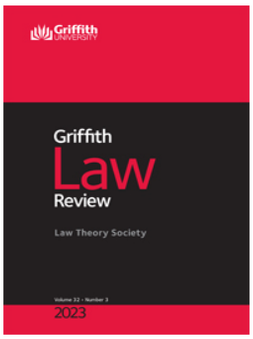

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Safety first: analysing the problematisation of drones

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ABSTRACT

The rise of commercial drone operations in Australia has led to increasing regulatory attention on this emerging aviation sector. For two decades, the Australian Civil Aviation Safety Authority has been an early mover in regulating the safety of drone operations while enabling the growth of the industry. Yet, the more recent influx of commercial drones across different sectors is putting the current legal framework and its ability to mediate conflicting interests to the test. Utilising Carol Bacchi's 'What's the problem represented to be?' framework for policy analysis, this article examines the origins, limitations, and effects of Australia's drone laws. The article identifies that drones are framed chiefly as a safety risk, albeit an inherently manageable one, and details the regulatory consequences of this narrow conception. Crucially, it demonstrates how the centrality of the notion of safety closes off a more holistic assessment of risks and harms, sidelining equally critical concerns about the impact of rising numbers of drones on the sky as a public commons and natural habitat. Overall, the article reinforces the significance of how regulations delineate the scope of the problems they address, with profound implications for the analysis of regulation and policy beyond the remit of drones.

KEYWORDS

Drones; regulation; problematisation; aviation safety; WPR

Introduction

Since 2014, the presence of drones in Australia's skies has steadily increased.[1] This has reached a point where not only the drone industry,[2] but federal and state governments alike,[3]

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[1]The exact number of drones operating in Australia is unknown due to a lack of mandatory registration scheme to date. Estimates of the total number of drones used for recreational and commercial purposes vary wildly – from 50,000 to over one million – depending on the source and methodology used. As of 2019, CASA's best estimate is that the number is growing by approximately 15,000 annually. See Australian Transport Safety Bureau (2020), p. 11; and Explanatory Statement, Civil Aviation Safety Amendment (Remotely Piloted Aircraft and Modal Aircraft – Registration and Accreditation) Act 2019 (Cth), pp. 6 and 8.

[2]See, eg, the Australian Association for Uncrewed Systems' (AAUS) letter to The Hon Catherine King, federal Minister for Infrastructure, Transport, Regional Development and Local Government, expressing gratitude for the federal Government's 'continued support and commitment to the advancement to the drone nascent Advanced Air Mobility (AAM) aviation sectors in Australia': Australian Association for Uncrewed Systems, 'AAUS Letter to Minister King on Emerging Aviation Technologies 20221123', <https://www.aaus.org.au/public/161/files/AAUS%20Board/Advocacy/20221123%20-%20AAUS%20Letter%20to%20Minister%20King%20on%20Emerging%20Aviation%20Technologies.pdf>.

[3]On federal level see, eg, The Hon Catherine King MP, Minister for Infrastructure, Transport, Regional Development and Local Government, 'New research shows benefits will soar as Australia's drone use takes off', <https://minister.

have enthusiastically embraced a future of increased drone uptake. At the same time, the surge of drone activity has prompted intense debate about how to frame regulation.[4] Most government and industry stakeholders are focused on how to support this burgeoning industry while maintaining the highest possible level of safety,[5] while a set of predominantly academic and community representatives continue to voice broader concerns.[6]

The drone industry has long recognised Australia as a global leader in drone regulation.[7] Australia's Civil Aviation Safety Authority (CASA) has provided a clear regulatory framework for civilian drone operations from as early as 2002, when it adopted Part 101 of the *Civil Aviation Safety Regulations 1998* (Cth) (CASR). Other jurisdictions have followed suit and deemed drones to fall within the scope of aviation law and therefore within the remit of domestic and international civil aviation authorities.[8] Yet, with rising numbers of operations,[9] the adequacy of aviation-based drone laws to address the evolving spectrum of risks drones pose is being tested. Broader implications of drones for individuals and society include impacts on privacy,[10] security,[11] the environment,[12] and public amenity.[13] However, the mandate of CASA as the regulator is confined to matters relating strictly to aviation safety. Therefore, risks and impacts outside of that mandate are not considered in the formulation and implementation of existing regulations. Despite recognition of this incongruity by the federal Government[14] and in academic literature,[15] proposed solutions have not yet explored either expanding CASA's remit or creating alternative regulators. Instead, proposals have predominantly focused on extending or amending existing non-drone-specific legislation, such as privacy laws,[16] and on enhancing technical solutions aimed at restricting drones' capacity to cause harm.[17]

This article takes an alternative approach to responding to the limitations of Australia's drone regulations. It suggests that any attention to addressing deficiencies in the law

infrastructure.gov.au/c-king/media-release/new-research-shows-benefits-will-soar-australias-drone-use-takes>; On state level see, eg, Victoria State Government (2022); Queensland Government (2018); see also the ACT Government's Digital Strategy and its related ambition for Canberra to become 'a hub for trialling new ideas' such as drone delivery: ACT Government, Digital Strategy, <https://www.cmtedd.act.gov.au/digital-strategy/current-initiatives/industry/canberra-a-hub-for-trialling-new-ideas>.

