



Australian Government

**Department of Infrastructure, Transport,
Regional Development and Communications**

Regulation Impact Statement (RIS) for proposed reform to Remotely Piloted Aircraft and electric Vertical Take-Off and Landing (eVTOL) aircraft noise regulations

August 2021



1. RIS for proposed reform to Remotely Piloted Aircraft and electric Vertical Take-Off and Landing (eVTOL) aircraft noise regulations

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Definitions and acronyms

Aircraft	Aircraft means any machine or craft that can derive support in the atmosphere from the reactions of the air, other than the reactions of the air against the earth's surface. (Civil Aviation Act 2018).
Airservices	Airservices Australia is Australia's Air Navigation Service Provider and is a government-owned organisation. It is responsible for the safety of 11 per cent of the world's airspace the safe and efficient management of Australian skies and the provision of aviation rescue fire fighting services at Australia's busiest airports. Airservices works closely with customers and industry to support long-term growth of aviation services.
CASA	Civil Aviation Safety Authority. CASA is a Commonwealth corporate entity that regulates Australian aviation safety and airspace. CASA licenses pilots, registers aircraft, oversees and promotes safety. CASA works with the aviation industry, Department of Infrastructure, Transport, Regional Development and Communications (the Department) and Airservices Australia to achieve a vision of safe skies for all.
CASR	Civil Aviation Safety Regulations 1998
Drone	Remotely Piloted Aircraft System (RPAS). Another common term is an unmanned aerial vehicle or UAV, or an unmanned aircraft system (UAS).
eVTOL	Electric vertical take-off and landing. An eVTOL is an aircraft that can take off, hover and land vertically using an electric propulsion system.
ICAO	International Civil Aviation Organisation is a specialised agency of the United Nations. Its mission is to serve as the global forum of States for international civil aviation. ICAO develops policies and Standards, undertakes compliance audits, performs studies and analyses, provides assistance and builds aviation capacity through many other activities and the cooperation of its Member States and stakeholders.
Operator	A person, organisation, or other legal entity engaged in, or offering to engage in, an aircraft operation.
ReOC	Remotely pilot aircraft operator's certificate. A remotely piloted aircraft operator's certificate (ReOC) issued by CASA that authorises a person (to operate RPA for commercial purposes).
Regulations	Air Navigation (Aircraft Noise) Regulations 2018
RPA	Remotely piloted aircraft.
SOCs	Standard RPA operating conditions (SOCs) – operating limitations expressed in regulation 101.238 of the <i>Civil Aviation Safety Regulations 1998</i> for this RIS.

INTRODUCTION

In June 2019, the Department of Infrastructure, Transport, Regional Development and Communications (the Department) undertook a review of the *Air Navigation (Aircraft Noise) Regulations 2018* (the Review) to determine the appropriate scope of future noise regulation for drones and other specialised aircraft operations. The consultation process and the associated review, informed the development of this Regulation Impact Statement (RIS). The review made a number of recommendations including development of an interim regulatory framework for the management of Remotely Piloted Aircraft (drones) and electric vertical take-off and landing (eVTOL) aircraft noise, and a long-term drone and eVTOL noise framework.

This RIS focusses on the interim solution for noise regulation, which aims to dovetail into long-term framework is being developed as part of the National Emerging Aviation Technology policy (NEAT Policy). The NEAT Policy will support the development of the evolving market, strengthen Australia's leadership in innovation and assist industry to make informed decisions regarding investment with regulatory certainty. It is also essential that the sector grows in a manner that encourages noise reduction, is safe, secure and considerate of the community and the environment. This RIS concentrates on the noise management component of the overarching NEAT Policy.

To strengthen Australia's leadership in the emerging aviation technology and associated regulatory frameworks, a RIS has been developed as next interim step for noise regulation. Australia's market qualities include a rapidly developing drone market with competitive advantages such as world-class research capabilities, established international partnerships, proximity to growth markets and unique geography, climate and expansive land area to support Australia's continued leadership in the drone market and the associated regulation processes.

The interim framework is essential for Australia to remain competitive in the new emerging aviation technology market that includes drones and eVTOL. Australia must simultaneously move swiftly and take a considered approach to amending and developing regulatory frameworks to support compliance and not to be a barrier to the growing market.

The interim framework is required as systems such as the unmanned traffic management system (UTM) which could support improved noise management for drone operations in the long-term may not be fully developed for several years.

Regulatory reform is the main part of the interim noise framework. There is a need to review and as necessary amend existing regulation to ensure the relevant noise-related risks from emerging aviation technologies are managed in an outcome focused, transparent and proportionate manner.

Aircraft noise management is currently addressed under the *Air Navigation (Aircraft Noise) Regulations 2018* (Regulations) which includes noise standards and testing procedures for certain aircraft. There are no specific standards or noise accreditation procedures for drones in the Regulations. Currently, drone noise is being managed under section 17 of the Regulations which provides approval for other aircraft to which no standards apply.

The key issue this RIS is seeking to address is that noise management under the current Regulations were drafted to suit traditional aviation aircraft and do not adequately account for new aviation technology such as drones and eVTOL aircraft. The unintended result is the potential for a high rate of non-compliance with the Regulations among drone operators. Amending the Regulations to account for the unique operating characteristics of drones and eVTOL aircraft, could support industry growth and lead to greater clarity and certainty for operators and the community. Furthermore it would provide assurance that drone noise is being considered in a transparent way and is taken into account.

This RIS outlines four options for the management of drone noise under the Regulations. The RIS also includes information regarding the:

- challenges facing drones and eVTOL aircraft operations.
- need for Australian Government action.
- policy options.
- likely net benefits of each option.
- proposed preferred option.

Other issues

There are several issues that are beyond the scope of this RIS, including safety regulation, security issues and the privacy impacts of emerging aviation technologies.

In addition, under the Regulations:

- state aircraft, hot air balloons and propeller-driven aircraft specifically designed for exclusive use in aerobatic purposes, fire fighting purposes, agricultural operations or environmental operations are excluded (section 5 Application (2)).
- **Model aircraft** are effectively defined as recreational drones under the Civil Aviation Safety Regulations 1998 (CASR).

It is important to note that any amendments to noise impacts in the Regulations **do not confer exemption from other laws, regulations and procedures such as Occupation Health and Safety Act 2004 and regulations and the Privacy Act 1988.**

HAVE YOUR SAY

The Australian Government invites written submissions on any aspect of the options proposed within this paper.

