Australian Government

Department of Infrastructure, Transport, Cities and Regional Development

Review of the Air Navigation (Aircraft Noise) Regulations 2018 – Remotely Piloted Aircraft

Issues Paper

September 2019

Summary

Purpose

The purpose of this paper is to seek comments through consultation on a review of the Air Navigation (Aircraft Noise) Regulations 2018 (the Regulations).

The purpose of the review is to help determine the appropriate scope and breadth of future noise regulation primarily for remotely piloted aircraft (RPA or drones) and urban air mobility (UAM) aircraft. A separate issues paper on specialised aircraft will look at noise regulatory issues related to future supersonic aircraft types and current aircraft types such as historic aircraft operations.

Terms of reference for the review are at **Attachment A**.

The Regulations are made under the *Air Navigation Act 1920*. Approvals under section 17 of the Regulations have been granted to a drone delivery service in Canberra and Logan City, Queensland for aircraft operations to which noise standards in the Regulations do not apply.

Drones and UAM are emerging and innovative technology being used or planned for use around the world. Drones in particular have a diversity of applications including in the agricultural sector, emergency services, infrastructure inspections and surveys, surf lifesaving, delivery of medical supplies, aerial photography and commercial and residential product delivery.

UAM aircraft are on-demand and automated passenger and cargo air transportation services, with or without a pilot, operating within an urban area. Aircraft of this type are expected to be generally vertical take-off and landing (VTOL) aircraft. For UAM aircraft the propulsion for these aircraft (electric or hybrid-electric) will be similar to existing aircraft types, however, the airframe design, noise output and frequency may be different to traditional aircraft.

Noise regulation for conventional aircraft, is largely established through International Civil Aviation Organization (ICAO) standards and was the basis for the current Australian regulatory approach. However there are currently no ICAO aviation standards for drones and UAM.

Countries across the world are considering what regulations and standards would be appropriate in the future given the rapidly evolving technological development associated with these types of emerging and innovative technological aircraft.

Given the current and anticipated future use of drones and UAM within Australian airspace, it is therefore appropriate that the Department review the Regulations and examine how to effectively minimise noise impacts on the community from the use of these aircraft now and into the future.

The review will look at relevant Commonwealth legislation and regulations covering these different aircraft operations and state, territory and local government regulations that potentially can be applied to some of these types of noise impact, as well as international developments in aircraft noise regulation.

The review will not consider safety, privacy issues (e.g. use of cameras), military drones, security considerations or environmental effects on flora and fauna in relation to aircraft operations which are addressed through other legislative and regulatory regimes.

1. Regulatory Environment

1.1 Aircraft Noise Regulations

The *Air Navigation Act 1920* (the Act) gives effect to some parts of the International Convention on Civil Aviation (the Chicago Convention), which regulates all aspects of international air transport.

Annex 16 of the Chicago Conventions sets out noise standards that apply to various types of aircraft. Under the Air Navigation (Aircraft Noise) Regulations 2018 (the Regulations), aircraft to which such noise standards apply are generally required to have a noise certificate, which can be issued where the relevant international standards set out in the Regulations are complied with. However, the Regulations also set out a procedure in section 17 under which aircraft to which no standards apply can obtain approval to operate despite not having (and not being able to obtain) a noise certificate.

Approvals under section 17 of the Regulations have been granted for some time to vintage, adventure, ex- military and other historical aircraft operations for which noise standards do not apply and more recently to a drone delivery service in residential areas in Canberra and Logan City, Queensland.

Pending completion of this review of the Regulations, in relation to drone operations the Department will focus its regulatory resources on those commercial operators that propose to operate in residential areas and that have exemptions from CASA under Subpart 11.F of the Civil Aviation Safety Regulations 1998 (CASR) from any of the requirements in Subparts 101.C and 101.F or an approval under Part 101 of those Regulations (see Section 1.2 below).

The Regulations were not developed to manage drones as a new and emerging technology particularly in the absence of any ICAO standard on noise for drones.

As well as drones, there are also issues related to the future application of the Regulations in relation to other emerging aircraft types including UAM.

1.2 Civil Aviation Act and Civil Aviation Safety Regulations

The *Civil Aviation Act 1988* (the CA Act) establishes a regulatory framework for maintaining, enhancing and promoting the safety of civil aviation in Australia, with particular emphasis on preventing aviation accidents and incidents.

