concerns about noise impacts will facilitate innovation and community acceptance. The outlined approach demonstrates the Australian governments thoughtful recognition of this fine balance, and the perspective that a national approach to noise policy for these evolving technologies should be iterative further highlights the challenge of reconciling the benefits of these emerging aircraft operations against community noise concerns.

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As described in the noise policy section of the paper, the ability to manage the aircraft noise environment in real-time may be feasible in the UTM environment, however this approach raises a number of concerns. We urge additional consideration of the feasibility and tradeoffs of dynamically routing aircraft to achieve acceptable noise impact levels on the ground, particularly given the range of factors that contribute to the overall community noise environment. Collaboration with FAA, NASA, EASA and ICAO (Committee on Aviation Environmental Protection, Noise Working Group) is recommended to share approaches being explored.

Infrastructure

We concur with the high-level approach to infrastructure planning and encourage early engagement with industry to understand the unique infrastructure requirements of operators and specific use cases. Collaborative planning approaches between aviation regulatory experts, city and regional planners, transportation planners, airport planners, building and fire officials, and community stakeholders will be essential. Supporting regional level planning for infrastructure will ensure a systematic approach and include key community nodes and traditional surface transportation hubs in a holistic multi-modal planning process.

Careful consideration of how existing aerodrome and heliport design standards can be adapted for eVTOL operations is needed. Supplemental standards may be required to address charging, energy storage systems, battery cooling, fire suppression and emergency operations. ICAO [Annex 14, Aerodromes, Volume II: Heliports] and other heliport design standards should be evaluated in consultation with other governmental and industry stakeholders, including the FAA and EASA, for applicability to eVTOL aircraft.

In addition to the previously discussed noise and community acceptance considerations, airspace protection at and around facilities should be considered to ensure the long-term equitable access to the airspace in and around key nodes, including the planning and zoning for tall structures. Adequate energy grid services will also be required to support a facility's peak electricity demand.

Lastly, integrating new aviation facilities into existing infrastructure requires coordinated planning approaches across local and regional transportation, planning and zoning, land use and environmental planning processes. Collaboration among civil aviation authorities and local authorities to ensure harmonized approaches to eVTOL infrastructure planning will facilitate sound planning approaches that can be adopted globally. Commonwealth and State government support will be essential to cities and regions as they engage with industry and community stakeholders to define policy (including zoning, noise management, environmental and land use compatibility planning approaches) and develop programs to jointly develop prototype infrastructure to support early operations.

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Global harmonization

In the early phases of technology development it is likely that approaches to regulations may vary from country to country. Ultimately, however, it is in the best interest of regulators and industry stakeholders to work towards globally harmonized approaches to regulations.

We welcome further discussion as you advance policy development to support drone and eVTOL operations in Australia. Please contact Mitch Cooper ▮▮▮▮▮▮▮▮▮▮▮▮ f you would like to discuss any of these comments.

Warm regards,

Eric Allison
Head of Elevate