To guide the development of submissions, you may wish to consider the following questions:

- Which option best aligns with the direction of your business/organisation or personal interests?
- Are there any other options that could benefit the emerging aviation technology sector?
- What level of regulation do you expect from the Government?
- What are your expectations about the extent of the Government's role and responsibilities in the management of drone and eVTOL aircraft noise?
- How important is compliance with regulations to you?
- Would any of the options be unachievable, place an unreasonable burden on your business/organisation or result in you leaving the industry?
- What benefits/opportunities do new aviation technologies offer for Australia?
- What role does appropriate regulation play in Australia's ability to realise these opportunities?
- To what extent should Australia seek to harmonise our approach to noise regulation with international approaches?
- Are there other issues that the Australian Government should consider?

Submissions or questions should be provided no later than 4 October 2021 to:

Director, National Emerging Aviation Technologies Policy

Department of Infrastructure, Transport, Regional Development and Communications

Email: NoiseRegulation@infrastructure.gov.au

Alternatively, send via post to: GPO Box 594, CANBERRA ACT 2601

BACKGROUND

Drone and eVTOL aircraft operations

Drones and eVTOL aircraft are emerging and innovative aviation technologies. Drones are already being used in a range of activities, including the agricultural sector, emergency services, infrastructure inspections and surveys, surf lifesaving, delivery of medical supplies, aerial photography and commercial and residential deliveries. There is great potential for eVTOL aircraft to be used for passenger and cargo transportation, either autonomously or with a pilot. Numerous eVTOL aircraft prototypes are under development globally, however these aircraft are not currently operating commercially in Australia.

There are many examples of Australia leading the way with world first operations. Swoop Aero has been delivering vaccines in hard to reach places such as Vanuatu¹ and the Little Ripper Lifesaver has been tailored for search, rescue and lifesaving operations including shark and crocodile spotting, and deploying rescue devices². There has also been rapid growth in agricultural applications with drones being used to conduct power line surveys, for agricultural spraying and in aerial mustering in regional and remote areas.

Wing Aviation has been operating its drone delivery service in Australia since 2017. Following a trial period in the Australian Capital Territory, Wing commenced commercial operations in the Canberra region in 2018 before expanding to Logan in Queensland in 2019³.

At the end of 2020, over 2,000 operators held a Remotely Piloted Aircraft (RPA) Operator's Certificate as one of the ways to permit commercial drone operations. The alternative means to conduct commercial operations is to operate under the Excluded RPA category that permits simple commercial operations, such as videography and is dependent on the aircraft weight. It is estimated that there were over **15,000 Excluded RPA operators** at the end of 2020.

There is currently less certainty around the number of recreational drones in operation. Based on sales over the last three years, the number of recreational drones is estimated to currently be over 1 million. It is envisaged that most recreational drone users will be required to register their drones by mid-2022. Some recreational drones however, will not require registration. Registration became a requirement for all drones operated commercially on 28 January 2021. This RIS proposes amendments to the Regulations to provide more regulatory certainty for operators about noise requirements.

Future opportunities

Emerging aviation technologies such as drones and eVTOL aircraft will significantly benefit the Australian economy and have the potential to **transform** the aviation sector, transportation, health

¹ Swoop Aero. *The world's first two-way medical drone logistics network in Vanuatu*. [online]. Available at: <https://swoop.aero/stories/vanuatu> [accessed 8 April 2021]

² The Ripper Group International. *The Little Ripper Life Saver*. [online]. Available at: <https://thelittleripper.com.au/> [accessed 6 April 2021].

³ Wing. *Celebrating one year of drone delivery in Logan*. [online]. Available at: <https://blog.wing.com/2020/09/celebrating-one-year-of-drone-delivery.html> [accessed 8 April 2021]

services and mobility and settlement patterns over coming decades. The predicted growth of the sector will provide more jobs and opportunities for small businesses to diversify and adopt new technology to carry out tasks in a safer and more efficient way.

Recent research commissioned by the Australian Government found that following a medium-growth scenario, new aviation technologies could add \$14.5 billion to gross domestic product (GDP) over the next 20 years and create around 5,500 additional jobs (full-time equivalent). This includes over \$4.4 billion in GDP for regional Australia and cost savings of \$2.95 billion for the agriculture, forestry and fisheries sector, \$2.45 billion for mining and \$1.34 billion for construction⁴.

Given this predicted growth and to ensure Australia can fully realise the benefits of this new technology, Australia must adopt an approach that is flexible enough to minimise the noise impacts of these aircraft and can evolve as the technology inevitably evolves. Countries across the world are currently grappling with these issues. Some countries are more advanced in their approach and have incentives in place for testing and trialling of new technology. To be competitive in this market, Australia must move swiftly and take a considered approach.

Through collaboration with industry via programs such as the Emerging Aviation Technology Partnerships Program, the government is seeking to support the use of emerging aviation technology as a means of meeting community needs. Not only will this fast-track Australia's ability to unlock the projected economic benefits, it will also create jobs and boost efficiency and reduce emissions as outlined in the NEAT Policy statement.

Regulatory oversight

Noise regulation for conventional aircraft is largely established through International Civil Aviation Organization (ICAO) standards and this has been the basis for the current Australian regulatory approach. However, there are currently no ICAO aviation noise standards for drones and eVTOL aircraft⁵.

The Department administers the Regulations which are made under section 26 of the *Air Navigation Act 1920*.

A key requirement under the Regulations is for certain aircraft to hold either a noise certificate or an approval to operate⁶ without the certificate. Under the Regulations, drones and eVTOL aircraft are classified as 'aircraft' and are therefore subject to this requirement, to the extent the aircraft engages in or affects:

- international air navigation.
- air navigation conducted in relation to trade and commerce with other countries and among the States.

⁴ Deloitte Access Economics, *Economic Benefit Analysis of Drones in Australia, Final Report, 2020*, <https://www.infrastructure.gov.au/aviation/technology/files/economic-benefit-analysis-of-drones-to-australia-final-report.pdf>

⁵ International Civil Aviation Organization. *ICAO Model UAS Regulations*. [online]. Available at: <https://www.icao.int/safety/UA/Pages/ICAO-Model-UAS-Regulations.aspx> [accessed 6 April 2021]

⁶ Australian Government Federal Register of Legislation. *Air Navigation (Aircraft Noise) Regulations 2018*. [online]. Available at: <https://www.legislation.gov.au/Details/F2019C00285> [accessed 2 April 2021]

- air navigation conducted by a constitutional corporation.
- air navigation within a Territory or to or from a Territory.
- air navigation that consists of landing at, or taking off from, a Commonwealth place.
- air navigation in which a Commonwealth aircraft is engaged.

Furthermore, most drone and eVTOL aircraft are not constrained by the same geographical positioning and limitations as **traditional aircraft**, which adds complexity to the traditional measurement of noise impact and exposure.

Drones operated for recreational or commercial purposes are subject to aviation safety regulations that include limitations on where drones may be operated (for example, the distance away from airports and built-up areas, height restrictions and other operating procedures⁷).

