

Submission 88 – UWA Minderoo Tech & Policy Lab



SUBMISSION TO THE DEPARTMENT OF INFRASTRUCTURE, TRANSPORT, REGIONAL DEVELOPMENT, COMMUNICATIONS AND THE ARTS

RESPONSE TO THE INFRASTRUCTURE PLANNING GUIDELINES FOR DRONE DELIVERY SERVICES

This submission responds to the *Infrastructure Planning Guidelines for Drone Delivery Services – Public Consultation Draft* (Draft Guidelines), published by the Commonwealth Department of Infrastructure, Transport, Regional Development, Communications and the Arts for public consultation in November 2022.¹ The Draft Guidelines are the first publicly-available component of the Department’s *Infrastructure Planning Framework*, which commenced development in September 2021 (in consultation with stakeholders from the drone industry and state and territory governments), and is proposed to be finalised in the fourth financial quarter of 2023.

The Draft Guidelines demonstrate the limitations of policy guidance developed without public input and informed by a narrow set of industry and government voices.² Overall, the objective of the Draft Guidelines is to enable drone delivery services through the streamlining of local planning policies and processes. Remarkably, the Guidelines entirely overlook what ought to be primary concerns of local planning authorities – namely, the need for broad public consultation;³ for localised, evidence-informed assessment of costs and benefits; and for free, prior, and informed consent at the community-level – as necessary pre-conditions *before* delivery drones become a feature of our skies and lives.

Effective consultation within local communities should assess risks as well as opportunities arising from delivery drones, especially regarding the impacts of drones on birds, wildlife, and the environment;⁴ on noise, visual pollution, and public amenity; and on public health.⁵ This submission seeks to address these gaps, informed by our multi-year research program on drone delivery services, as well as our international experience researching the practices of Google⁶ – one of the prime movers behind the Draft Guidelines, through its affiliate Wing Aviation.

¹ [‘Infrastructure planning guidelines for drone delivery services’](#) (consultation 04 November 2022 – 02 December 2022).

² Out of 60 submissions made to the Department’s public consultation on the 2020 [‘Issues Paper on National Emerging Aviation Technologies’](#), only one submission was made by a local residents’ group. The majority of submissions were made by companies, consultancies, and confidential stakeholders. This information has been collated based on the publicly-available index of submissions on the Department’s website. See [‘Submissions received on the National Aviation Policy Issues Paper on Emerging Aviation Technologies’](#).

³ Tuggeranong Community Council made the following recommendation in their submission to the [Inquiry into Drone Delivery Systems in the ACT](#): “All people in the affected suburbs must be adequately consulted.” (20 February 2019).

⁴ For example, see P Elford, [‘Submission on the Inquiry into the Drone Delivery System in the ACT’](#) (27 February 2019); also Environmental Defenders’ Office (ACT), [‘Inquiry into drone delivery systems in the ACT: Environmental Defenders Office ACT Submission’](#) (25 February 2019).

⁵ See I McIntyre, [‘Inquiry into drone delivery system in the ACT’](#) (06 March 2019); also Anonymous, submission by an 11-year-old resident who describes noise from delivery drones as “loud screaming ghosts when they fly over you...They disturb me when I play outside”, see [‘Inquiry into Drone Delivery Systems in the ACT’](#) (27 February 2019). See also L Fitzgerald, [‘Inquiry into Drone Delivery Systems in the ACT’](#) (22 February 2019).

⁶ See E P Goodman & J Powles, [‘Urbanism Under Google: Lessons from Sidewalk Toronto’](#) (2019); J Powles & H Hodson, [‘Google DeepMind and Healthcare in an Age of Algorithms’](#) (2017); J Powles, [‘The Case that Won’t be Forgotten’](#) (2015).

ABOUT US – UWA MINDEROO TECH & POLICY LAB

This submission has been developed by the UWA Munderoo Tech & Policy Lab, an independent, interdisciplinary research institute based at The University of Western Australia Law School. The Lab has expertise in technology law and governance, biomechanics and bioengineering, data analytics and machine learning, and augmented/virtual/extended reality technologies.