The CA Act establishes CASA as Australia's aviation safety regulator and provides for the making of CASR.

CASR Part 101 consolidates the rules governing all unmanned aircraft activities into one regulation and prescribes the rules for the use of a number of unmanned aircraft types, including remotely piloted aircraft (RPA) and model aircraft commonly referred to as drones.

CASR Subpart 101.F specifically covers RPA operations including aviation safety requirements related to RPA operations, pilot licences, and certification. CASA was one of the first regulators in the world to regulate these types of aircraft.

Although CASA does not have specifically noise-related functions, subsection 9A(2) of the CA Act generally requires CASA to exercise its powers and perform it functions in a manner that ensures that, as far as practicable, the environment is protected from the effects of, and associated with, the operation and use of aircraft.

Further details on the operation of CASR Subpart 101.F can be found on CASA's website at www.casa.gov.au.

1.3 Aircraft noise – what is it and how is it measured?

A moving aircraft causes air around it to be compressed, causing noise waves. Aircraft noise increases when the landing gear and flaps have been deployed, making the aircraft less aerodynamic. The large fans at the front of an engine and from the jet exhaust, as well as propellers, also cause noise waves. As air gets compressed, it reverberates against the aircraft's surfaces and makes noise. This noise can be loudest when the aircraft is taking-off as most aircraft noise is generated by the large fans at the front of each engine and the jet exhaust.

The further away an aircraft is from the ground, the quieter it will be. Aircraft noise may become more noticeable as aircraft change engine thrust, similar to a motor vehicle accelerating, and when the flaps and landing gear are used.

Aircraft noise is also affected by humidity, air density and cloud cover. As noise waves travel, they lose energy and the higher frequency noise is absorbed by the atmosphere.

This is why a more distant aircraft is often heard as a low frequency rumble, and as it approaches the pitch becomes higher.

To comprehensively assess and measure the potential of aircraft noise several measures are used. Each of these are described below.

The Australian Noise Exposure Forecast (ANEF) system is the primary measure of aircraft noise exposure used around the vicinity of airports. It is based on average daily sound pressure levels, which are measured in decibels. Noise exposure levels consider aircraft take offs, approaches to landings and reverse thrust after landing; aircraft frequency and movements on flight paths; and average daily distribution of aircraft arrivals and departures.

Australian Standard AS 2021-2015 Acoustics – Aircraft noise intrusion – Building siting and construction (AS 2021) sets out guidance on siting and construction of new buildings against aircraft noise intrusion and the acoustical adequacy of existing buildings in areas near aerodromes. ANEF and AS 2021 are useful tools for land use planners.

Location of flights paths provides important information to members of the public around location of their house to the location of the flight paths.

Frequency based measures of aircraft noise, otherwise known as N60 (60 decibel), N 65 (65 decibel) or N70 (70 decibel), combines a series of single event noise contours (noise levels of individual flight movements), into high noise zones.

N60 represents a 60 decibel outside noise as a 50 decibel event (the sound level considered intrusive when defining building insulation requirements under AS 2021) inside intrusion. It also captures the high frequency of overflights around training airports and represents a disturbance of noise levels during night time hours.

N65 represents a more comprehensive picture of likely aircraft noise impacts in between the N60 measure (high frequency of less noisy events) and N70 measure (moderate frequency of relatively loud events).

N70 represents a 70 decibel outside noise as a 60 decibel event (the sound level that will disturb a normal conversation or activity) inside a residence with the windows open.

Further information on aircraft noise can be found at www.aircraftnoise.com.au.

2. Remotely Piloted Aircraft (RPA) – commonly known as drones

2.1 What is an RPA or drone?

An RPA or drone, is an aircraft that can be flown by remote control or can fly autonomously through software controlled flight plans in their computer systems.

There are various types of drones including those that operate like multi-rotor helicopters, single-rotor helicopters, aeroplanes, powered lift aircraft and airships.

2.2 Safety Rules for Operating RPA

The majority of small commercially operated drones operating in Australia are required to adhere to what are known as standard operating conditions (SOC) established by CASA. These conditions are relevant for the Department in terms of their potential mitigating effect on noise impacts.