In addition to aviation specific legislation, environmental legislation also covers noise impacts. The Commonwealth administers the *Environmental Protection and Biodiversity Conservation Act 1999*, while each state and territory administers its own environmental legislation.

PROBLEM IDENTIFICATION

Under the Regulations, noise impacts from drones and other emerging aviation technologies are **treated under the same framework as traditional aircraft noise**. The Regulations do not provide an effective framework for managing the noise associated with drone operations and are not considered fit-for-purpose. Appropriate, flexible amendments to the Regulations tailored for drone users, have the potential to increase compliance, reduce unnecessary administrative burden and encourage growth in the industry by providing certainty to users and the community.

Drones and eVTOL aircraft are part of an emerging market, and despite rapid growth in recent years the sector has only realised a fraction of its economic potential. As the market grows there will undoubtedly be further opportunities and growth in the number of services that can be provided⁸.

However, risks and impacts associated with noise and other issues will also continue to emerge and may increase in significance. For the industry to thrive, the regulatory approach needs to be as flexible as possible to minimise the costs for operators and their customers.

The key issue this RIS is seeking to address is that the current Regulations were drafted to suit traditional aviation and do not adequately account for new aviation technology such as drones and eVTOL aircraft. The unintended result is a high rate of non-compliance with the Regulations among drone operators. If not addressed, industry growth could be stifled due to a lack of clarity and certainty for operators.

⁷ Civil Aviation Safety Authority. *Drone Safety Rules*. [online]. Available at: <https://www.casa.gov.au/drones/rules/drone-safety-rules> [accessed 2 April 2021].

⁸ Deloitte. *Economic Benefit Analysis of Drones Australia*. [online] Available at: <https://www.infrastructure.gov.au/aviation/drones/files/economic-benefit-analysis-of-drones-to-australia-final-report.pdf> [accessed 2 April 2021]

A secondary problem is that the perception of drone noise is quite subjective and there are currently **no standards against which to measure drone noise**. This presents challenges when developing policies around the management of drone noise.

The following section outlines key problems associated with the management of drone noise in more detail, noting many of the problems are interrelated and difficult to separate.

Problem 1: Current regulations are not fit for purpose

Current aircraft noise regulations were designed for traditional aircraft and focus on managing noise impacts around aerodromes. Under the Regulations traditional aircraft (e.g. jet and propeller aircraft/helicopters), drones and eVTOL aircraft are all defined as 'aircraft' meaning these vastly different types of aircraft have the same requirements. As a result the emerging aviation technology sector is somewhat constrained by a traditional approach to noise regulation (e.g. decibel limits and noise certification for different classes of aircraft, curfews and movement caps at some airports and requirements to conduct community engagement in flight path design) that suits traditional aviation but not new types of aviation technology and operating models.

The most obvious example is the requirement under the Regulations for aircraft to have a noise certification or approval from this requirement. There is currently no process for drones and eVTOL aircraft to obtain noise certification, and no criteria or guidance on how approvals should be applied for these aircraft. Furthermore there is no standard against which to measure drone noise.

When granting approvals to-date, the Department has used an application process similar to that used for historical and adventure aircraft, noting this process was not designed for the unique noise profile of drones and eVTOL aircraft. This process utilises section 17 "Approval for other aircraft to which no standards apply" of the Regulations. While some approvals have been granted, the majority of drone operators are operating without a noise certificate or an approval, and are therefore non-compliant with the Regulations.

Problem 2: Inconsistent current legislation and regulation

There are various pieces of Commonwealth, state and territory legislation and regulations covering aviation noise. There are also inconsistencies in the application of the Regulations across the states and territories noting the Regulations do not apply of its own force or by force of state law in all states (specifically Queensland and Victoria).

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

If not addressed, inconsistency across jurisdictions will reduce interoperability, enforcement and compliance and impact operators wishing to operate across borders or in multiple jurisdictions. Different rules, requirements and allowances increase compliance burdens on operators and their operations.

Problem 3: Community acceptance of drone and eVTOL operations

Perception is critical when it comes to defining drone noise. Noise is highly subjective. The complexities of people and their reactions to sound in a given scenario are difficult to predict. This makes assessing the impact of noise and determining appropriate solutions, including the setting of standards, difficult⁹.

The public may be willing to accept an inconvenience like drone noise if it is linked to activities they desire and their understanding of the purpose of the drone services and recreational activities is increased. The public may embrace the new technology and transport modes.

This is easily illustrated by the public acceptance of helicopter noise near a trauma hospital, when in other settings it may trigger complaints. Furthermore, if a drone cannot be easily identified, the public do not know if is delivering life-saving medicines, or making a food delivery.

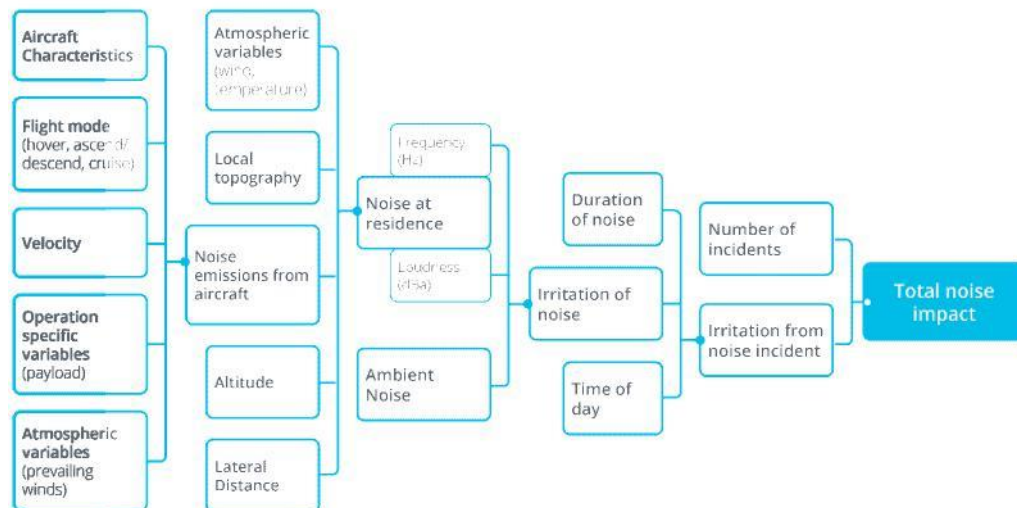
Commercial businesses can help mitigate these issues by being proactive with community outreach to ensure the community understands the purpose of their operation. Feedback gained through outreach can also lead to modification of operations where it is possible to address community concerns through things such as dynamic routing. These approaches enhance the likelihood of drone operations being accepted and commercially viable in communities.