[4]See, eg, The Senate Rural and Regional Affairs and Transport References Committee (2018).

[5]See, eg, Civil Aviation Safety Authority (2016), p. 15.

[6]See, eg, Minderoo Tech & Policy Lab, UWA Law School (2020); UWA Minderoo Tech & Policy Lab (2022); Powles and Smith (2022); Bonython Against Drones Action Group (2022).

[7]See, eg, The Senate Rural and Regional Affairs and Transport References Committee (2018), p. 14; Bojan Kitanovic, 'Drone industry in Australia: A complete analysis', <https://thedronesworld.net/drone-industry-in-australia-a-complete-analysis/>, 10 March 2021.

[8]See Du and Heldeweg (2019), pp. 287–289.

[9]The number of commercial drones can be estimated based on the number of Remote Operator Certificate holders registered with the Civil Aviation Safety Authority. Between 2019 and 2023, the number of commercial operators, measured by the number of ReOC holders, grew from 1,700 to over 2,500. See Australian Transport Safety Bureau (2020), p. 11; and Civil Aviation Safety Authority, 'Remotely Piloted Aircraft Operator's Certificate (ReOC) holders', <https://www.casa.gov.au/search-centre/remotely-piloted-aircraft-operators-certificate-reoc-holders>.

[10]See, eg, Butler (2019), p. 1045.

[11]See, eg, Tarr et al (2021), pp. 133–139.

[12]See, eg, Mo and Bonatakis (2022); European Environment Agency, 'Delivery drones and the environment', <https://www.eea.europa.eu/publications/delivery-drones-and-the-environment>; Park et al (2018).

[13]See, eg, UWA Minderoo Tech & Policy Lab (2022).

[14]The federal Government has acknowledged the need for a 'shift in airspace regulation' to mitigate additional risks and impacts beyond safety. See, Commonwealth Department of Infrastructure, Transport, Regional Development and Communications (2021), p. 20.

[15]See, eg, Tarr et al (2021), pp. 375–377.

[16]See, eg, recommendations 2–6 in House of Representatives Standing Committee on Social Policy and Legal Affairs (2014), pp. xiii–xv.

[17]See, eg, Vines et al (2022), pp. 299–372.

is intrinsically limited by leaving unquestioned the way the drone has been conceptualised and put forward as a regulatory object or 'problem' in the law. The dominant drone narrative that has guided legislative and regulatory design[18] is that drones are a type of aircraft, therefore the same regulatory considerations pertinent to traditional aviation apply. In remaining within the confines created by this narrative, attempts to fill regulatory gaps are bound to and may further entrench existing omissions. By contrast, the analysis in this article interrogates the assumptions that have facilitated the current framing of drones, with the objective of reframing them away from being an issue of safety and safety alone. By shining a light on unconsidered and unintended consequences of the prevalent drone narrative underpinning present regulation, this article seeks to emphasise the productive capacity of the law in legitimating particular discourses and, in turn, realities.

This article demonstrates that drones have been conceptualised restrictively through a lens of safety, which has permeated regulatory, policy, and public discourses around drones and their integration into airspace. While other jurisdictions have followed a similar safety-centric approach to drone regulation, the example of Australia is striking due to the scale of domestic commercial drone operations. That and its reputation as a pioneer in the field of drone regulation renders a critical examination of Australia's drone rules particularly acute, though with important transferable lessons.[19]

The analysis is underpinned by political theorist Carol Bacchi's 'What's the problem represented to be?'[20] (WPR) analytical approach. WPR aims at interrogating policies, understood broadly, by reframing them as discursively produced problem statements and illuminating how these have come about.[21] Crucially, WPR pays keen attention to the silences in policy, as they intimate competing discourses and the respective power held by different actors as key factors in the final framing.[22] The foundational goal of scrutinising and destabilising dominant discourses is what makes WPR such a suitable framework to achieve the aims of this article.

Utilising WPR to deconstruct and reframe the problem of the dominant regulatory drone narrative, the article uncovers the source, as well as the profound implications, of the primacy of safety. Foundational to the framing of drones as an aviation safety risk is the presumption baked into the legal framework that drones are an extension of traditional, crewed aircraft. The resulting concentration of their regulation within the body of civil aviation law has left unaddressed a range of risks and challenges beyond physical safety concerns that drones pose to society and the environment. Wider public values, interests, and voices that arguably should inform drone policy development and

[18]See below under 'Regulation' for details on Australia's drone regulatory framework.