The SOC specify the following requirements, a person:

- May fly only one drone at a time
- Must not fly your drone(s) higher than 120 metres (400 feet) above ground level
- Must not fly your drone(s) over or near an area affecting public safety or where emergency operations are underway, without prior approval)
- Must not fly a drone within 30 metres (laterally and vertically) of people, unless the other person is directly involved in controlling or navigating the drone
- Must not fly over or above people or populous areas
- Must not fly a drone within 5.5km of a controlled aerodrome
    - If flying your drone near a helicopter landing site or smaller aerodrome without a control tower, only if manned aircraft are not operating to or from the aerodrome. If you become aware of manned aircraft operating to or from the aerodrome/ HLS, you must manoeuvre away from the aircraft and land as soon as safely possible
- Must only fly during the day and at no time through cloud or fog
- May only fly a drone within visual line-of sight
- Must not operate a drone in a way that creates a hazard to another aircraft, person, or property
- Must not fly a drone for money or reward unless they have a remote pilot licence, or you are flying an excluded category drone in specified circumstances

2.3 Size and Weight

Drones can range in size from micro to large drones which are similar to conventionally piloted aircraft. The weight of a drone is used to distinguish from a regulatory standpoint different thresholds in terms of requirements under CASR Part 101.

In Australia, the current breakdown of drones by weight is:

- Micro – gross weight of 250 grams or less
- Very small – gross weight of more than 250g and less than 2kg
- Small – gross weight of at least 2kg and less than 25 kg
- Medium – gross weight of at least 25 kg and less than or equal to 150kg

- Large – gross weight greater than 150 kg (requires certification under CASR 21.H pursuant to CASR 101.255.

In Australia and overseas, weight is used by safety regulators to delineate between drones of 250 grams or more. Drones over this size are subject to regulation while drones under this weight threshold are generally exempt. Drones over 150kg are required to have a certificate of airworthiness and their noise impact would be assessed against the relevant noise standard based on the type of propulsion, i.e. those operating as propeller driven aircraft would be considered against the relevant international noise standard.

The existing weight thresholds used for safety regulation would provide a source of regulatory alignment in noise regulation i.e. any drone less than 250 grams being excluded from the noise regime, with the focus of noise regulation being on larger drones regulated in a similar manner to traditional aircraft types.

Other determinants of an RPA's noise level and community impact will reflect a number of factors including the propulsion system, how closely the RPA is being used to people, whether the drone is carrying a payload and the maximum speed of the drone type.

Generally drones that carry payload, are operated closer to people and have higher maximum speeds and will produce higher noise levels than recreational users flying small drones consistent with the SOC i.e. not within 30 metres of a person and not in a populated/populous area.

2.4 Noise

Drones have a diversity of current and future applications including in the agricultural sector, emergency services, infrastructure inspections and surveys, surf lifesaving, delivery of medical supplies, aerial photography and commercial delivery just to name a few.

Where drone operations are outside of residential areas (e.g. agriculture and remote infrastructure inspection) and/or are involved in delivering societal benefits (e.g. surf lifesaving and delivery of medical supplies) they are less likely to raise noise concerns.

The use of drones for residential deliveries, real estate photography or other aerial photography within residential areas, however has the potential for higher noise impacts through concentration of drones into and above built up and residential areas.

These uses and locations raise issues about how noise management for drone operations should be undertaken and by whom. As drones currently meet the definition of an aircraft in the Regulations, they apply to drones in the same way as to other aircraft types including those without international noise standards.

However existing regulations were designed for traditional aircraft types (e.g. helicopters, propeller-driven aircraft and jets) which members of the community are regularly exposed to living in urban area, albeit generally at higher altitudes. Drones by contrast have a unique pitch and are operating at significantly lower altitudes in the case of delivery drones than traditional aircraft types.

There is some noise buffer offered from drone operations to people on the ground where they operate under the SOC i.e. at least 30 metres from people and this may provide a further basis for not requiring noise regulation of these types of operations. However the use of drones with exemptions from the SOC, such as for residential deliveries, has highlighted the need to assess what measures are appropriate to minimise the noise impact of these operations on the community while recognising their potential societal and economic benefits.

Noise in all forms is highly subjective, the reactions of individuals to sound in any given scenario vary and are very difficult to predict.

Determining the noise impact of a drone needs to account for variations in height, nature of operation and distance from the observer.

There are different forms of sound measurement that can be used in analysis of aviation noise, ranging from weighted sound pressures to effective perceived noise levels through to the Sound Exposure Level. Number of movements, duration and time of flights are also factors to consider.