Problem 4: Ground based impact of drones and eVTOL aircraft noise

Traditional approaches to noise management includes setting limits on the noise emissions from aircraft and mitigating impacts around aerodromes through flight path design. This approach does not accurately reflect the actual noise impact for drones or eVTOL aircraft, leading to an increasing risk of regulations that are either unnecessarily restrictive for operators, or ineffective in ensuring drones operate within community expectations regarding noise impacts.

A large number of variables determine the noise impact from a drone or eVTOL aircraft. The following diagram provides an example of the number of variables that combine to determine the total noise impact for a particular ground-based location.

⁹ Kloet, N., Watkins, S., and Clothier, R. (2017). *Acoustic signature measurement of small multi-rotor unmanned aircraft systems*. International Journal of MicroAir Vehicles 9(1).



A number of **environmental variables**, including distance, affect how much noise is experienced at a point on the ground. The total number of variables combine to give an overall level of noise impact and this cumulative impact element is extremely important. Occasional or one-off noise occurrences, even if moderately loud, generally do not generate much concern. Frequent and regular noise tends to generate the most concern, and varies by time of day.

As the sector develops, there is expected to be increasing variance in the size and function of drone and eVTOL aircraft operations. For this reason, drone and eVTOL noise is being considered as part of a **single framework**. Trying to draw a distinction between classes of aircraft (based on size, weight, altitude and noise output) and regulating these aircraft types differently would create new challenges. It could also likely result in overlapping or inconsistent regulatory frameworks that are not effective in managing the total noise impact from different aircraft operations.

Problem 5: Measurement of drone and eVTOL aircraft noise

Most drones currently in use emit less noise (typically between 55dB and 69dB) than most other aircraft (typically between 65dB and 95dB¹⁰) or road vehicles, however they emit an atypical noise at an uncommon frequency that is often described as ‘annoying’¹¹. This has raised concerns in some communities and has been a matter of focus in recent discussions on drone regulation in Australia¹².

The operating profile of a drone tends to be:

- significantly quieter with a more contained noise profile than traditional manned aircraft; and
- more agile within a smaller operating volume.

¹⁰ Airservices Australia (n.d.). *Measuring aircraft noise*. [online] Available at: <https://aircraftnoise.com.au/causes-of-aircraft-noise/measuring-aircraft-noise/> [accessed 11 May 2021].

¹¹ John A. (2017). *What's the Buzz*, RAND Corporation. [online] Available at: <https://doi.org/10.7249/RR1718> [accessed 2 April 2021]

¹² Queensland Government. (2018). *Queensland Drones Strategy*. [online] Available at <https://www.premiers.qld.gov.au/publications/categories/plans/queensland-drones-strategy.aspx> [accessed 6 April 2021]

There are different forms of sound measurement that can be used in the analysis of aviation noise. These range from weighted sound pressures to effective perceived noise levels through to the Sound Exposure Level¹³. However measurement of drone noise is not entirely straightforward and the impact of drone and eVTOL aircraft noise is further influenced by the environment in which the aircraft is operating and the conditions on any given day.

While there is no easy single measurement tool or threshold, it is possible to obtain a noise measurement via an acoustic specialist, however the associated costs are high (approximately \$120 per hour). This may be appropriate of a large-scale operator with a large noise impact but is not a reasonable request of a recreational or small-scale commercial operator. The Regulations do not make a distinction between types of operators, again highlighting the inflexibility and unsuitability of the Regulations when applied to drones and other emerging aviation technology.

Problem 6: Complaints Management/Enforcement

Noise complaints related to drones are challenging as they are often combined with issues such as privacy and environmental impacts, as well as personal opinions on drone use in general.

A number of Commonwealth agencies have a role to play in the management of drones and eVTOL aircraft and there are many avenues for submitting drone noise complaints. This can lead to confusion around which agency is responsible for handling noise complaints.

Currently, complaints and concerns can be directed to the individual or commercial operator, if known. It is important to note that safety related concerns are addressed by CASA. The Department also takes complaints as does the Noise Complaint Information Service (NCIS) managed by Airservices Australia. Refer to https://www.aviationcomplaints.gov.au/aircraft-noise#The_complaint_process.

In 2020, the NCIS recorded 30 general drone noise complaints with 7 general drone noise complaints recorded this year between January to April. This number is relatively minimal given there are estimated to be over 1 million drones in operation across the country, noting this number does not include complaints submitted directly to operators or via other avenues.

Resolving a drone noise complaint can be challenging if the operator is not easily identifiable. Commercial operators may be identified based on the company's operating conditions, locations and design of their drone. However, identifying the operator of a recreational drone is not as straightforward.

As technology advances and with the introduction of drone registration and systems such as unmanned traffic management and remote identification (which provides limited identifying information about a drone operator), investigating noise complaints should become easier. As this technology is not likely to be implemented for a number of years, a process is required in the interim for investigating and resolving noise complaints.

¹³ Cabell, R., McSwain, R., and Grosveld, F. (2016). *Measured Noise from Small Unmanned Aerial Vehicles*. Conference paper, Noise-Con 2016, Rhode Island. [online] Available at <https://ntrs.nasa.gov/api/citations/20160010139/downloads/20160010139.pdf> [accessed 8 April 2021]

CURRENT MEASURES TO ADDRESS THESE PROBLEMS

Currently, the Department can, in certain circumstances, issue drone and eVTOL operators an approval to operate without a noise certificate under section 17 of the Regulations. Currently there are no commercial eVTOL operators in Australia. Approvals are typically issued in situations where the operator may have a significant noise impact on the community. Approvals can include a number of operating conditions to ensure operator flexibility while balance community needs/concerns. Conditions on operations can include matters such as:

- Limited days and/or hours of operation.
- Requirements to notify the department before commencing operations in new locations.
- Requirements to report numbers of flights.
- Requirements to report community feedback and complaints.
- Limitations on numbers of flights per day (only where necessary to ensure noise impacts remain acceptable to the community).

THE NEED FOR GOVERNMENT ACTION

Government action is required as the current framework is not fit-for-purpose and was not intended to cover drone and eVTOL operations. The Government is seeking to ensure industry specific regulations are established that are both achievable and appropriate for the industry and broader community.

As regulatory change is complex and as the industry is still emerging, an interim solution is required while a longer-term approach is being developed as part of the NEAT policy framework¹⁴.

POLICY OPTIONS

This RIS considers four options:

1. **No change to the Regulations.**
2. **Deregulation of the drone industry** – exclusion of drones and eVTOL aircraft from the Regulations.
3. **Reform the Regulations** – to include flexible and fit-for-purpose drone and eVTOL requirements.
4. **Establish classifications under the Regulations** – establish a benchmarking tool for all drones and eVTOL aircraft.

