



Aircraft Operations
Aviation Environment Branch
Department of Infrastructure, Transport, Cities and Regional Development
GPO Box 594
CANBERRA ACT 2601
noiseregulation@infrastructure.gov.au

Response to Issues Paper: Review of Air Navigation (Aircraft Noise) Regulations 2018 – Remotely Piloted Aircraft and Urban Air Mobility Aircraft

Thank you for the opportunity to comment on the abovementioned Issues Paper. We note that consideration and policy consultations regarding how to deal with noise emitted from drones and urban air mobility aircraft is in its infancy.

Our comments in relation to the Issues Paper are attached. These comments are mainly of a technical nature and have been prepared by The Department of Environment and Water Regulation (DWER) which is responsible for noise regulation in Western Australia. The comments do not represent a final or agreed Western Australian Government position.

In Western Australia the Department of Transport represents the State on the Commonwealth-State-Territory Drones Working Group and is responsible for co-ordinating advice across the jurisdiction concerning drones.

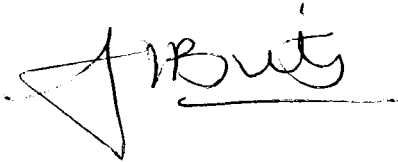
As a general observation, Western Australian Government agencies are supportive of your department's proposal to concentrate Commonwealth noise regulation for drones on their air navigation. There appears to be little interest at State level for transport or planning agencies to manage defined flight corridors. This is seen as the responsibility of the Civil Aviation Safety Authority.

We note that your department proposes to exclude the Commonwealth regulation of drones at their base of operations, thereby allowing State law to apply to noise emitted by drones. Western Australia is not considering developing laws specifically related to drones and noise at present.

Your department's proposal that noise regulations do not apply to certain types of operations, including emergency services, agricultural and other prescribed operations such as lifesaving patrols and essential medical supply is supported.

If you have any queries in regard to the contents of this letter and/or attachments, please do contact the Department of Transport's Bryant Roberts, Director Transport Reform, email [REDACTED]

Yours sincerely

A handwritten signature in black ink, appearing to read 'Brits', with a large, stylized initial 'A' on the left side.

Anne-Marie Brits
A/Executive Director Freight Ports Aviation and Transport Reform

2 December 2019

Comments on the Issues Paper regarding Proposed Noise Regulations for Drones and Urban Mobility Aircraft

Following are comments from the Environmental Noise Branch of the Western Australian Department of Water and Environmental Regulation on the Department of Infrastructure, Transport, Cities and Regional Development *Review of the Air Navigation (Aircraft Noise) Regulations 2018 – Remotely Piloted Aircraft* issues paper (dated September 2019).

The issues paper refers to the operations of:

- Remotely Piloted Aircraft (RPA or drone), being “an aircraft that can be flown by remote control or can fly autonomously through software-controlled flight plans in their computer systems”; and
- Urban Air Mobility (UAM) being “a term used to describe highly automated (including conventionally piloted and remotely piloted) passenger or cargo carrying air transport services in urban areas”.

The types and applications of drones/UAMs in the future is uncertain, with their uses and modes of operation heavily reliant on resolution of safety issues and the emerging directions of market uptake. However, there are three aspects to drone/UAM noise that should be considered in both a technical and jurisdictional sense:

- Noise levels of individual drones/UAM.
- Cumulative noise from flight paths.
- Localised impact near landing sites.

Noise levels of individual drones

The certification or categorisation of drones/UAMs is best done at a Commonwealth level to circumvent interstate issues as a result of the *Mutual Recognition Act 1992*. While reference to international standards (once developed) for individual drone/UAM certification or categorization for noise is preferable, a Commonwealth approach based on a system similar to the Australian Design Rule 83/00 for motor vehicles or a noise labelling and limit scheme for drone/UAM categories similar to that used under European Union Noise Directive 2000/14/EC for portable equipment may be required. These could, for example, be based on L_{Amax} and/or a normalised L_{Aeq} parameters defined by measurement at set distances associated with well-defined fly-over paths, or on Sound Power Levels associated with specified operating modes. A limit scheme will enable categorisation of drones/UAMs in classes that will allow operations that may have different levels of public acceptability.

