



**LEGISLATIVE ASSEMBLY**  
FOR THE AUSTRALIAN CAPITAL TERRITORY

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STANDING COMMITTEE ON ECONOMIC DEVELOPMENT AND TOURISM  
Mr Jeremy Hanson MLA (Chair), Ms Suzanne Orr MLA (Deputy Chair),  
Mr Michael Petterson MLA

## Submission Cover Sheet

**Inquiry into drone delivery systems in the ACT**

**Submission Number: 074**

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**Dr Murray May – submission to the ACT Legislative Assembly Standing Committee on Economic Development and Tourism: Inquiry into drone delivery systems in the ACT**

20 February 2019

Dear Committee Members

I have structured my submission using the following main headings as these intentionally cut across the terms of reference in order to provide another perspective for the committee to consider.

1. The standing committee's frame of reference
2. Two scenarios
3. Invasive noise
4. Quality of life, well-being, and public health
5. Project Wing's marketing and unpacking the drone debate
6. Conclusion

There is also a reference list at the end.

I have also forwarded two separate attachment documents with my submission for the committee's consideration, namely:

1. Institute for Technology Assessment of the Austrian Academy for Sciences (2018). Delivery drones from a technology assessment perspective. While not necessarily agreeing with all of it, nevertheless this document provides a useful overview of the many still to be answered questions on drones and their place in societies.
2. Public Health Association of Australia (2017). Policy-at-a-glance - environmental noise policy. I have included this as a short useful summary, as some ACT politicians appear to be unfamiliar with the public health aspects of environmental noise.

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**1. The standing committee's frame of reference**

I note from the ACT Legislative Assembly website that the Standing Committee's role is defined as follows:

*A Standing Committee on Economic Development and Tourism to examine matters relating to economic and business development, small business, tourism, [market and regulatory reform, public sector management, taxation and revenue], procurement, regional development, international trade, skills development and employment creation, and technology, arts and culture.*

*On 26 October 2017 the Legislative Assembly resolved to amend:*

*Omit the words "market and regulatory reform, public sector management, taxation and revenue", substitute "Access Canberra".*

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The committee's frame of reference by definition is biased towards economic issues and could well mean that a limited lens is used to examine this issue, rather than a holistic approach. Implicit in the term of reference (b) "the economic impact of drone delivery being tested in the ACT" is that introduction of drone delivery systems in the ACT will inevitably be desirable. This bias is also apparent in the assumption of the inquiry term of reference (e) "ways to improve the use of drone delivery technology within the ACT". One hopes "improve" here includes limiting the scope of drone delivery technology in the ACT, rather than just assuming that drone delivery systems are a foregone conclusion. For example, a recent email from Mick Gentleman states that [Project Wing] "have been trialling their new business model in the ACT over the last two years, and the ACT government welcomes this business investment in Canberra". It's true that term of reference (d) addresses "the extent of any environmental impact", though if the committee were a standing one on "quality of life and community health", its overriding concerns and priorities would be quite different..

## **2. Two scenarios**

**Attached** for the committee's consideration is a 2018 report "**Delivery drones from a technology assessment perspective**" by the Institute for Technology Assessment (ITA) of the Austrian Academy of Sciences" (Institute for Technology Assessment of the Austrian Academy for Sciences, 2018). Of particular value is the report's consideration (p.37) of two scenarios for drone deployment:

The **basic scenario no. 1 (the so-called "pizza scenario")** is the widespread delivery of all kinds of small goods (parcels) by drones, instead of (or in combination with) delivery vans and trucks. The AlphaBeta consultancy for Project Wing estimated that by 2030 there would be 5.6 million drone deliveries a year or 11,000 drone deliveries a day (Evans, 2018).

The **alternative scenario no. 2 (the so-called "emergency scenario")** is less extensive: the delivery service by drones would only be a niche market, in which special goods, e.g. in the medical field, would be routinely transported between hospitals, pharmacies, and practitioners, or for other emergency purposes. Another potential niche market could be the regular supply of goods to remote areas, where no roads lead or there is no other connection.