¹⁴ The Department of Infrastructure, Transport, Regional Development and Communications. *National Aviation Policy Issues Paper on Emerging Aviation Technologies*. [online] Available at: <https://www.infrastructure.gov.au/aviation/drones/files/drone-discussion-paper.pdf> [accessed 2 April 2021]

Option 1 – No change

The Government has the option of not amending the Regulations. However, this does not address the problems identified and would continue the prohibitive requirement for a noise certificate or an approval under Division 3 of the Regulations to operate without a certificate for certain drone operators.

If Option 1 is the preferred option, the Department would need to take steps to increase compliance and if necessary introduce enforcement measures. This means most drone operators, would need to apply for an approval to operate without a noise certification.

While there would be no change to the Regulations, administrative burden would increase for operators as the Department would need to better enforce the Regulations. Likewise, while no new costs are being introduced, an increase in enforcement would result in an increase in indirect regulatory costs (time spent on application, not a direct application cost).

Division 3 of the Regulations do not prescribe a formal process to apply for an approval, however the general process that has been followed to date is outlined below:

Step 1: Contact the Department

Provide the following detail:

- Operator details.
- Aircraft make/model.
- Maximum take-off weight (kgs).
- Description of proposed operation.
- Area/s of operation.
- Proposed times of operation (daylight hours/weekdays).
- Consultation and notification of operations to the community and relevant authorities in proposed area of operations.
- CASA Instrument of Approval for unmanned aircraft in an approved area reference number, in accordance with the Civil Aviation Safety Regulation 1998 reg 101.030.
- Noise measurements from an acoustic expert as confirmed by Airservices.

Step 2: Assessment of application

The Department assesses application and negotiates any operating conditions.

Step 3: Noise certificate approval is issued

The Department issues an approval to operate without a noise certificate, which requires quarterly reporting of movements and complaints. Reporting requirements and operating conditions may be increased if community tolerance is unfavourable.

Step 4: Modification or revision

Modifications to the approval would need to be sought if there were proposed updates to the previously agreed operations or if the aircraft is modified. Reapplication must be sought annually.

Option 2 – Deregulation

Option 2 proposes that the noise impacts from the drone and eVTOL industry could be completely deregulated. This would remove all requirements around noise certification and approval to not have noise certification and effectively exclude drones and eVTOL from the Regulations.

The benefit of this option would be less administrative burden for operators. It would also resolve the current issue with non-compliance.

The drawback however, is that full deregulation creates the potential for irresponsible operators to enter the market, without regard for their noise impact. Given the sensitivities around drone noise, one irresponsible operator could tarnish the whole industry and undo the goodwill generated with communities through extensive outreach by responsible operators. Without some level of regulation in place, the Government would have no recourse for managing such a scenario.

The absence of the Commonwealth's leadership in regulation may see jurisdictions implement alternative regulatory mechanisms resulting in inconsistencies across jurisdictions making compliance complex for operators.

Furthermore, the lack of appropriate regulatory oversight may impede and discourage international investment and would lead to inconsistent treatment compared to traditional aviation.

Option 3 – Flexible reform

The Regulations could be amended to implement a flexible regulatory approach to better account for emerging aviation technology. Amendments would remove requirements for approvals for drone and eVTOL operations unlikely to have a significant noise impact on the community. Drone and eVTOL operations likely to have a noise impact may require approvals subject to conditions designed to mitigate noise impacts.

This would be implemented using a flexible approach that allows for management of noise impacts on a case-by-case basis. This approach would be sustainable for operators, promote industry innovation, encourages operators with a significant noise profile to be accountable for their noise and balances the needs of the community. While this is an interim solution, it is likely to be an iterative process with further potential variations occurring over time to stay in touch with the emerging market.

If adopted, this option could fulfil the recommendation of the Review for an interim drone and eVTOL noise solution – with a view that a more comprehensive longer-term noise framework (that captures drone operators and potentially eVTOL operators) will be developed as part of the NEAT policy framework. This flexible interim approach would provide drone users with clearer noise regulatory processes, improving compliance and providing greater certainty to industry.

It is likely that the long-term solution would require further changes to the Regulations and would be subject to a separate RIS process.

Proposed interim framework

The framework would:

- Be based on noise risks and focus on operations that are likely to have a significant noise impact (due to location of operations, frequency and density of aircraft operations and noise output of aircraft).
- Be flexible and proportionate, to reflect a range of different concepts of operation for drones and eVTOL aircraft.
- Allow operators the opportunity to refine their concepts of operations to reduce noise impacts where they occur.
- Encourage continuous improvement by operators to reduce noise impacts.

The framework would include consideration of:

- Noise impacts during operations, with a view to establishing comparable measurements.
- Community feedback mechanisms, to ensure that local community sentiment regarding drone and eVTOL operations can be effectively monitored.
- Operating limits (such as time of day, operating distance, volume of flights), where necessary, to ensure noise impacts remain within levels acceptable to the local community.

Applicability

The Regulations could be amended to create specific approval processes for drone and eVTOL operations. Some drone operations would not be required to seek an approval.

Examples of operations not requiring an approval include:

- Recreational drone operations.
- Commercial operations within the standard operating conditions.
- Drones and potentially eVTOL used by emergency services and other categories of operations as deemed appropriate.
- Drones weighing under 250g.

Proposed application process

Changes could be made to the Regulations to outline an application process for other drone or eVTOL operations to obtain an approval to operate under the noise regulations.

This indicative approach to option 3 may be finessed after public consultation. Some definitions may need to be refined to support this flexible approach.

Step 1: Self-assessment

Step 1 would consist of a self-assessment process where operators determine whether they need to continue to Step 2 and seek an approval. This process would use criteria to determine whether their operations would be likely to have a significant noise impact on the community. This would include factors such as:

- The noise sensitivity of the area in which operations occur (for example, residential areas, public parks).

- Whether the operation takes place over the operator's own land.
- The frequency of operations in a particular area.
- Noise mitigation strategies being used by the operator.
- The noise output of the drone.

Operations that are unlikely to have any significant noise impact would not require an approval. Operations that may have an impact would be required to proceed to step 2 and apply for an approval.

Where an operator has self-assessed as not requiring an approval, the operator may still be required to provide further information or seek an approval if the Department deems it to be necessary.

Step 2: Application process

The operator would apply to the Department for an approval. The application would include information such as:

- Operator details.
- Aircraft make/model.
- Maximum take-off weight.
- Description of proposed operation.
- Area/s of operation.
- Proposed times of operation (daylight hours/weekdays).
- CASA Instrument of Approval for unmanned aircraft in an approved area reference number, in accordance with the Civil Aviation Safety Regulations 1998 reg 101.030, if one is held.