The noise impact of the drone will also be influenced by the ambient background noise present, drones operating in rural and semi-rural settings are likely to be more noticeable than a drone operating in a residential suburb near busy intersections or motorways.

The study of noise produced by drones continues to evolve. Drone manufacturers will continue to engineer drones to reduce the noise impact as the physics and dynamics of drones are largely still in their infancy and updated designs may allow drone manufacturers and/or operators to reduce drone noise levels.

There are no ICAO standards for noise from drones. However, experience in Australia and overseas indicates the highest noise impact is likely to be where commercial operators have sought permission to operate outside of SOC (closer to people) and in particular over or within residential areas. Recreational operations also have a smaller and less continuous noise impact if being used just on an occasional basis.

Commercial operators, chiefly those operating with payloads which do not involve landing of the aircraft but sustained hover will generate higher levels of noise exposure to deliver packages. Other operations are likely to have more transient noise which is shorter in duration if the noise source is only overflight.

The willingness of the public to accept drone operations is also likely to be affected by the societal benefit of the operation. A number of studies have highlighted that public acceptance is higher if the drone is being used for a public purpose, e.g. firefighting, police operations, medical emergencies, blood supplies, versus those with limited perceived societal benefit such as for real estate, commercial product delivery and commercial surveying. There are some members of the community who could perceive higher societal benefits from drone delivery including those with low mobility or limited access to transport.

These perceptions are similar to those for traditional aircraft where a helicopter used for medical emergencies, police operations or search and rescue will be perceived to have a greater benefit than traffic reporting, television coverage of sporting events or sightseeing.

Where noise regulation of drone operations is considered necessary, it will need to consider total number of movements per day, the duration, number per hour and time of flights (day/night). These are relevant considerations when current environmental assessments are undertaken in relation to conventional aircraft operations over communities living near airports or under flight paths.

2.5 Commonwealth environmental legislation

In addition to aviation specific legislation, environmental legislation is also concerned with noise impacts. The Australian Government administers the *Environmental Protection and Biodiversity Conservation Act 1999* (EPBC Act) while each state and territory administers their own environmental legislation.

There are various circumstances in which the EPBC Act may apply to noise emitted by drones, for example where such noise would impact on an endangered species. Another example includes conventionally piloted aircraft where environmental assessment processes that are in place under the EPBC Act are triggered when Airservices Australia (Airservices) examines flight path design

changes which are likely to have a significant impact on the environment. This includes consideration of community noise and aircraft emissions.

2.6 State/Territory/Local government legislation and regulations

Aviation has traditionally been seen as primarily an area of Commonwealth regulation. The Commonwealth has legislated with respect to aviation noise in the Regulations, which currently prevents State/Territory laws regarding noise from operating with respect to noise generated by aircraft.

State/Territory environmental protection legislation already regulates for noise intrusion into commercial, group centres (major shopping districts) and residential suburbs. While these regulations are not uniform across jurisdictions, the majority of regulations for noise cover similar noise intrusions within an urban environment including from motor vehicles, gardening equipment, construction tools, domestic animals, urban social gatherings and municipal services.

Some jurisdictions exclude the regulation of aircraft and leave this for the Australian Government to regulate at the national level. This distinction reflected traditional aircraft operations operating at altitudes, considerable distances and on interstate/international journeys.

However, in the case of noise generated by drones, there are good arguments for the Regulations to be amended to allow such noise to be regulated by State/Territory noise laws. Many drones are not like other aircraft with the ability for drones to operate far closer to people on the ground and operating shorter distances than other aircraft. The proximity of drone operations to the community in built up and residential areas raises the question of whether states/territories or local government are better placed than the Commonwealth government to regulate drones in terms of their suburban noise intrusion, which could be achieved by amending the Regulations to permit the application of State/Territory laws to noise emitted by all/some drones.

Another argument would arise from consideration of how drones are treated compared with other noise making equipment or activities operating in different planning zone areas including noise duration. For example in some jurisdictions currently an offence may be committed if the noise disturbance is for more than five minutes in duration above permitted noise levels. In comparison, drone operations are more transient in nature (e.g. drone deliveries of under a minute) and have a less intrusive impact. States/Territories may be best placed to address such inconsistencies in treatment of noise-producing objects under State/Territory noise laws.

