

4 June 2021

Enabling Drone Integration - Consultation  
Ministry of Transport  
PO Box 3175  
Wellington 6140

Email: [enablingdroneintegration@transport.govt.nz](mailto:enablingdroneintegration@transport.govt.nz)

**Submission on the Ministry of Transport Discussion Document ‘Enabling Drone Integration’**

**(Discussion Document dated 6 April 2021)**

1. Thank you for the opportunity to provide feedback on the Ministry’s Discussion Document ‘Enabling Drone Integration’ dated 6 April 2021 (the ‘Discussion Document’).
2. NZ Airports also appreciates the opportunities that have been provided for early consultation as the drone environment develops, and in particular for NZ Airports representatives to meet on 21 April 2021 to be briefed on the Discussion Document.
3. This submission is from NZ Airports and is made on behalf of the Association’s members<sup>1</sup>. Individual airports may also provide comments, and this submission should be read in conjunction with any separate submissions from airports.
4. NZ Airports has no objection to this submission being made public.
5. NZ Airports will be pleased to provide any further information required in support of this submission. The contact person is:

Kevin Ward  
Chief Executive  
New Zealand Airports Association  
PO Box 11 369  
Wellington 6142

DDI: 04 384 3217  
Mobile: 021 384 524  
Email: [kevin.ward@nzairports.co.nz](mailto:kevin.ward@nzairports.co.nz)

**General**

6. NZ Airports supports the Ministry’s approach in the Discussion Document to use ‘drone’ as a generic term to describe all forms of unmanned aircraft to which CAR Parts 101 or 102 apply for the purposes of this consultation.
7. Airports have a strong interest in the management and regulation of drones, to both embrace the integration of drone technology in the aviation system and to ensure that the transition to

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<sup>1</sup> Ardmore Airport, Auckland International Airport, Chatham Islands Airport, Christchurch International Airport, Dunedin International Airport, Gisborne Airport, Hamilton Airport, Hawke’s Bay Airport, Invercargill Airport, Kapiti Coast Airport, Kaitaia Airport, Kerikeri Airport, Marlborough Airport, Masterton Airport, Matamata Airport, Motueka Airport, Nelson Airport, New Plymouth Airport, Palmerston North Airport, Queenstown Airport, Rangiora Airport, Rotorua Airport, Takaka Airport, Taupo Airport, Tauranga Airport, Timaru Airport, Wanaka Airport, Wanganui Airport, Wellington International Airport, Westport Airport, Whakatane Airport, Whangarei Airport

increased use of drones does not reduce safety or productivity of existing aviation participants, particularly in the vicinity of aerodromes.

8. NZ Airports acknowledges that -
  - 8.1. the introduction of drones into the aviation system is a global issue, and no doubt New Zealand will want to make progress at a measured pace to align internationally as much as possible; and
  - 8.2. the pace of change in technology and the rapidly increasing availability and use of drones presents challenges for safe integration in aviation.

### **Integration of drones into the aviation system**

9. NZ Airports supports the Government's long-term objective of safe integration of drones into New Zealand's civil aviation system and ultimately within the wider transport system.
  - 9.1. NZ Airports continues to support maximising the social and economic benefits from the use of drones while integrating appropriate drones safely with the NZ aviation systems.

NZ Airports supports integration of appropriate drones into the aviation system.

10. The Discussion Document correctly identifies the wide range of drones (scale, operating environment and uses) that are available.
  - 10.1. NZ Airports submits that more should be done to separate drone activities into two separate groups for managing safety risk and potential integration into the aviation system –
    - 10.1.1. Those that fly in airspace that is shared with traditional manned aircraft.
    - 10.1.2. Those that fly outside airspace that is shared with traditional manned aircraft.
  - 10.2. To date the only distinction in drone operations has been those drones subject to CAR Part 101 and those subject to CAR Part 102.
  - 10.3. Part 101 flights are able to operate in airspace that is shared with manned aircraft.
    - 10.3.1. This risk is currently managed by requiring "agreement" with an aerodrome operator if within 4km of an aerodrome or air traffic control approval to access controlled airspace.
    - 10.3.2. There is a large proportion of this group that do not intend, nor require, access to shared manned airspace – this group need to be defined and managed in a separate way. They are not, and need not be, familiar with aviation rules and should have certainty of airspace that can be occupied without being shared with manned aircraft.
    - 10.3.3. To achieve that goal there may be changes required to airspace designation. At present controlled and uncontrolled airspace extend downwards to ground level. Is that appropriate other than within 4km of an aerodrome?