Where this information is contained within ReOC applications, applicants can provide their ReOC application.

Step 3: Initial assessment of application

The Department determines if the application includes enough information or if further information is required. This also provides an opportunity for further quality assurance processes.

If it is determined that enough information has been provided, proceed to Step 5.

Step 4: Additional information provided (if required)

If more information is needed for a full application process, additional information would be sought, which may include:

- Details on the consultation undertaken and notification of operations in proposed area of operations (including consultation with local councils).
- Noise measurements from an acoustic expert.

Step 5: Approval (including conditions)

The Department assesses the application and grants an approval to operate without a noise certificate. Approvals may include operating conditions as necessary to ensure the noise impacts from the applicant's drone operations (or eVTOL operations) remain within a level that is acceptable to the community (such as restricted days and hours of operations, operating locations areas/suburbs).

Approvals may also include reporting requirements (including number of flights and details of complaints received) to allow the Department to maintain oversight of the operation and community reaction.

Modifications to the application may need to be sought if operators change the nature of their operations which could lead to an increased noise impact.

Approvals would typically have a duration of 12 months, unless special circumstances apply.

Option 4 – Classification standards

Standards and classifications of drone and eVTOL aircraft noise could be used to both inform operators of their impact and protect sensitive areas. This option proposes developing a drone-noise-classification tool to classify drone and eVTOL aircrafts according to their noise profile and would be the basis for issuing an approval to operate without a noise certificate.

The proposed method of benchmarking revolves around determining allowable noise levels based on the land-use-areas affected and noise level of similar appliances. The application of “land-use-area” in determining noise compliance could enhance operations (allowing noisier drone operations) but could also add undue complexity to the airspace, making operational requirements/compliance unnecessarily complex.

The proposed drone noise classification tool could take into consideration the type of drone and eVTOL operations undertaken and weight limits. Therefore:

- Operations under current SOCs would not require drone noise classification.
- Operations would only be drone noise classified where a drone or eVTOL weight-criteria is exceeded and/or
- The drone and eVTOL operations revolve around delivery and high density operations.

The drone and eVTOL aircraft weight would align with the CASA definitions of micro, very small, small, medium and large¹⁵.

The drone-noise-classification tool should be based on the specific flight characteristics of the aircraft such as take-off, landing, slow-stationary flight and rapid movement operations. The tool should take acoustic weighting and the potential for tonal characteristics into consideration rather than use a generic comparable noise value e.g. noise from a lawn mower (can vary between 40dB and 85dB), which has only one function and tone (versus a drone which has many functions, operating abilities and tones) (ranging from 55dB to 69dB).

Localised ground-based noise limits could be set having regard to the surrounding environment and needs. This will serve to **set a noise standard at ground level**, giving drone and eVTOL operator’s greater flexibility in how they meet the standard through aircraft design (quieter drones), dynamic

¹⁵ The Civil Aviation Safety Authority. *Types of drone*. [online] Available at: <https://www.casa.gov.au/drones/rules/drone-types#:~:text=Size%20categories%20%20%20Size%20%20,to%20150%20kg%20%201%20more%20rows%20> [accessed 30 April 2021]

routing, and operating altitude. Ensuring operations are conducted consistent with the various ground based levels would provide certainty for drone and eVTOL operators and the broader community.

It is expected the tool would not apply to drone operations with minimal noise impacts, applying only to larger eVTOL aircraft or aircraft that operate in high-trafficked areas.

This option could increase regulatory complexity as setting noise limits based on classes of aircraft is **problematic given the rate at which technology is advancing**. Additionally, once a limit is set, the incentive for companies to keep innovating to reduce the noise emissions from their aircraft is removed. For example, if the certification requirement for a type of drone is set at 65-decibels, it is likely the market will be filled with 65-decibel drones given there is no incentive to make them quieter.

Linking noise classifications to ground impact could also discourage competition. If one drone or eVTOL aircraft is operating in an area at the maximum tolerated classification level there is little to no space for competitors to enter the same airspace. In a situation such as this, the original drone operator could potentially be discouraged from making their drone quieter as a means of keeping competitors out of the same airspace.

Application process/categorisation tool

Initially an agreed drone-noise-classification tool would need to be established. This would need to be agreed across jurisdictions with relevant regulatory/legislative powers and reflected in the Regulations. It is likely that an ICT tool would need to be developed for this complex system and it would be a resource intensive process for development and implementation of option 4.

The proposed process for applying for a noise certificate as per a classification is outlined below.

Step 1: Establish requested operations

Establish if the drone/eVTOL aircraft fits within the exempted categories:

- Operations under current SOCs should not require drone noise classification.
- Other operations should only be noise classified where a drone or eVTOL weight-criteria is exceeded and/or
- The drone and eVTOL operations revolve around delivery and continuous high density operations.
- The aim is to encourage noise level reductions from relevant commercial emerging aviation technology.

If one of the above categories are met, a noise certificate/approval is not required.

If the operation does not meet the above, proceed to Step 2.

Step 2: Establish noise measurements

The Department would request operators to provide noise measurement data for their aircraft from an acoustic expert. Measurements should be based on the specific flight characteristics such as takeoff, landing, slow-stationary flight and rapid movement operations, having consideration for acoustic weighting and potential for tonal characteristics, particularly for eVTOL systems.

This data would correlate with the established and agreed drone-noise-classification tool.

Step 3: Application process

Contact the Department and provide information required for Step 1 and 2 in addition to the information below:

- Operator details.
- Aircraft make/model.
- Maximum take-off weight (kgs).
- Description of proposed operation.
- Area/s of operation.
- Proposed times of operation (daylight hours/weekdays).
- CASA Instrument of Approval for unmanned aircraft in an approved area reference number, in accordance with the Civil Aviation Safety Regulation 1998 reg 101.030, if one is held.

Where this information is contained within ReOC applications, applicants may be provided to the department their ReOC application.

Step 4: Assessment of application

The Department assesses application and negotiates any operating conditions.

Step 5: Noise certificate issued

Noise certificate would have standard reporting requirements. Reporting requirements and operating conditions may be increased if community tolerance is unfavourable.

Step 6: Modifications or revisions

Modifications to the application would need to be sought if the aircraft is modified which may change which classification the aircraft could be classed in. Reapplication would need to be sought annually initially but mechanisms will be established for longer-term approvals as needed.

IMPACT ANALYSIS

Conservative estimates of the regulatory costs and savings associated with each option have been provided.

In line with the Office of Best Practice Regulation's Regulatory Burden Measurement Framework, opportunity costs have not been included or considered. The total average annual regulatory costs (from business as usual) are included in the regulatory burden estimate (RBE) table in [Appendix 1](#).