This submission was spearheaded by drone research program team members, Dr Nardine Alnemr, Anna Zenz, and Dr Hannah Smith, under the leadership of Lab Directors Associate Professor Julia Powles and Professor Jacqueline Alderson.

The Lab is part of a global research network aimed at developing an accountable, pro-public tech ecosystem. The Lab is supported by diverse funding, including a gift from Australian charity Munderoo Foundation. We maintain the highest standards of academic integrity and are committed to the autonomy and independence of our researchers to pursue work free of external influence.

RECOMMENDATIONS

In this submission we make five recommendations. We also provide an Appendix that presents relevant comparative experience from the introduction of a parallel emerging technology – electronic scooters – into communities with insufficient attention to planning considerations.

1. **Assist planning authorities to differentiate infrequent, necessary drone deliveries (e.g., in medical and emergency contexts), from constant, convenience-based drone deliveries (e.g., coffee and fast food). This will enable the prioritisation and development of planning processes and policies that are appropriate and commensurate to the impacts of drones – as well as important conversations about whether drones are permissible at all.**

The Draft Guidelines are addressed to “the use of drones to deliver on-demand supplies (such as food, drinks, medical supplies or small packages) to customers from a local base station”. The phrasing “on-demand supplies” conflates deliveries that vary dramatically in their societal benefit vs risk calculus, and therefore in the degree to which they automatically deserve facilitation by planning authorities.

We recommend that the Draft Guidelines assist planning authorities by differentiating infrequent, necessary drone deliveries (e.g., in medical and emergency contexts), from constant, convenience-based drone deliveries (e.g., coffee and fast food). The rationale for this is that drone deliveries have tremendous material implications for the daily life of people and communities – introducing new obstructions into the sky;⁷ increased noise, visual pollution, and reductions in public amenity;⁸ and significant public health impacts – as well as lasting impacts on birds, wildlife, and every aspect of our physical and natural environment through the vital living habitat of the skies. These impacts are discussed further below. Differentiating drone use-cases of *necessity* from those of *convenience* will enable the prioritisation and development of planning processes and policies that are appropriate and commensurate to the impacts of drones at different scales.

⁷ S Applin, ‘[Deliveries by Drone: Obstacles and Sociability](#)’ (2016).

⁸ See J Reynolds (NODRONE.ZONE), ‘[Inquiry into Drone Delivery Systems in the ACT](#)’ (22 February 2019).

2. Avoid inappropriate generalisations from narrow existing experience – particularly that of Australia’s principal delivery drone operator, Google Wing.

The current experience of operators of drone delivery services is far too narrow to inform national guidelines, yet the Draft Guidelines encourage existing operators to guide local authorities through “shar[ing] previous experience with how other local governments have overseen [drone delivery] operations, provided [development approval] or related land use permissions, or coordinated with the department in relation to community feedback and noise permissions”.⁹

As of November 2022, there are only two approved drone delivery services in Australia – Wing Aviation Pty Ltd (a subsidiary of Google’s holding company, Alphabet Inc., referred to as ‘Google Wing’ for convenience) and Swoop Aero Pty Ltd.¹⁰ Their respective operations cover very constrained areas. Google Wing operates in select suburbs in North Canberra and Tuggeranong (ACT), along with Logan (QLD). Severely limiting the generalisability of Google Wing’s experience, its trials and associated marketing and government relations efforts are entirely subsidised by Google’s business internationally, with zero cost to either merchants or consumers – a luxury unavailable to any Australian operator. Swoop Aero’s trials are in a regional area up to 60 km around Goondiwindi (QLD). While Swoop Aero’s operations are profitable, the company receives generous government funding to support its operations. There are severe limitations in extrapolating either company’s experience, even before considering the ways in which communities across Australia would require varied planning priorities based on population density and demographics, accessibility, and shared space with birds and wildlife.