Air space designations need to be reviewed to provide for separation of drones that are not intended to be in the aviation system and integration of those that share airspace with manned aviation.

- 10.3.4. Defining airspace that separates those aircraft and drones that are within the aviation system from those that are not is a key step for integration. As the designated Airspace Authority, the CAA should engage with aviation participants to advance this work. Airports are stakeholders in the aviation system and are keen to be part of that process.
  - 10.3.5. The definition of airspace needs to be easily interpreted by those drone operators that are not in the aviation system. Procedures, resources, and rules are needed to ensure that those drone operations not in the aviation system remain out of the manned airspace, and likewise if a manned aircraft does have reason to fly into airspace that has been defined for non-aviation participants there need to be procedures to manage or mitigate the risks.
- 10.4. CAR Part 102 is used for certification of those that may generally fly in shared manned airspace. Drones that may fly in shared manned airspace may therefore be operating under CAR Part 102 (and those under CAR Part 101 with controlled airspace clearance or agreement of an aerodrome operator) within 4km of an aerodrome.
- 10.4.1. NZ Airports suggests that this arrangement is not sustainable as drone activity increases.
  - 10.4.2. CAR Part 102 certification provides no transparency for other airspace occupiers of the basis upon which flights are being shared in airspace. The certificates for operation are entirely a matter between the certificated operator and CAA.
  - 10.4.3. CAR Part 102 in effect provides for specific operational requirements similar to rule exemptions, and in this respect is unlike (and inconsistent with) most other rules which set out transparent requirements for the certificated operator to comply with as part of an overall aviation system.
  - 10.4.4. Individual CAR Part 102 certifications risk creep in standards, inconsistency between operation conditions, and even potentially conflict in conditions, particularly over time. In the case of drones, individual certification is being used as a substitute to having rules that would otherwise transparently disclose how drones and manned aircraft use shared airspace.
  - 10.4.5. We submit it is poor regulatory practice, and a safety system design flaw, to have a subset of operations in shared airspace operating under authorisations about which other operators are essentially in the dark.
- 10.5. Rules and airspace designations are urgently required to manage drones in airspace shared with manned aircraft.

Reliance on CAR Part 102 to manage the risk of drones in airspace shared with manned aircraft is inappropriate.

- 10.6. NZ Airports has consistently submitted that drones intended to operate in airspace that is shared with manned aircraft should be subject to the same regulatory environment as manned aircraft in relation to –
- 10.6.1. Airworthiness and registration of aircraft on a CAA register.
  - 10.6.2. Qualifications of the pilot in command (defined appropriately for unmanned aircraft).
  - 10.6.3. Compliance with aviation rules.
  - 10.6.4. All aspects of the aviation system as would apply to manned aircraft.

10.6.5. Enforcement and penalties.

- 10.7. Aviation regulation in New Zealand follows a “closed system” or “life cycle” model that has stood the test of time and applies appropriate safety processes to all participants. It incorporates, “entry control”, education, surveillance and monitoring, compliance activities, and “exit control”. This system has been described by the CAA in its Regulatory Operating Model<sup>2</sup>. Extracts from the model, including a diagram of the life cycle of aviation participants, are attached as **Appendix 1** to this submission. This approach supports the division of drone operations and operators into those within the aviation system, and those operating outside it.
- 10.8. Drones not intended to fly in airspace shared with manned aircraft should be managed outside of the aviation system – but with sufficient controls or regulation to ensure operators know where their limits apply to stay out of shared manned aircraft space.
- 10.9. In the absence of a mature aviation system with respect to drones, airports have been participating by entering into agreements with drone operators within 4km of an airport. Ideally there should be no need for such arrangements. Aerodromes do not get involved in approving flight of manned aircraft near the aerodromes, because those operators and equipment are fully inducted into the aviation system. If the rules were clear (as per the principles set out in 10.6 above, and the CAA’s Regulatory Operating Model), drone flights would simply be just another aircraft movement.

