

Comments on “National Aviation Policy Issues Paper on Emerging Aviation Technologies”

Overall, the paper is very comprehensive. Indeed, there is tremendous opportunity in the emerging model of what has been called drones-as-a-service (or drone services, for short), and that there should be appropriate regulatory frameworks as outlined in the paper.

Several issues that perhaps could be further considered:

- *aesthetics*: the impacts of drones on the environment as well as noise have been considered in the paper, but I would like to highlight also the notion of aesthetics; there have been various demonstrations of drone swarms (e.g., Intel) as a light show mainly as once-off events, but light shows aside, more broadly speaking, if drones were to be used, say for deliveries, on a much larger scale, the city skyline could be affected (hence, the aesthetics concern) with drones appearing in mass haphazardly in the sky (even if silent) unless the drones are routed along particular pathways (e.g., “air highways”) for most of their journeys (imagining streams of drones moving orderly through the sky, as part of the city skyline, which can perhaps even contribute to aesthetics positively); a question is how we will allow drones to shape the city skyline if they would be used on a large scale, in the longer term
- *regulatory framework around new infrastructure, ground and in the air*: eVTOL vehicles and drones would require recharging stations, ports (for pick up and drop off) and drone stations (e.g., Amazon has a US patent on delivery-drone stations similar to a large building-sized bee-hive, and a US patent on a flying warehouse like an air-ship); there could be a need for policy/rules regarding where such drone ground stations could be sited and their impact on the locality, as well as a policy on what types of in-air stations should be allowed and where they can be located (though perhaps too futuristic, imagine several large air-ships almost situated permanently over the city of Melbourne!)
- *identification of drones and their purpose/intention of flight from afar via wireless electronic means*: a question is whether such a wireless electronic identification system can and should be developed, and who would be able to interrogate such drones to extract this information, and whether the public should be permitted to extract some of these information if the drones are going over public/private air-spaces
- *drones flying over private property*: will there be mechanisms to buy/rent-out access to low-attitude airspace over private property?
- *drones for actuation*: several key uses of drones/eVTOLs were mentioned including transport and passive forms of surveillance, but another category of application is the use of drones for actuation, with the ability to repair hard-to-reach objects or certain actions (e.g., via a robotic arm) or using drones in construction – to consider more futuristic applications; would there need to be further consideration of this category of drones, e.g. what they are permitted to do?
- *mandating certain safety features on drones*: would there be a need to mandate certain safety features on drones, e.g., akin to parachutes and airbags (analogous to the ANCAP safety rating for road vehicles)? Also, there could be blackbox for drones to record flight events in case of incidents (though how secure they can be is a question) and would companies operating drone services need to keep a record of all flights of their drones which are presumably tracked (for improved traceability, in case of the need for any future investigations)?
- *security of drones and drone protection rules*: will there be a need for certification of drones, not only that they are mechanically “air-worthy” but also that they have basic cyber-security features embedded (or “cyber-worthy” to coin a term)? E.g., their communications encrypted and protected, so that they cannot be easily hacked and hijacked or their communications easily intercepted; also, it is mentioned the use of geo-fencing, which is potentially hackable via GPS spoofing; also, I guess laws/rules for property protection would need to be adapted for drone protection?

Thank you,
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