Given documented deficiencies in addressing the impact of delivery drone operations on residents in existing Wing trials, as presented in submissions to the 2019 ACT Inquiry into drone delivery systems,¹¹ as well as responses to the 2020 Issues Paper on National Emerging Aviation Technologies,¹² there are further warning signals about extending Wing’s existing experience to support a broader national approach. Drone delivery trials have transformed daily life for residents, with those in the ACT reporting that their dogs became distressed when drones flew over dog parks; that while driving, walking, and cycling, distractions by drone flights and noise affected residents’ sense of public safety; and that residents’ inability to enjoy the solace of their suburbs and homes took a toll on their health and wellbeing.¹³ Amenities such as electricity have also been impacted by emergency drone landings of Wing drones, causing power outages.¹⁴ All of these impacts should give pause to planning authorities. Drone delivery services are not only about on-demand, point A to point B pick-up and drop-offs – they are also about the societal and collective impact that drones have on public and private spaces alike.¹⁵

⁹ See p.12 of the Infrastructure Planning Guidelines for Drone Delivery Services, Attachment B, ‘Land use planning’.

¹⁰ See Civil Aviation Safety Authority, ‘[Drone delivery services](#)’ (13 July 2022).

¹¹ Standing Committee on Economic Development and Tourism, ‘. (Report 6, July 2019), page 5-6.

¹² See Minderoo Tech & Policy Lab, ‘[Submission to National Aviation policy Issues Paper on Emerging Aviation Technologies](#)’ (31 October 2020); also Whittlesea et al., ‘[The sky’s limit for the electric age of aviation](#)’ (31 October 2020); The Hon Ben Carroll MP, ‘[Victorian Government Submission to the Emerging Aviation Technologies: National Aviation Policy Issues Paper](#)’ (01 February 2021).

¹³ See Tuggeranong Community Council, ‘[Submission on the Inquiry into Drone Delivery System in the ACT](#)’ (20 February 2019), Standing Committee on Economic Development and Tourism, ‘[Inquiry into drone delivery systems in the ACT](#)’ (Report 6, July 2019). For academic research on noise and wellbeing, see S Pink et al., ‘[Recycling traffic noise: transforming sonic mobilities for revalue and wellbeing](#)’ (2019). See also L C Corrigan, ‘[Voice of Real Australia: Wing drone delivery service backlash in Canberra](#)’ (The Canberra Times, 30 June 2022).

¹⁴ B Wessling, ‘[Wing delivery drone crashes into power lines in Australia](#)’ (The Robot Report, 30 September 2022).

¹⁵ Residents’ submissions cited earlier demonstrate this point. See I McIntyre, ‘[Inquiry into drone delivery system in the ACT](#)’ (06 March 2019); also Anonymous, submission by an 11 years-old resident who describes noise from delivery drones

A final point regarding the Draft Guidelines' privileging of principal operator Google Wing is that this appears to contradict the federal government's strategic plans, such as the 'Buy Australia Plan' and related efforts to build and support the local economy.¹⁶

3. Centre input from local communities in further developing and applying the Guidelines. In particular, revise paragraphs 15, 23, and 29 to broaden the role of local communities and local authorities beyond an exclusive focus on noise complaints and feedback.

The Draft Guidelines barely consider community needs and input. Best-practice planning involves centring the knowledges, preferences, and interests of communities in policies that govern their environments and spaces, especially when that extends into the future. Different communities will assess opportunities and risks differently, relative to their (in)access to infrastructure advantages. Most importantly, communities ought to have the capacity to decide whether they want drone delivery services at all – and, if drone deliveries are to be permitted, the circumstances in which they will be permitted. In urban areas, and especially in regional, remote, and rural areas, local input is fundamental to ecologically- and community-sensitive planning.

The Draft Guidelines make clear that they were iterated to their present form following 14 months of engagement with industry stakeholders, yet with no meaningful citizen engagement. This limits the legitimacy of the Draft Guidelines in guiding local planning authorities around the country. Problematically, the Draft Guidelines do not follow previous recommendations from an array of stakeholders to centre community consultations in the policymaking process surrounding emerging aviation technologies.¹⁷

The only role for community input, according to the Draft Guidelines, is in relation to noise complaints¹⁸ and, relatedly, the monitoring of noise levels.¹⁹ The Department sees its role, in turn, as reviewing those community noise complaints and feedback. What is unclear is how the Department would respond to community concerns that go beyond noise – such as the suite of concerns raised in this submission – and whether these issues would be considered at all, either by the Department or other parts of government? The layered societal impacts of drone delivery services mean that addressing different areas of concern in an isolated and technical manner will be insufficient, and cannot replace explicit approval from communities. With these points in view, the scope of community input should be broadened in the Draft Guidelines to interrogate questions such as whether and when drone operations should be permissible.