Testing procedures associated with either of these options, unless defined internationally, also need to be developed. Consideration must be given to unique characteristics of drones/UAMs, such as the tonal aspects of drone/UAM noise. Once the noise output of categories of drones are known approaches to managing noise related with flight paths and landing zones, as associated with the drone/UAM categories, can be developed.

Compliance with drone/UAMs noise limitations set via certification or categorisation is best dealt with at a Commonwealth level, although testing to Commonwealth compliance levels may potentially be done at a state level.

Cumulative noise from flight paths.

The definition of drone flight paths is heavily linked to safety as the options range from the unpredictable, possibly flying from undefined point to undefined point (“as the crow flies”), to a restriction of operations to well-defined flight corridors. Collision detection and avoidance systems would be paramount and given a significant increase in drone numbers restrictions to well-defined flight paths may be a consequence.

The control of noise from unpredictable flight paths would be problematic as the use of predictive algorithms for noise impact such as the ANEF index system only has value for landing/take off sites with high traffic and well-defined flight paths such as major airports. Management of this type of flight path is likely to remain a Commonwealth management issue.

Flights restricted to well-defined flight corridors have a potential to be managed by state transport or planning bodies in a similar manner to the management of road and rail traffic noise. Flight paths can potentially be defined above existing road and rail corridors. Western Australia’s *State Planning Policy 5.4 - Road and Rail Noise* is an example of a planning approach to transport noise. Commonwealth guidance on acceptability criteria however may be relevant.

Given that electronic registration and tracking is likely to be employed for each individual drone/UAM under an all-encompassing traffic management system for safety purposes, compliance with deviations from defined flight corridors are best dealt with at a Commonwealth level as the resultant issue would be a safety as well as noise issue and would be visible via the all-encompassing traffic management system.

Localised impact near landing sites.

While the commercially viable options for drone/UAM operation as yet is unknown, the possibility regarding end of flight destinations or landing sites are numerous. However, similar to flight paths, there are two major categories: the unpredictable - resulting from flying from undefined point to undefined point; and the well-defined – where a set location for drone/UAM landings is established (a “vertiport”).

Management of drones landing (or possibly only hovering) at a random destination may be difficult, however the suitability of fixed landing sites may be assessed with criteria similar to that used for helipads. It is quite possible, dependent on uptake, that the use of vertiports will far outstrip the use of heliports. Given known noise levels of individual drones/UAMs, the criteria for assessment of the suitable location of vertiports may potentially be left to state transport or planning bodies, however once again Commonwealth criteria and guidance may be relevant. Criteria for helipads is variable across the States and Western Australia does not have legislated criteria for the assessment of helipads.

Proposals in the Issues Paper

The issues paper separates the regulation of drones and UAMs, however from a noise perspective the three aspects described above are relevant to both, albeit to different extents depending on their modes of operation. The following comments on the proposals are to be read in concert with the comments above.

Section 2.7: Proposed noise regulation of drones

a. Concentrating Commonwealth noise regulations for drones on their air navigation (not their base of operations) based on:

- *drone size, weight, and design;*
- *tested noise levels e.g. effective perceived noise in decibels, sound exposure level, LAMax (the maximum noise level reached) or weighted noise levels which are used for traditional aircraft;*
- *operational height and location e.g. commercial/industrial/residential/rural/remote areas; and*
- *particularly in built-up and residential areas, the use of restrictions based on total number of flights per day, the duration of flight, how many flights per hour and time of flights (day/night).*

This proposal excludes the Commonwealth regulation of drones at their “base of operations”. The opportunity should be taken to develop suitable criteria for vertiports relating to drones. Note also that noise exemption approvals under the *Air Navigation (Aircraft Noise) Regulations 2018* does not seem efficient for craft that are (at least initially) likely to be highly variable in style and ubiquitous.

b. Regulations not applying to recreational drones, all drones below 250 grams and drones operating under standard operating conditions.

c. Regulations not applying to particular types of operations including emergency services, agricultural and other prescribed service operations (e.g. lifesaving patrols, essential medical supply delivery).