Most of the impacts are much aggravated in the case of scenario no. 1 as it is associated with ubiquitous and massive drone flights, whereas in scenario no. 2 flights take place less frequently, perhaps only occasionally. Those with significant concerns about scenario 1 usually support the wide range of other less invasive uses for drones in scenario 2 such as for mapping and surveying, emergencies, insurance industry use after floods, environmental protection, inspection of power lines in Canberra by Evoenergy and so on. For example, Canberra MP Gai Brodtmann readily recognises the benefits of drones in rural and remote

Australia, in contrast with the widespread concern by residents in her electorate about the delivery trial in Bonython (Jervis-Bardy, 2018e).

More often than not, proponents of expanded drone delivery such as the ACT government and Project Wing mix up the two scenarios rather than recognising the many pitfalls from a community point of view of scenario 1. In scenario 1, considerable numbers of drones filling the lower airspace bring the noise pollution normally associated with heavily trafficked roads or worse, or with living near airports, with likely negative impacts on real estate values in those areas. The aesthetic appearance of drones swarming the lower airspace can also be expected to be met with resistance from the population.

Flowing from the above is the conclusion that just because we can do something it doesn't necessarily mean we should. As an editorial in the Canberra Times put it: "what if the residents of Gungahlin decide ... they'd rather not deal with the noise and lack of privacy that Bonython residents have complained of? What if it's decided that Canberra, as an already liveable and progressive city, has no real need for drones to deliver things at all?" (Editorial, 2018b)

There are a **host of open questions** regarding the commercial use of drones covering technical, legislative, societal aspects, safety and environmental risks. The trial in Bonython demonstrates that it was approved and implemented in the absence of sufficient foresight being given to these issues. For example, there is no agency responsible for the very significant noise issue arising from commercial drone use. The Civil Aviation Safety Authority (CASA) states that both noise and privacy are not its remit, as it is only the safety regulator. Airservices Australia has a role in managing aircraft noise in Australia, but states there are no federal noise regulations applying to drones. The ACT Environment Protection Authority (EPA) has a role in managing community noise e.g. air conditioner noise from a neighbour, but has no role in relation to noise from drones. This is completely unsatisfactory. The ACT government claims that "Wing would need to meet all the necessary legal and regulatory requirements of the territory and/or Commonwealth" (Jervis-Bardy, 2018b) but forgets to mention that governance arrangements for drones are deficient or absent altogether.

### **3. Invasive noise**

Invasive noise is top of the list of concerns for residents of Bonython which has been subject to the delivery drone "trial" in recent months. The noise level has been recorded at the 80 dB level, which is well above the community noise standards applicable in Canberra. In residential areas, the standards are 45 dB(A) during the day and 35 dB(A) overnight. This applies for example to air conditioner noise from a neighbouring property. In the ACT government flyer on these standards, the daytime levels in a quiet residential suburb are listed as being typically 35-45 dB(A) whereas a lawn mower 15 metres away is listed as 70 dB(A) (ACT Government, 2015).

Some activities such as garden maintenance and regarded as acceptable to the community make noise above the permitted standards in prescribed timeframes. However, the tenor of the document is on noise reduction wherever possible. With excessive noise, people are

encouraged to discuss the issue with the person causing the noise or alternatively initiating mediation via the Conflict Resolution Service. When purchasing and installing reverse cycle air conditioners, heat pumps, pool pumps etc. people are advised to consider the location in relation to neighbours. Such advice makes sense, given that almost 80 per cent of all complaints made to the ACT Environment Protection Authority in 2017-18 are about excessive noise (Brown, 2018).

Although a comparison of drone noise with lawn mowers has been made by Chief Minister Andrew Barr, such an analogy is flawed and shows a lack of understanding of the ACT government's own advice on noise in residential areas. The trial in Bonython was approved by CASA for the following timeframes:

- Monday to Saturday from 7 am to 8 pm
- Sunday from 8 am to 8 pm.

Is Andrew Barr suggesting it is acceptable to have 20 to 40 overflights of drones each and every day of the week, at sound levels equivalent to or greater than a lawn mower? It should be remembered that the decibel scale is a logarithmic one, meaning that every 10 dB increase is a doubling of perceived loudness. Further, loudness is only part of the problem, with the high pitched frequency of drone noise producing annoyance responses greater than those associated with regular road vehicles. A NASA study on this issue concluded that this result "casts doubt on the idea that [drone] operators can expect their operations to be greeted with minimal noise-based opposition as long as the sound of their systems are 'no louder than' conventional package delivery solutions" (Christian & Cabell, 2017). With scenario 1 discussed above, is Andrew Barr then suggesting it is acceptable to have the equivalent of multiple high pitched lawn mowers overflying suburbs each day of the week, affecting many people and not just a few neighbours as is the case with a mower, the latter perhaps once a fortnight? The additive effects of multiple drones only increase noise levels still further.