The assumptions used to derive these cost estimates are outlined below:

- Business number assumptions relate to those small, medium and large businesses¹⁶ currently in the market and expected growth over the next 10 years.
- For those businesses or community groups completing the applications processes for commercial use the default hourly cost is based on average weekly earnings, but adjusted to

¹⁶ As defined by the Australian Taxation Office definition e.g. small businesses is a business that has an aggregated turnover (excluding GST) of less than \$2 million.

include income tax.¹⁷ This provides an economy-wide value for employees of \$41.74 per hour.¹⁸ This value needs to be scaled up using a multiplier of 1.75 (or 75 per cent as it is input into the Regulatory Burden Measure) to account for the non-wage labour on-costs (for example, payroll tax and superannuation) and overhead costs (for example, rent, telephone, electricity and information technology equipment expenses). This results in a scaled up rate of \$73.05 per hour (\$41.74 multiplied by 1.75). This default should be used in cases where regulation cuts across a number of sectors, or where more appropriate labour rates are unknown or would add undue complexity to the costing process.

- For those businesses or community groups completing the applications processes, the noise measurement wage assumption has been doubled as it assumes acoustic experts and specialists will need to be engaged and paid for their services.
- Initially, noise testing would be a start-up cost however, additional testing may be required if significant modifications were made to the drone or eVTOL aircraft. This would only be necessary for businesses and community organisations as it is assumed recreational operators are unlikely to require noise approvals.
- For individuals completing the application processes for their recreational drone or eVTOL the default value that should be used for an individual's leisure time is based on average weekly earnings and has been estimated at \$32 per hour.
- As a delay cost has to be assumed in application processes, the delay is only estimated to be one day. This assumption has only been applied to businesses and community organisations given a delay could potentially result in a loss of revenue. Individuals would not have a monetary loss if a delay were experienced.

Option 1 – No change

Positive Impacts

- Potential for increased compliance.

Negative Impacts

- Most requirements are unachievable and cost prohibitive for smaller drone operators (recreational and commercial) with start-up costs approximately \$7,000 and close to \$1,000 in ongoing costs.

¹⁷ Average weekly earnings estimates are published by the Australian Bureau of Statistics (ABS) before tax.

¹⁸ Based on [ABS Cat. No. 6306.0 Employee Earnings and Hours, Australia, May 2018](#). Data Cube 13 - Average weekly total cash earnings and hours paid for: full-time non-managerial employees paid at the adult rate (weekly ordinary time). Calculated using the [ATO's online Simple Tax Calculator](#), 2017-18 tax rates.

- Requirement for certain drone operators to hold a noise certificate exemption would be enforced for all drones and eVTOL aircraft would mean an increased burden on commercial operators and some individuals (except individuals in QLD and VIC).
- The drone industry may not increase at the expected rate (anticipated growth of \$14.5 billion in GDP over the next 20 years and an additional 5,500 jobs) as new entrants, including international investors, may be deterred due to onerous compliance requirements.
- Significant increase in administrative burden for authorities to issue approvals under section 17 of the Regulations.

Stakeholder Impacts

This option continues with the current regulatory framework but would **increase** regulatory impacts. It also has other significant flow-on impacts, for example, on the economy (reduction in projected industry growth), competition (may prevent new entrants to the market), and society (may prohibit new beneficial drone applications).

This option has large administrative and compliance requirements.

Requirements:

- Approval process for **certain** drones and eVTOL aircraft – annually.
- Delay costs – annually for businesses and community organisations.
- Noise testing – assumed for businesses and community organisations (not individuals) as a start-up cost but would need to be redone if significant modifications were made to an aircraft.
- Reporting – monthly for businesses and community organisations, individuals would have to record data and provide only upon request.

Table 1: Total regulatory impact of Option 1

Option name	No Change
Option description	Continuation of current noise regulations
Businesses affected	35 inclusive of small, medium and large businesses (estimate based on current numbers and expected growth)
Individuals affected	All drone operators except in QLD and VIC (approximately 750,000)
Community organisations affected	15 (estimate based on current numbers and expected growth)

	Cost per business	Total cost for all business	Cost per individual	Total cost for individuals	Cost per community organisation	Total cost for all community organisation
Start-up cost	\$7,342	\$256,953	\$32	\$24,000,000	\$7,342	\$101,123
Ongoing compliance cost per year	\$1,497	\$52,413	\$32	\$24,000,000	\$1,497	\$22,462
Start-up time	11 hr	11 hr	1 hr	1 hr	11 hr	11 hr
Ongoing compliance time per year	1 hr	1 hr	1 hr	1 hr	1 hr	1 hr

Offset option

No offset required as maintaining status quo.

Option 2 – Deregulation

Positive Impacts

- Less administrative burden.
- Drone safety rules would still provide some mitigation of noise impacts from drones and eVTOLs.

Negative Impacts

- No recourse for Commonwealth Government to manage noise impacts.
- Onus for noise regulation of drones and eVTOL becomes a state/territory government responsibility and may result in inconsistency across jurisdictions.
- Removes rules which enable operator accountability.
- Potential to flood the market with new operators.
- Irresponsible operators could tarnish the industry.
- Increased community concern (complaints would likely increase from the 30 complaints received by the NCIS in 2020).
- Lack of certainty among international investors due to absence of regulatory framework.
- Poor regulatory environment may stifle anticipated industry growth (anticipated growth of \$14.5 billion in GDP over the next 20 years and an additional 5,500 jobs).

Stakeholder Impacts

This option **removes all** direct regulatory impacts such as the burden of compliance. However, it has other significant flow-on impacts, for example, on the economy (reduction in projected industry growth), competition (may prevent new entrants to the market), and society (may prohibit new beneficial drone applications). It also provides no incentive for operators or developers to reduce noise from drones and eVTOLs and provides no regulatory capacity to address the noise impacts on communities.

This option is the least administratively burdensome for all operators across the industry but could create other, arguably bigger problems, in the sector (such as lack of stability and reduced certainty among international investors).

This options increases or changes the need for market intervention.

Requirements:

- Nil

Table 2: Total regulatory impact of Option 2

Option name	Deregulation of the drone and eVTOL industry
Option description	Remove all requirements for drone and eVTOL operators.
Businesses affected	35 small, medium and large businesses (estimate based on current numbers and expected growth)
Individuals affected	All drone operators except in QLD and VIC (approximately 750,000).
Community organisations affected	15 (estimate based on current numbers and expected growth)

	Cost per business	Total cost for all businesses	Cost per individual	Total cost for individuals	Cost per community organisation	Total cost for all community organisations
Start-up cost	\$0	\$0	\$0	\$0	\$0	\$0
Ongoing compliance cost per year	\$0	\$0	\$0	\$0	\$0	\$0
Start-up time	0 hr	0 hr	0 hr	0 hr	0 hr	0 hr
Ongoing compliance time per year	0 hr	0 hr	0 hr	0 hr	0 hr	0 hr

Offset option

No offsets are required as this option decreases regulatory burden.