States/Territories are arguably better placed take compliance and enforcement action against people generating an unacceptable noise impact using established regimes not available to the Australian Government. However a challenge with drones is that the person responsible for the immediate noise, i.e. the drone operator, is not always easily identified and the offending drone may quickly depart before apprehension by compliance officers. The CASA drone registration scheme may, once in place, assist in identifying individuals or businesses operating drones.

Drone regulation by States and Territories might be more suited to certain aspects of drone delivery operations e.g. noise around the sites where delivery products (e.g. food) are being prepared and where the products are actually delivered. It will be important to ensure clarity in regulatory responsibilities, where different jurisdictions are involved (as with safety and noise regulation), and to encourage nationally consistent approaches. Care would need to be taken to ensure that any proposed amendments to State/Territory legislation or Commonwealth legislation do not result in unintended inconsistency between State/Territory legislation and Commonwealth legislation that would prevent the operation of the State/Territory legislation.

Some examples of the legislation regulating noise in each State and Territory are listed below:

- Environment Protection (Residential Noise) Regulations 2018 – EPA Victoria https://www.epa.vic.gov.au/about-us/legislation/noise-legislation#noiseregs
- Environmental Protection (Noise) Regulations 1997 – WA Department of Water and Environmental Regulation https://www.der.wa.gov.au/your-environment/noise
- Protection of the Environment Operations (Noise Control) Regulation 2017 – NSW EPA https://www.epa.nsw.gov.au/licensing-and-regulation/legislation-and-compliance/acts-administered-by-the-epa/regulation-summaries#poeonc
- Environmental Protection (Noise) Policy 2008 - EPA Queensland https://www.legislation.qld.gov.au/view/pdf/inforce/current/sl-2008-0442
- Environmental Management and Pollution Control (Noise) Regulations 2016 – EPA Tasmania https://epa.tas.gov.au/policy/acts-regulations/empca/noise-regulations
- Environment Protection Regulation 2005 – Access Canberra https://www.legislation.act.gov.au/sl/2005-38/
- Environment Protection (Noise) Policy 2007 – EPA SA http://www.epa.sa.gov.au/community/noise
- Waste Management and Pollution Control Act 1998 - NTEPA https://ntepa.nt.gov.au/about-ntepa/legislation

An inquiry by the Australian Capital Territory (ACT) Standing Committee on Economic Development and Tourism, which examined drone delivery systems in the ACT, has reported its conclusions and recommendations to the ACT Government on 1 August 2019.

2.7 Proposed noise regulation of drones

Having regard to future development of drone operations in Australia the department is proposing:

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).***

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).

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).

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.

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.

3 Urban Air Mobility (UAM) Aircraft

3.1 What is a UAM aircraft?

UAM is essentially a term used to describe highly automated (including conventionally piloted and remotely piloted) passenger or cargo carrying air transport services in urban areas.

It is anticipated that for UAM aircraft the propulsion for these aircraft will be similar to existing aircraft types, however, the airframe design, noise output, power source and number of movements may be different to traditional aircraft.

In essence what is currently planned for UAM aircraft operations:

- relies on a network of electric multi rotor helicopter or powered-lift aircraft which provide and enable rapid and reliable urban transportation for passengers and baggage/cargo;
- utilises physical infrastructure which can be tops of existing buildings in particular parking garages, existing aerodromes and heliports and unused land surrounding highway interchanges to form the basis of a distributed network of dedicated operating sites; and
- vertical take-off and landing (VTOL) aircraft, propeller-driven aircraft, helicopters and tilt-rotor aircraft would generally fall within this definition, however it is more likely that future aircraft will be electric powered-lift VTOL aircraft, either conventionally piloted or remotely piloted.

3.2 Development of UAM Operations

One of the current major firms that has announced proposed future UAM operations is Uber which is developing shared air transportation—planned for 2023—between suburbs and cities, and ultimately within cities.

Uber Elevate are working with their network partners to launch fleets of small, electric VTOL aircraft in the United States (Los Angeles and Dallas) and to international markets, with Melbourne, announced as the third city. Uber Elevate has announced demonstration flights will commence in 2020 and commercial operations in 2023. There are a number of other UAM projects currently in development.

UAM operations could have significant cost advantages over traditional ground and air transportation, which require heavy infrastructure such as roads, rail, bridges, tunnels or airports.