4. Revise the Draft Guidelines to align the drone weight classifications with CASA Regulations, avoiding confusion and uncertainty.

The Draft Guidelines' use of the phrase "small to medium sized drones" to refer to drones that are <25kg directly conflicts with the categorisation in the *Civil Aviation Safety Regulation 1998*, which distinguishes between "micro" (up to 250g), "very small" (250g-2kg), "small" (2-25kg), "medium"

as "loud screaming ghosts when they fly over you...They disturb me when I play outside.", see '[Inquiry into Drone Delivery Systems in the ACT](#)' (27 February 2019); also L Fitzgerald, '[Inquiry into Drone Delivery Systems in the ACT](#)' (22 February 2019).

¹⁶ See J Brookes, 'Buy Australia Plan: Govt starts by looking within' (22 November 2022).

¹⁷ See Minderoo Tech & Policy Lab, '[Submission to National Aviation policy Issues Paper on Emerging Aviation Technologies](#)' (31 October 2020); also Whittlesea et al., '[The sky's limit for the electric age of aviation](#)' (31 October 2020); The Hon Ben Carroll MP, '[Victorian Government Submission to the Emerging Aviation Technologies: National Aviation Policy Issues Paper](#)' (01 February 2021).

¹⁸ See p.9 of the Infrastructure Planning Guidelines for Drone Delivery Services, Attachment A, paragraph 15; p.12, Attachment B.

¹⁹ See p.10 of the Infrastructure Planning Guidelines for Drone Delivery Services, Attachment A, paragraph 23, 'Noise'.

(25-150kg), and “large” (more than 150kg) drones.²⁰ The Draft Guidelines reference to drones <25kg as “medium” is incorrect and should be rectified to avoid confusion and uncertainty.

5. Scrutinise the economic and eco-promises made about drone delivery services.

The first substantive paragraph of the Draft Guidelines projects that the emerging aviation industry will add \$14.5 billion to Australia’s GDP and create and sustain 10,000 jobs over the next 20 years. Separately, one of the leading claims of drone delivery proponents is that drones offer a ‘green’ alternative to road-based transit networks, leading to tremendous reductions in emissions.

These claims deserve robust scrutiny. Though the Draft Guidelines do not disclose the source, the numbers cited come from an October 2020 report prepared by Deloitte Access Economics for the Department.²¹ Crucially, the report aggregates multiple markets for drone use, well beyond just delivery. In the Deloitte report, the segment of the drone market for military and industrial applications is estimated to grow to more than \$5.5 billion, while the food delivery market, at \$0.26 billion, is at best 20 times smaller. It appears military and industrial applications drive the bold economic estimates found in the Draft Guidelines – a proviso omitted from their repetition. The 2020 report further caveats that if its predictions of market expansion change, so too will its economic analysis. Australia’s highest inflation rate in more than 30 years, coupled with a global economic slowdown, and worsening business confidence throws some doubt on these predictions.

The fragility of the economic promise is matched by equally shallow claims of environmental sustainability. There is a shrewd focus on “last-mile delivery emissions” to demonstrate drones’ green credentials. But this ignores the emissions generated along the entire logistics chain of this complex, technology-heavy system.

There are compounding emissions created by additional warehousing and the power needs of drones – and that is before we even consider the explosion in single-use packaging brought about by their widespread deployment.²² Further compromising their environmental claims, drones have been demonstrated to crowd birds and wildlife in the sky,²³ leading to reductions in bird observations,²⁴ and environmental protection groups seeking biodiversity impact assessments.²⁵

In conclusion, the Draft Guidelines pre-empt essential consultations and assessments about whether and in what circumstances delivery drones should be used in communities. We urge the Department and local planning authorities to centre attention on foundational questions set out in these recommendations. Demanding that innovation in the drones/robotics industry proceeds in a principled way does not stop innovation – *it saves it.*

²⁰ Part 101, Subpart 101A, 101.022 (Types of RPA), <https://www.casa.gov.au/drones/drone-rules/drone-safety-rules/types-drones>.