The threats posed to wildlife and birds in particular are discussed in the ITA document attached (Institute for Technology Assessment of the Austrian Academy for Sciences, 2018, p. p. 38). Noise and the frequent presence of drones can be a stress for them, and this has been borne out in Bonython by the "on the ground" observations of missing birdlife and dogs barking constantly, the latter acting as a further noise irritant in the suburb. Residents from other suburbs have expressed concerns about the disturbance of birds and impacts on patterns of feeding, nesting and breeding and argue that they should not be disturbed or driven away by unnecessary technological intrusion for narrow commercial advantage (Blount, 2018). Urgent action has been called for on the loss of 3,000 trees a year in Canberra, with the Canberra Ornithologists Group informing another ACT assembly inquiry on nature in the city that the loss of large numbers of trees is leading to a decline in endangered and common bird species (Burgess, 2019b). The massive drone invasion scenario 1 would certainly exacerbate the threat to birdlife in Canberra generally.

Given the above, it is little surprise that 80 per cent of hundreds of Bonython residents canvassed about Project Wing's trial in the suburb were not in favour of commercial drone use in residential areas (McIntyre, 2018). As is often the case with developers such as

Project Wing, they have attempted to portray objections to their commercial plans as coming from just a small group of residents. In contrast, the reality is that Bonython residents in late 2018 delivered a petition with more than 1,000 signatures to the ACT Legislative Assembly, calling for a block on future household drone delivery services in the capital, including Wing's planned operation in Canberra's northern suburbs (Jervis-Bardy, 2018a). As at 18 February 2019, the Bonython against Drones Facebook group has 228 members.

Other sources of community feedback summarised by Gai Brodtmann MP, Member for Canberra (Brodtmann, 2019) include:

- In December 2018, the Canberra Times published a poll canvassing a broader range of people than Bonython residents. The result was 68 per cent against drones, 17 per cent for and 15 percent unsure.
- The RiotAct's online poll on the delivery drone services showed 66 per cent of respondents saying "Keep them out of my backyard".
- ABC Radio's poll on 13 February 2019 with 793 participants found 65 per cent were against the drone delivery trial, or the service in general.

#### **4. Quality of life, well-being, and public health**

There is a very large literature on quality of life and well-being which challenges that notion that all that matters in life is economic growth and material well-being, including popular books such as Clive Hamilton's *Growth Fetish* (Hamilton, 2003) This has even been expressed of late in the ACT government's intention to introduce a well-being index – this seeks to go beyond economic and population data to measure progress via such an index (Burgess, 2019a). It also expressed through the idea of "liveability" of a city.

ANU human ecologist Emeritus Professor Stephen Boyden AM has long considered such issues and encourages planning for biosensitive cities that address human health needs and also the health needs of ecosystems (Boyden, 2010, p. 45). Quality of life or lack of it is strongly associated with mental health issues and stress related challenges, with mental health compromised in response to unsatisfactory physical and psychosocial conditions. Boyden addresses a range of physical and psychosocial factors that are important for human health. The physical ones include, for example, clean air, clean water, healthy (natural) diet, protection from extremes of weather, and *noise levels within the natural range*. The psychosocial factors include, for example, emotional support networks, recreational activities, sense of purpose and belonging, sense of security etc.

With respect to noise and legal requirements, the residential tenancy legislation of every state and territory enshrines the right of tenants to quiet enjoyment. In most jurisdictions, the legislation expands the right to quiet enjoyment so it also includes the right to reasonable peace, comfort and privacy (Victorian Law Reform Commission). These rights are akin to the basic health needs considered above in human ecology terms.

Contrast the above with an opinion piece on the invasion of all manner of noisy technology into public spaces. The author states that the more time she spends outdoors, the more it feels like she is being besieged by noise intrusion in ways that were previously unimaginable. She continues: “Since when was it socially acceptable to blast out nightclub anthems at the beach? Or fly a noisy drone with its incessant, high-pitched buzzing through the tranquil canopy of a national park? Just because you got state-of-the-art Bluetooth speakers for Christmas doesn’t mean you have a free pass to play music at full bore” (Stark, 2019).