3.3 Aircraft Development

There has been numerous developments in recent years by companies such as Uber Elevate, AeroMobil, Airbus Vahana, Kitty Hawk, Volocopter, SureFly, Opener, Terrafugia, Ehang, Joby Aviation aimed at progressing aerial ridesharing at scale by developing UAM aircraft and systems.

These include developments in small VTOL aircraft, propeller-driven aircraft, helicopters and tilt-rotor aircraft. Some examples of VTOL designs include multirotor aircraft types such as the Volocopter 2X and the Airbus CityAirbus; and lift and cruise powered-lift aircraft types such as the Kitty Hawk Cora and the Uber eCRM-003.

Changes to electric VTOL designs such as through wing tip design, blade design, the number of blades, and removal of tail rotors have assisted in reducing noise. As designs are matured it is envisaged noise outputs are likely to decrease.

All these UAM aircraft would fall within the current Regulations. As new and emerging technology evolves, including the development of electric aircraft, internationally mandated noise standards for these types of aircraft will be expected to be developed through ICAO but this will take time.

3.4 Noise

For UAM networks to thrive, the UAM aircraft must be acceptable to communities and managing aircraft noise plays a significant role in this acceptance. The manufacturers have stated their objective will be to achieve aircraft noise levels similar to background noise in urban areas. As the majority of airframes are currently in development there is very little data on noise levels, however, Uber Elevate for example are targeting 67dB at 250 feet altitude.

Community acceptance of UAM activities will also be important as the numbers of aircraft required to simultaneously operate a commercially viable service within urban areas would appear significant compared with the levels of activity of traditional aircraft such as helicopters. Some studies on community acceptance of these aircraft have indicated that where the total number of movements per hour are similar to traditional aircraft the community acceptance is high. In instances where the number of movements significantly exceeds traditional aircraft, e.g. more than 10 times the magnitude the community acceptance is low.

The UAM network proposed by Uber Elevate involves infrastructure that supports busy, multi-modal operations through facilitation of both ground and air transport systems. This means supporting UAM aircraft operations and other transport systems such as electric bikes and scooters, ground vehicle ride sharing, EV charging infrastructure, and connections to public transit.

Once the location of landing and take-off sites are determined, considerations for the landing and take-off sites will include either using existing infrastructure in those locations, which may involve retrofitting of existing structures such as multistorey carparks, or using existing airports/aerodrome facilities and heliports, or greenfield developments, which may include unused land around highway interchanges.

Landing and take-off sites are likely to follow helicopter operations guidelines and standards, including establishing acceptable noise standards for UAM operations where this infrastructure is located.

3.5 Commonwealth environmental legislation

The Australian Government administers the EPBC Act while each state and territory administers its own environmental legislation.

Commonwealth agencies and employees must obtain and consider advice from the Minister administering the EPBC Act before giving an approval/authorisation in relation to the adoption or implementation of a plan for aviation airspace management involving aircraft operations that are likely to have a significant impact on the environment. For example, for conventionally piloted aircraft, the environmental assessment processes that are in place under the EPBC Act are triggered when Airservices examine flight path design changes which are likely to have a significant impact on the environment. This includes consideration of community noise and aircraft emissions. UAM aircraft which operate within controlled airspace would potentially trigger environmental assessment requirements.

3.6 State/Territory/Local government legislation and regulations

State/Territory environmental protection legislation already regulates for noise intrusion into commercial, group centres (major shopping districts) and residential suburbs.

States, territories and local governments are also involved in regulations covering helipad operations, a form of transport that many may equate to the future operations of UAM aircraft.

Some States and Territories have legislation in place that may be capable, in its terms, of applying to noise emitted by aircraft such as drones. However, because of the Regulations, such legislation does not currently apply to noise emitted by aircraft (including drones and UAM aircraft).

Some jurisdictions exclude the regulation of aircraft and leave this entirely as a matter for the Australian Government to regulate at the national level.

As with drones, there is scope for some application of States/Territories/Local government regulations especially in terms of their base of operations being covered under State and Territory planning law. It is also noted that UAM commercial operations in order to achieve economies of scale may require much higher frequency of operations than traditional aircraft.

Accordingly noise regulation of UAM operations will need to consider the total number per day, the total duration, the number per hour and time of flights (day/night). These are relevant considerations when current environmental assessments are undertaken in relation to conventional aircraft operations over communities living near airports or under flight paths.