Non-aviation system participant drones should be excluded from manned airspace within 4km of an aerodrome. Those drones participating in the aviation system comply with aviation rules and fly in shared manned airspace with the same rules (i.e., not requiring airport agreement unless that applied to all aircraft)

11. Until such time as a rule set and airspace designations integrate drones with manned aircraft, NZ Airports advocates that the current arrangements within 4km of an airport remain subject to the following points being considered -
- 11.1. Aerodrome operators have many experiences with drones operating within 4km of an aerodrome and have concerns for safety based on those experiences.
- 11.1.1. The lack of transparency with CAR Part 102 certification and experiences with drone operators (both Part 101 and 102) being found to be not being fully aware of risks contributes to these concerns.
- Although the majority of drone operators try to do the right thing, most do not have an awareness of airspace issues around aerodromes such as Ardmore and demonstrate poor knowledge of approach paths flown by manned aircraft, especially low level helicopter approach sectors that are not in line with the runway;
- 11.1.2. Confusion with the status of flights logged through Airshare has been a concern when flight is within 4km of an aerodrome.
- 11.1.3. The limited visibility of drone operations that is available to ATC is not available to aerodrome operators where there is no ATC (or outside the hours of ATC).

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<sup>2</sup> See [CAA Regulatory Operating Model - Version 2, 5th February 2014 \(aviation.govt.nz\)](#)

- 11.1.4. We understand that flights logged in Airshare do not involve any active management during their operation and it is often unclear when an operation has been concluded.
- 11.1.5. The ability of drone operators to issue NOTAMS within 4km of aerodromes has arisen as a concern for airport operators.
- 11.2. More attention needs to be given to the risk of un-commanded flight of a drone into manned airspace within 4km of an aerodrome. Unlike aircraft systems, redundancy is not likely to be part of the drone control system for drones operated outside the aviation system. Therefore, the probability of an aircraft versus drone collision near aerodromes would not meet the ICAO 10-7 safety level.
- 11.3. If the 4km requirements were to be refined in any way, they should at least apply to the take-off and approach surfaces and the circuit area of the aerodrome. The aerodrome Obstacle Limitation Surfaces (specifically the approach/take-off fans and visual segments) are where commercial passenger aircraft are low, slow, and not very manoeuvrable.
- 11.4. There are legitimate needs for drones to operate on or in the vicinity of airports. These should be managed and regulated the same as manned aircraft except if operated within a building (such as a hangar). The current requirement for airport agreement (or air traffic control clearance in the case of a controlled airport) for drones operated within the confines of a building at or within 4km of an aerodrome is unnecessary.
- 12. The Discussion Paper, despite the policy intent and the name of the paper (Enabling Drone Integration), does not appear to advance integration, but rather reinforces the adoption of separation with no path evident to integration.
- 13. A key aspect for integration of drones into the aviation system arises from the concept of “see, detect, and avoid” that underpins visual flight rules. As many drones may not be adequately visible to other pilots, integration into the aviation system needs a solution to overcome this safety risk.
  - 13.1. Current progress on introducing ADS-B for aircraft surveillance presents one opportunity to make headway on this issue, but it requires system design effort, and we therefore pose some questions –
    - 13.1.1. The mandatory requirement for ADS-B(out) only applies to controlled airspace. Is this adequate for an integrated drone environment?
    - 13.1.2. Is there sufficient recognition of the value of the role ADS-B(in) could play in overcoming this issue?
    - 13.1.3. Are there drone surveillance technologies that could simply integrate with ADS-B?
    - 13.1.4. Is timing to resolve this of the essence, given the current programme of ADS-B installations?
    - 13.1.5. Appendix 2 of the Consultation Document “Drone projects across government” appears to be the only reference to ADS-B in and out. The NSS programme appears to have anticipated ADS-B potentially having a role in the integration of drones, but it does not appear to have been developed.
    - 13.1.6. Is the supplier of ADS-B surveillance infrastructure (Airways Corporation) adequately structured, mandated or contracted to ensure a holistic approach is taken to surveillance in a drone-integrated aviation environment?