Noise pollution is already recognised by health authorities as of considerable public health significance, with a World Health Organization publication *Burden of disease from environmental noise: quantification of health life years lost in Europe* drawing together much relevant information (World Health Organization, 2011). While Project Wing uses consultancy firms such as AlphaBeta to argue for large economic benefits for ACT businesses (Jervis-Bardy, 2018c), the economic framework used is very narrow and commercially focused, and ignores the considerable adverse health effects and costs outlined in the WHO report for example.

As a short summary of the above issues, I **attach** to my submission a 2017 policy overview on environmental noise from the Public Health Association of Australia (Public Health Association of Australia, 2017). Particularly salient points include:

- Environmental noise is public health issue that requires serious attention.
- Common noise sources vary in sound level, and sound can also be characterised by frequency (pitch).
- The repetitive nature of a particular noise and/or the inability of an individual to control it can cause annoyance and stress.
- Environmental noise pollution relates to ambient sound beyond comfort levels. When background levels are low as in a suburb such as Bonython, the experienced noise pollution is more prominent.
- Vulnerable groups such as children, older persons, people with mental health issues, people who are unwell may be affected in more marked ways.
- Long-term environmental noise exposure can affect stress levels, and increase the risk of hypertension and elevate risks of heart attacks.
- Categorising noise with respect to sound level, pitch, how often etc, is important in assessing impact.
- Action to ensure a safe and healthy environment is a critical public health priority.
- Authorities need to make use of “strategic noise maps” and undertake strategic noise impact assessment.
- Governments need to develop policies and strategies to promote public health and reduce adverse environmental consequences from environmental noise pollution.

My own background work and experience on aircraft noise issues suggests that experts in the field of psychoacoustics should be drawn on to a much greater extent in order to better understand the impacts of noise on health.

The Bonython against Drones community group on its website (<https://bonythonagainstdrones.com/about-us/>) states that “the peaceful amenity of our homes is the foundation of our lives, and paramount to our health and wellbeing”. As reflected in many letters and comments to the Canberra Times, RiotACT etc. and the many representations to local politicians such as Gai Brodtmann MP Member for Canberra, this peaceful amenity has been seriously disturbed by the Project Wing drone trial in Bonython. The public health literature on the impacts of environmental noise underlines the significance of the negative impacts observed in Bonython.

## **5. Project Wing’s marketing and unpacking the drone debate**

Project Wing’s marketing has repeatedly promoted particular themes suggesting that the adoption of commercial drone delivery is “forward thinking” and “progressive”. Thus Wing chief executive James Ryan Burgess states that “We decided to invest in Canberra because it’s a growing innovative city and Canberrans have a reputation as early adopters of new technology” (Editorial, 2018b). The economic benefits are described in “gold rush” terms, with the AlphaBeta consultancy report claiming that “projections rely on the premise that deliveries by air are more time and cost effective than deliveries by road, making customers more likely to indulge in ‘additional or higher-value purchases’ “ (Jervis-Bardy, 2018c). Naturally drone technology is promoted as being “environmentally friendly” by reducing greenhouse gas emissions. A more critical review suggests that much of this is marketing hype to support the company’s commercial objectives.

The introduction of new technology often has many unforeseen consequences. For example, while smartphones are now ubiquitous, distraction from smartphone use while driving is now common and a significant factor in road traffic crashes, resulting in deaths and serious injuries.

With respect to consumer behaviour, drone delivery has the potential via its quick delivery aspect to create an induced consumer need with a new environment based on the promise of fulfilment of wishes and instant gratification in a very short time. This could easily fuel binge buying and increase levels of consumer indebtedness. Further increasing the online shopping trend could change the landscape of shopping outlets considerably with many non-virtual shops going out of business (Institute for Technology Assessment of the Austrian Academy for Sciences, 2018, p. 42).

The transport and logistic sector is personnel-intensive, and the labour market for drivers of delivery vehicles would very likely be under threat in an expanded drone delivery scenario. This group of relatively lowly skilled workers could easily be a casualty of commercial drone delivery (Institute for Technology Assessment of the Austrian Academy for Sciences, 2018, p. 39).