²¹ Deloitte Access Economics, [Economic Benefit Analysis of Drones in Australia](#) (October 2020).

²² NZ Herald, [Drones deliver cups of coffee in Australia city with CASA air traffic control](#) (30 August 2021).

²³ G Nunn, [They’re territorial: can birds and drones coexist?](#) (The Guardian, 01 October 2021).

²⁴ See Tuggeranong Community Council, [‘Submission on the Inquiry into Drone Delivery System in the ACT’](#) (20 February 2019).

²⁵ See Environmental Defenders’ Office (ACT), [‘Inquiry into drone delivery systems in the ACT: Environmental Defenders Office ACT Submission’](#) (25 February 2019).

APPENDIX: COMPARATIVE EXPERIENCE WITH E-SCOOTERS

To complement the above recommendations, this Appendix summarises three lessons from the roll-out of electric scooters (e-scooters) in various cities around the world (Figure 1). Similar to delivery drones, e-scooters are marketed as 'sustainable' and 'cost-effective' mobility options, promising jobs, economic prosperity, and emission reductions. This Appendix summarises several high-level insights from research into e-scooter deployments, in order to assist the Department in adopting a holistic view of the ramifications of infrastructure planning choices and decisions.

Figure 1. Three lessons from e-scooters

- **Changing citizens' experiences of public spaces**

E-scooters have been introduced into cities on the same premise as delivery drones – namely, that they don't require any special accommodations to existing infrastructure. A major oversight of this approach is that not all citizens are able-bodied. In cities such as Tamaki Makaurau (New Zealand) and Bergen (Norway), the launch of e-scooters encroached on the ability of blind, weak-sighted, and disabled individuals to navigate streets, to hazardous effect.²⁶ The impact of e-scooters can be so excessive that strong regulations, or even prohibitions, are required – as in Paris (France).²⁷

- **Local consultation can secure citizens' approval**

Experience in Paris demonstrates that e-scooter trials without public consultation can lead to negative public reactions and worse. By contrast, Seattle (US) conducted extensive public deliberation to inform e-scooter regulation before permitting scooters.²⁸ This contrasts with a centralised approach where policy is disconnected from local communities.

- **E-scooters' contribution to sustainability is contestable**

As with drones, the assertion that e-scooters reduce emissions is not a straightforward proposition. Emissions from the product cycle of producing e-scooters, charging, and moving them to and from collection locations via trucks, are all costs that have been poorly accounted for.²⁹ More importantly, evidence suggests that on-demand e-scooters mostly replace trips that were previously undertaken on foot, bikes, or public transport.³⁰ In other words – they are *not* replacing high-emission transit routes: they are creating them. This also raises public health consequences following reductions in incidental exercise; an issue echoed for drones.

Planning authorities have an important role to play in weighing a range of factors and shaping equitable, accessible, healthy, and sustainable local communities. E-scooters have been mainly available and studied in urban cities; but these lessons and considerations are transferrable to non-urban communities. The crux of these lessons is to enable publics to be authors of how their lives are planned and what contributes – positively or negatively – to their wellbeing.

²⁶ See T Bozovic et al., '[How street quality influences the walking experience: an inquiry into the perceptions of adults with diverse ages and disabilities](#)' (2021); also S Sareen, D Remme & H Haarstad, '[E-scooter regulation: The micro-politics of market-making for micro-mobility in Bergen](#)' (2021).

²⁷ See A Chrisafis, '[Pedestrian 'jungle': the row in Paris over rented e-scooters](#)' (The Guardian, 23 November 2022).

²⁸ See C Field & I Jon, '[E-scooters: A New Smart Mobility Option? The Case of Brisbane, Australia](#)' (2021).

²⁹ See B Laa and U Leth, 'Survey of E-scooters users in Vienna: Who they are and how they ride' (2020).

³⁰ Ibid.