System design is required to overcome the VFR dependence on ‘See, detect and avoid’ in an aviation environment that integrates drones with manned aircraft. ADS-B should be integrated with drones.

- 13.1.7. Should drones operating in shared manned airspace be required to be radio-equipped and operated with appropriate rating? (This may be more onerous than the requirements for piloted aircraft which can operate NORDDO and nil-transponder in Class G airspace, however the drone is not always able to be visually detected in the same way that an aircraft is)

### **Drone aircraft registration**

14. Consistent with the principles set out in 10.6, NZ Airports supports a mandatory requirement for drone aircraft registration.
- 14.1. For drones that are going to share manned airspace, the drone registration system needs to be integrated, or designed to be consistent with, the manned aircraft register. It should be subject to the same rigour, integrity, transparency, and access as occurs with other aircraft.
- 14.2. Aircraft that are not in the aviation system may have a different system to ensure distinction from those that are part of the aviation system. Consideration might be given to free registration to minimise barriers to compliance.

NZ Airports supports regulated registration of all drones that are part of the aviation system (those intended to be flown in shared manned airspace).

### **Drone Pilot qualifications**

15. Consistent with the principles set out in 10.6, NZ Airports supports a mandatory requirement for drone pilot qualification.
- 15.1. If a drone is to be flown in airspace shared with manned aircraft, the pilot needs to have adequate understanding of the rules.
- 15.2. NZ Airports disagrees with drone pilot qualifications (whether or not under CAR Part 102) being outside the aviation system if flight is allowed in airspace shared with manned aircraft. We consider this would be inconsistent with good safety system design and long-standing CAA regulatory models. Existing pilot qualification rules should be relied upon or adapted if specific drone pilot issues are identified.
- 15.3. Note that NZ Airports draws a distinction between drones that are flown in airspace shared with manned aircraft and those outside the aviation system.
- 15.4. To help ensure that drone flights operating outside of the aviation system do actually remain clear of shared manned airspace, a simple qualification could be required (simple multichoice test) similar to what occurs when applying for a motor vehicle learner licence.

NZ Airports supports pilot qualification requirements for the flight of drones in airspace shared with manned aircraft. The qualification must be part of the aviation system.

### **Surveillance of drones**

16. More clarity is required of the party who is responsible for monitoring usage, compliance and enforcement of drone activity that is outside the aviation system for manned aircraft. The

responsibilities around this are currently unclear. Integration of drones in shared manned airspace should be the CAA as the designated Airspace Authority.

17. Airports want to be able to work closely with an authorised agency to quantify the risk and use data to provide targeted education around the larger airports (such as Auckland). Available technology to monitor drone usage is subject to restrictions in the Radiocommunications Act. Established drone surveillance products available to be used elsewhere in the world cannot be used by NZ airports. The policy paper is silent on this, and we believe it is a gap that needs to be considered and included in this scope of work.

Yours sincerely,

A handwritten signature in blue ink, appearing to read 'Kevin Ward', written in a cursive style.

**Kevin Ward**  
**Chief Executive**

NZ Airports  
4 June 2021

## Appendix 1, CAA Regulatory Operating Model (2014), Extracts

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### 5. Overarching Regulatory Principles

- Public interest is paramount.
  - While the CAA works with participants, it represents the public interest in civil aviation safety. It acts independently as a regulator in holding participants to account for their safety performance.
- Participants are responsible for good safety management.
  - A responsible aviation community is the front line of safety assurance. Participants exercising privileges in the civil aviation system are responsible for the safety of their operational activity. The Civil Aviation Act 1990 requires that participants shall carry out their activities safely and in accordance with relevant prescribed safety standards and practices. Where required by Civil Aviation Rules (Rules), participants must establish and follow a management system that will ensure compliance with relevant safety standards. Under this system approach the expectation is that participants:
    - fully understand their safety regulatory responsibilities;
    - are qualified and resourced to fulfil their responsibilities;
    - willingly comply with regulatory requirements;
    - understand and apply documented procedures and approved practices;
    - investigate and rectify safety problems when they occur; and
    - demonstrate a commitment to safe practices within their organisation.
  - Attitudes and behaviour of participants and all persons carrying on activities in the civil aviation system are key to effective safety performance.