Referring to points b. and c., the Western Australian *Environmental Protection (Noise) Regulations 1997* (noise regulations) does not cover noise from transport sources, however they do cover “model aircraft”. While “model aircraft” are not defined in the noise regulations or the Western Australian *Environmental Protection Act 1986*, the *Civil Aviation Safety Regulations 1998* define “model aircraft” as “an aircraft that is used for sport or recreation, and cannot carry a person”. This is a wide definition and encompass operations that may not suitable to be regulated under the noise regulations. The bulk of the issues dealt with under the noise regulations are dealt with by local government who are not sufficiently placed or resourced to deal with noise issues that are based on moving noise sources not on a premises.

Amendments would be required to reduce the span of the noise regulations regarding model aircraft, similarly definitions, depending on future amendments to other legislation, may be needed to redefine noise from emergency vehicles such as ambulances, which are currently exempt under the noise regulations, particularly in relation to UAMs. While the noise regulations apply to terrestrial-based motor sports occurring on premises, consideration will have to be given to the extension to the management (possibly via approval) of drone-based sporting events (with or without a person in the aircraft).

d. Drones that meet recognised international aircraft noise certification standards not requiring approval under the Regulations (as is the case now with other aircraft types).

Refer to comments in text above.

e. Benchmarking acceptable noise levels for overflying different land use areas (including residential areas) having regard to acceptable noise levels permitted from other similar noise generating equipment under State/Territory legislation

Leaving aside the health impacts of noise, there is no indication that noise from drones have a similar level of public acceptability to any other noise sources. A considerable amount of research is still required, additionally, as drone sources become more ubiquitous, the level of acceptability is likely to change over time.

f. Allowing noise regulation of drones by State/Territory Governments where this is consistent with the application of their regulations to other types of noise disturbance from operating equipment and not inconsistent with Commonwealth legislation.

Refer to comments in text above.

Section 3.7: Proposed noise regulation of UAM aircraft

a. National noise regulation for UAM aircraft using noise levels based on aircraft with similar propulsion, i.e. helicopter, propeller-driven aircraft or tilt-rotor.

It is not yet known how well UAM noise sources relate to helicopter-type noise sources. The tonal content of smaller multi-rotor aircraft is likely to have a considerably different spectral profile. More research is required into noise emissions and public acceptability of UAMs.

b. Concentrating Commonwealth noise regulation of UAM's on their air navigation (not their base of operations) allowing for:

- operational height and location e.g. commercial/industrial/residential/rural/remote areas; and*
- in built-up and residential areas, the use of restrictions based on total number of flights per day, the duration of flight, how many flights per hour and time of flights (day/night).*

Similar to the comments provided for drones, this proposal excludes the Commonwealth regulation of UAMs at their "base of operations". While the location of vertiports may be a state or local government issue, the opportunity should be taken to develop suitable criteria for vertiports at a Commonwealth level.

c. UAM aircraft that meet recognised international aircraft noise certification standards not requiring approval under the Regulations (as is the case now for other aircraft types).

If international aircraft noise certification does not provide enough information to enable flight path or vertiport site assessment Commonwealth certification or classification will be required.

d. Allowing noise regulation of UAM aircraft by State/Territory Governments using their environmental protection regulations where this would be consistent with the

application of these regulations to other types of aircraft such as at landing sites and not inconsistent with Commonwealth legislation.

See previous comments in text above. Legislation under state planning or transport portfolios may only be applicable to the management of UAMs following well-defined flight paths or existing transport routes.

e. Requiring Australian Noise Exposure Forecasts to be produced by the aircraft operator around landing and take-off sites to identify and manage potential noise impacts.

The application of Australian Noise Exposure Forecasts (ANEFs) may not be appropriate for UAMs. As noted in the previous comments above, ANEFs are relevant to aircraft operating from their “base of operations” and suitable to airports with large numbers of aircraft on fixed flight paths. The use of ANEF indexes (or the like) while they may be relevant to high density and fixed flight path vertiports, is unlikely to be appropriate for unpredictable flight paths. The concept will also have limited planning application if the UAMs generally have a vertical take-off and landing pattern.