3.7 Proposed noise regulation of UAM aircraft

Against the regulatory background described in this paper and having regard to future developments of UAM in Australia the department is proposing:

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.***

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).***

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).***

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.***

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.***

Attachment A

Terms of Reference

1. The Review will be undertaken by the Department of Infrastructure, Transport, Cities and Regional Development and consider the appropriate scope and breadth of future noise regulation in relation to the operations of remotely piloted aircraft (RPA) or drones, urban air mobility (UAM), supersonic and historic aircraft.

2. The review will specifically consider:

   (a) the characteristics, nature of these aircraft operations, as appropriate, and their impact on noise exposure, including:

      (i) size, weight and design

      (ii) type of use (e.g. recreational, commercial, special category e.g. emergency services);

      (iii) operational height and location e.g. industrial/residential/rural/remote areas;

      (iv) total number or movements per day and per hour, duration and time of flights (day/night);

      (v) technological developments; and

      (vi) noise characteristics including sound level, tonal qualities and number of noise events.

   (b) the relevance to noise regulation of the aviation safety regulatory requirements and exemptions provided under the Civil Aviation Safety Regulations 1998, administered by the Civil Aviation Safety Authority (CASA);

   (c) the community acceptability of noise impacts of these types of aircraft especially in built up and residential areas;

   (d) noise standards in state, territory and local government including relevant legislation and regulations and their applicability to noise standards for these types of aircraft; and

   (e) international developments at ICAO, the US Federal Aviation Administration (FAA) and the European Aviation Safety Agency (EASA) and other applicable overseas regulators.

3. The review will examine as appropriate whether changes are required to the Air Navigation (Aircraft Noise) Regulations 2018, including considering:

      (i) applicability of aircraft noise regulations to these different types of aircraft including their different characteristics and nature of operations;

      (ii) collected data on sound measurement findings for certain aircraft, including weighted sound pressures to effective perceived noise levels and Sound Exposure Levels; and

      (iii) any future international noise certification of aircraft types such as drones and UAM.

4. The Review report, including recommendations, will be provided for consideration by the Department to the Minister for Infrastructure, Transport and Regional Development.

5. The Review report is scheduled to be completed by 31 December 2019.

Submissions

The Department will be accepting submissions until close of business **Friday 22 November 2019**. Submissions can be made electronically to noiseregulation@infrastructure.gov.au or in writing to:

Aircraft Operations
Aviation Environment Branch
Department of Infrastructure, Transport, Cities and Regional Development
GPO Box 594
CANBERRA ACT 2601

Your submission, including any personal information supplied, is being collected by the Department for the purpose of gathering stakeholder feedback, in accordance with the *Privacy Act 1988* (the Privacy Act). The Department will consider your submission in finalising proposed amendments to the Air Navigation (Aircraft Noise) Regulations 2018.

Your personal information will be stored securely by the Department. It may be used by the Department to make further contact with you about the consultation process. Your personal information will not be disclosed to any other third parties, except in the circumstances outlined below.

Submissions, in part or full, including the name of the author may be published on the Department's website at www.infrastructure.gov.au or in the Government's response, unless the submission is confidential. Confidential submissions (including author name) will not be published. Private addresses and contact details will not be published or disclosed to any third parties unless required by law.

Submissions will only be treated as confidential if they are expressly stated to be confidential. Automatically generated confidentiality statements or disclaimers appended to an email do not suffice for this purpose. If you wish you make a confidential submission, you **must** indicate this by ensuring your submission is **marked confidential**.

Confidential submissions will be kept securely and will only be disclosed in the following circumstances:

- in response to a request by a Commonwealth Minister;
- where required by a House or a Committee of the Parliament of the Commonwealth of Australia; or
- where required by law.

Please direct any queries during these consultations to noiseregulation@infrastructure.gov.au.

The Department may also disclose confidential submissions within the Commonwealth of Australia, including with other Commonwealth agencies, where necessary in the public interest.

Please note that in order to protect the personal privacy of individuals in accordance with the Privacy Act any submissions containing sensitive information, personal information or information which may reasonably be used to identify a person or group of people may not be published, even if not marked as confidential.

The Department's privacy policy contains information regarding complaint handling processes and how to access and/or seek correction of personal information held by the Department. The Privacy Officer can be contacted on (02) 6274 6495.