In respect to energy consumption and greenhouse gas emissions, drones need electricity and although each individual flight would not consume much, the overall picture of a generalised drone delivery system may be different, in particular if compared with current deliveries with vehicles carrying many parcels at once. Recent research concludes that for parcels up to 0.5 kg the energy balance is in favour of drones. Heavier packages were found

to be best suited for efficient, often electric, ground delivery vehicles (Samaras & Stolaroff, 2018). The overall assessment may be different if the whole infrastructure is put in perspective. Overall, a life-cycle assessment is warranted, including among other factors the life cycle of the batteries needed (Institute for Technology Assessment of the Austrian Academy for Sciences, 2018, p. 38). Moreover, the environmental lens in the Samaras & Stolaroff research is constrained, in that the impacts of delivery drones on wildlife including birds are not considered, nor the impacts of environmental noise on people, other than the throwaway line at the end of their piece: “Now we just have to do something about the noise of all those propellers overhead”. This is always a disadvantage of studies that are not holistic, with the recommendations arising limited by the narrow evaluation framework used.

Project Wing responds to the community angst about noise in various ways. On the one hand it suggests that “it is a new sound that may at first be unfamiliar to people” (Editorial, 2018a), and on the other it says “the company is developing a quieter, ‘more pleasant’ aircraft model ahead of its Mitchell launch” (Jervis-Bardy, 2018d). Just because a sound is new is not a reason that people should have to adapt to it. And as with improvements in aircraft noise, there are limits on improvements to drone noise as the airflow around many rotors cannot be avoided.

Comparative work on the greenhouse advantages of ground based electric vehicles needs to be considered. Australia Post estimates the volume of parcels has grown 10 per cent per year for the past three years and is rolling out new electronic delivery vehicles (eDVs) with more sun protection and carrying capacity (Burt & Mackay, 2019). Along with the new e-trikes, Australia Post has also ordered a new fleet of 4,000 electric pushbikes. Both electric vehicles will be much quieter than the traditional postie motorbikes. There are health and safety advantages for the posties and also the community being delivered to.

Though I have not addressed the issue of regulation much, there are clearly many unaddressed issues. In a dense population area, collisions of drones with people are possible and injuries are quite likely. Though the Civil Aviation Safety Authority created an exemption to its usual distance requirements to allow drone deliveries in Bonython, there still remain concerns about safety. What happens if a recreational drone collides with a commercial drone for example, bring the commercial drone down on a person? CASA’s highest priority is no doubt collision with an aircraft, but misuse of recreational drones has received prominence of late including the grounding of firefighting aircraft.

## **6. Conclusion**

The Bonython delivery drone trial was completely at odds with the normally accepted standards for community noise, and even with what is normally accepted as outside those standards such as use of lawn mowers which don’t continue week after week every day. Such a trial was truly a “trial”, riding roughshod over community rights to the quiet enjoyment of one’s home, and I am surprised it was ever approved. Countenancing exposure of further suburbs in Gungahlin to this onslaught is even more surprising given the strength of feedback from the Bonython community, not to mention the negative feedback from the broader Canberra community.

The approach largely taken by the ACT Government and Chief Minister to date shows little understanding, if any, of the important public health implications of environmental noise (as outlined above) or of fields such as soundscape ecology (Pijanowski, Farina, Gage, Dumyahn, & Krause, 2011). This is the study of sound in landscapes in order to understand how sound from various sources can be used to understand coupled natural-human dynamics. Soundscapes provide ecosystem services to humans in the form of many life-fulfilling functions. Many soundscapes also have cultural, historical, recreational, aesthetic, and therapeutic values. Unique and natural soundscapes can be subtle or powerful links for humans to their environment. In light of the multitude of threats, unique and natural soundscapes have been referred to as an endangered resource. This has been shown in no small way by the strong reaction from many residents of Bonython.

Many, including a good few people in Bonython, are open to the selective use of drones for environmental and monitoring purposes as outlined in scenario 2 above, the so-called “emergency scenario”. Evoenergy’s use of small drones for yearly monitoring of power lines is a good example.

The widespread delivery scenario 1, the so-called “pizza scenario” is another matter altogether, and should be avoided in my view because of its broad environmental impacts on humans and wildlife. People in Canberra appreciate the city’s quality of life and don’t want it further degraded. A permanent installation of a scenario 1 scheme would only depress real estate values in the exposed suburbs. Australia Post’s model of quiet delivery e-trikes and electric bicycles ticks the right boxes. The birds will be around, the greenhouse emission argument holds, and the peaceful amenity of people’s homes and suburbs is preserved.

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