Option 3 – Flexible reform

Positive Impacts

This option provides highest net benefit as it delivers certainty, provides more data about drone and eVTOL users and reduces non-compliance. Option 3 allows for effective noise compliance and management that minimises the regulatory burden for the majority of operators and only imposes requirements on operators likely to have a significant noise impact. This flexible approach encourages operators to innovate to reduce noise impacts and aims to reduce regulatory burden.

- Provides clarity for operators and the general public.
- Results in fit-for-purpose regulations that provide flexibility for operators.
- Provides an incentive for quieter operations.
- Enables a higher rate of compliance.
- Comprehensive framework would help realise potential economic benefits stemming from the sector (anticipated growth of \$14.5 billion in gross domestic product (GDP) over the next 20 years and an additional 5,500 jobs).

Negative Impacts

- Different processes for different operating environments.

Stakeholder Impacts

This option **removes most** direct regulatory impacts. This option will predominately impact medium to large commercial operators. This option changes the administrative requirements depending on differing operations and operating environments.

Requirements:

- Approval process for a **small number** of drone and eVTOL operators – annually.
- Delay costs – annually for businesses and community organisations.
- Noise testing – assumed for businesses and community organisations as a start-up cost but would need to be tested again if significant modifications were made to an aircraft.
- Reporting – monthly for businesses and community organisations.

Table 3: Total regulatory impact of Option 3

Option name	Reform the Regulations
Option description	Flexible and fit-for-purpose drone and eVTOL regulations
Businesses affected	5 large businesses (estimate of current numbers and expected growth and assuming only large operators will need to fulfil the full application process)
Individuals affected	0 (assuming most individuals will be exempt)
Community organisations affected	1 (estimate assuming only large operators will need to complete the full application process)

	Cost per business	Total cost for all businesses	Cost per individual	Total cost for individuals	Cost per community organisation	Total cost for all community organisations
Start-up cost	\$7,342	\$36,708	\$0	\$0	\$7,342	\$7,342
Ongoing compliance cost per year	\$1,497	\$7,487	\$0	\$0	\$1,497	\$1,497
Start-up time	11 hr	11 hr	0 hr	0 hr	11 hr	11 hr
Ongoing compliance time per year	1 hr	1 hr	0 hr	0 hr	1 hr	1 hr

Offset option

No offsets are required as this option decreases regulatory burden.

Option 4 – Classification standards

Positive Impacts

- Will likely achieve higher level of compliance.

Negative Impacts

- Implementation delay due to significant amount of time required to develop the tool.
- Additional administrative application/re-application process and retesting process required following significant modifications which may disincentivise the development of quieter or lighter aircraft.
- The classification system does not necessarily reflect the noise profile of different drones or eVTOL systems.
- No incentives to decrease noise if weight stays the same.
- Does not take into account cumulative noise.

Stakeholder Impacts

This option **increases** direct regulatory impacts. This option will affect medium and large commercial operators and increases/changes administrative requirements.

Requirements:

- Approval process for a **small number** of drone and eVTOL operators (assuming most operators would not require an approval) – annually.
- Delay costs – annually for businesses and community organisations.
- Noise testing – assumed for businesses and community organisations as a start-up cost but would need to be redone if significant modifications were done to an aircraft.
- Reporting – monthly for businesses and community organisations

Table 4: Total regulatory impact of Option 4

Option name	Classification standards
Option description	Establish a benchmarking tool for all drones and eVTOL aircraft
Businesses affected	25 medium and large businesses (estimate based on current numbers and expected growth)
Individuals affected	0 (assuming most individuals will be exempt)
Community organisations affected	5 (estimate assuming only medium and large operators will need to fulfil the process)

	Cost per business	Total cost for all business	Cost per individual	Total cost for individuals	Cost per community organisation	Total cost for all community organisation
Start-up cost	\$4,420	\$110,488	\$0	\$0	\$7,342	\$36,708
Ongoing compliance cost per year	\$1,497	\$37,438	\$0	\$0	\$1,497	\$7,487
Start-up time	11 hr	11 hr	0 hr	0 hr	11 hr	11 hr
Ongoing compliance time per year	1 hr	1 hr	0 hr	0 hr	1 hr	1 hr

Offset option

No offsets are required as this option decreases regulatory burden.

PREFERRED OPTION

The objective of any policy response by the Australian Government is to define and establish a drone and eVTOL regulatory framework that reflects the fundamental changes in the emerging industry, and enables and encourages industry growth and innovation.

Option 3 would ensure an approach to noise regulation that is sustainable for operators, facilitates innovation in the industry, balances community expectations and enables growth in the industry.

Option 3 would remove outdated requirements around the need for noise certification and exemption. It would provide certainty to operators around their obligations and include requirements that are achievable and appropriate for the unique operating environment of drones and eVTOL aircraft. This would ultimately lead to higher rates of compliance. This option would incentivise innovation and the development of quieter drones and would not have any undue effects on competition. To this end, it would likely help realise the forecasted industry growth and the flow on benefits for the economy.

If adopted, **Option 3** would remain in place until a longer-term approach to noise regulation is developed as part of the NEAT policy. The Department will lead the development of a long-term outcomes based noise framework for emerging technologies utilising UTM systems in consultation with state, territory and local governments. This process will include consistent processes, modelling noise impacts at ground level, regulation based on noise impacts at ground level and a defined agreed standards for noise thresholds. Noise impacts associated with take-off and landing sites will also be considered as part of the infrastructure planning framework.

APPENDIX 1: REGULATORY BURDEN ESTIMATE (RBE) TABLE

Average annual regulatory costs (from business as usual) Change in costs (\$ millions)

	Business	Individuals	Community Organisations	Totals	Total change in costs
Option 1 Total, by sector	\$0.257M	\$24.000M	\$0.101M	\$24.367M	\$0.000M
Option 2 Total, by sector	\$0.000M	\$0.000M	\$0.000M	\$0.000M	-\$24.367M
Option 3 Total, by sector	\$0.037M	\$0.000M	\$0.007M	\$0.044M	-\$24.323M
Option 4 Total, by sector	\$0.110M	\$0.000M	\$0.037M	\$0.147M	-\$24.220M

Note: Negative dollar figures present a cost saving.

An assessment of compliance costs in itself do not provide an answer to the most effective and efficient regulatory proposal. Rather, it provides information that needs to be considered alongside other factors when deciding between policy options.