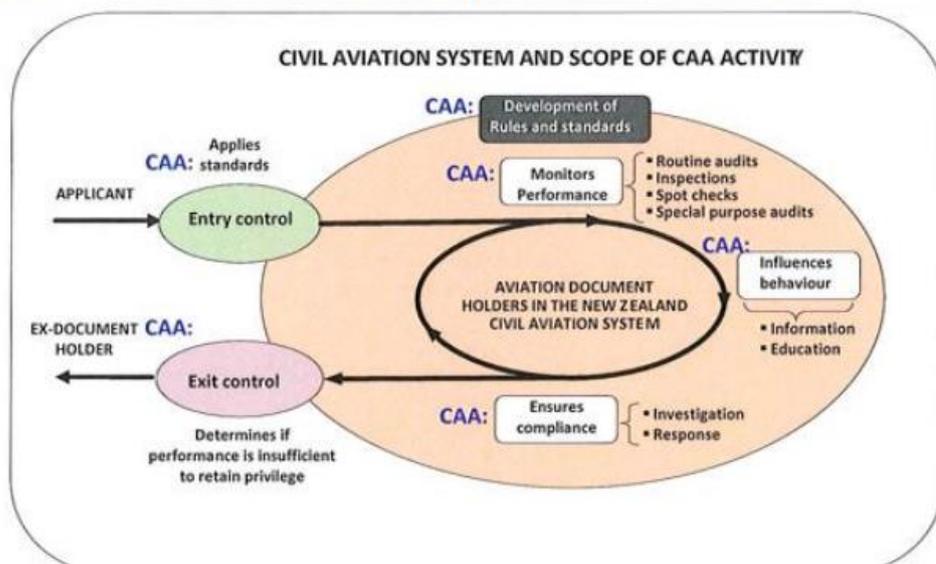
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### 9. 'Life Cycle' Approach to Regulation in the Civil Aviation System

The boundary of the civil aviation system is determined by civil aviation legalisation and Rules. Rules specify the activities for which an aviation document is required and prescribe the requirements for entry and continued operation in the civil aviation system.

The diagram below shows the life cycle of a participant within this system and the regulatory activities and interventions of the CAA at the various stages in the life cycle.

**Figure 2: Scope of CAA Activity within the Life Cycle of Aviation Participants**



Within the system there is various CAA activity at each stage as follows:

- **Entry Certification** – Participants are required to show how they fully comply with the appropriate requirements and have the ability to maintain compliance. The Director's entry certification and licensing function is applied at this point. At this point the regulator acts as the 'gatekeeper' to the aviation system to ensure that all who enter it can operate safely. The onus is on the person or organisation seeking to enter the system to demonstrate that they meet all the requirements and that, in the case of organisations, all necessary management systems that may be required by Rules are in place. The same process is applied to any changes to an operating certificate (certificate amendment). In all cases the organisation's management system becomes the basis for entry into, and subsequent operation within the system.
- **Continued Operation** – Participants must continue to meet requirements while operating in the system (and ideally willingly exceed minimum requirements). In the case of organisations this includes the continued effective operation of their management systems required under Rules. Regulatory activities include appropriate monitoring (surveillance), provision of advice and technical guidance material, safety promotion and other activities to support this outcome. This includes investigation and enforcement action as appropriate. A participant's aviation document may have conditions placed upon it limiting the exercise of privileges under the document if this is considered necessary in the interests of safety.
- **Exit** – A participant may exit the system voluntarily, requesting the suspension or revocation of an aviation document. The Director may suspend or revoke an aviation document where such action is necessary in the interests of safety or for reasons of non-compliance with other regulatory requirements, e.g., payment of fees and charges.