[19]It is worth noting that drones are not the only technology that has attracted a safety-first approach to regulation. The introduction of the automobile into society can be drawn on as a suitable analogy here. Like drones, cars combine a multitude of technological capabilities, they have had a significant impact on communities and the environment, yet safety was the defining regulatory (and engineering) challenge from the outset. This focus has been diffused over the last century and there are now laws and regulations in place that address other types of impacts, from emissions and design standards to zoning laws that restrict car access. Yet, initial silences in those areas have meant that the presence of cars on our roads, and indeed the expectation of cities, communities, and society at large adapting to make space for them, have become normalised. Against this backdrop it is striking that the drone is often referred to as the 'horseless carriage of the twenty-first century'. See Clothier et al (2008).

[20]Bacchi (2009).

[21]See Bacchi (2012), pp. 21–24.

[22]See Bacchi and Goodwin (2016), p. 22.

reforms are sidelined. Crucially, Australia's drone laws are mute on the relative values and risks of different purposes of drone operations. Beyond that, the regulatory focus on mitigating safety risks promotes a technocratic approach to Australia's wider drone policy ecosystem. The regulatory hurdles to increased drone uptake are solely operational and technical, effectively silencing a range of other public interest considerations. This article puts forward a re-examination of the drone 'problem' to incorporate and be responsive to more of these values and highlight the role that the public interest ought to play in demarcating acceptable uses of drone technology.

This article proceeds as follows. The first section illustrates the possibility of alternate ways of thinking about, and therefore regulating, drones. It dissects the concept of the drone and explores a range of narratives that have grappled with it over time, of which the current safety narrative is but one. The next section details Bacchi's analytical framework and its application to Australia's drone regulations. Section 3 traces the source of the safety lens that has shaped the prevalent drone problem and identifies the key assumptions that underpin it. Based upon these findings, section 4 interrogates what is silenced, or left unproblematic, through this approach and is thereby absent from current regulations. The article concludes by highlighting some of the pressing questions that have become apparent in light of this analysis.

Defining the drone: names and narratives

What is a drone?

'The drone is an aircraft, it is a computer, and it is also a robot.'[23]

On the face of it, drones are just another type of aircraft, the latest addition in a suite of flying contraptions, from passenger and cargo planes to helicopters and hang gliders. Yet, on closer inspection, drones escape clear-cut definitions.

Like other technological devices, drones can be understood as a 'bundle of technologies'[24] that rest upon the culmination of specific invention and design achievements. In the case of drones, this includes advances in engine design, battery life, global navigation and positioning systems, and cameras.[25] As a confluence of technologies, different components of drone hardware and software may be emphasised when articulating the concept of a drone. Depending on the perspective taken, a drone can be viewed as an autonomous aircraft, an aerial robot, or a levitating camera.

As a protean technology, the meaning we assign to a drone also hinges upon how it is operated and for what purpose. A killing machine, a child's toy, or a link in a logistics chain – the inherent versatility of drones makes them capable of a plethora of uses that span military, recreational, and commercial objectives. The origins of the modern drone lie in defence,[26] and the development of drone technology through the military-industrial complex remains a significant part of the drone innovation ecosystem.[27] Nevertheless, the past two decades have seen commercial interest, and consequently

[23]Adam Rothstein (2015), p. x.
[24]Weller (2020), p. 1.
[25]See Miah (2020), p. 15; Bartsch et al (2016), pp. 14–15.
[26]See, illustratively for the US context, Hall and Coyne (2014), pp. 447 ff.
[27]See Hodgkinson and Johnston (2018), p. 5; Miah (2020), p. 4.

public attention, increasingly turn toward the civilian drone: the use of drones for leisure, sport, and business purposes.[28] These have enabled more widespread use of drones, reinforced by the economies that have been built around them.[29] Drones are now widely available for purchase through big retailers and e-commerce stores such as Amazon or eBay, at ever lower price points, and have become increasingly integrated with other personal devices such as smartphones and tablets.[30] On the commercial side, drones have become ancillary to many industries,[31] from mining, construction, and agriculture, to transport and logistics, which deploy them to perform tasks generally considered as 'dull, dirty, and dangerous'.[32] The past decade has also seen the emergence of entirely new business models that capitalise on the capabilities of drones, for example, drone delivery of consumer goods such as hot coffees, groceries, and meals.[33] The drone has shapeshifted its way from the battlefield to the hobbyist's toolbox to the corporate strategy. In doing so, it has expanded, if not redefined, its meaning, again and again.

Finally, as an emerging, disruptive technology, the narrative we build around the drone is highly dependent on the wider techno-cultural context in which it operates. Its pervasive nature, combined with the variety of morally and societally significant acts it is capable of performing, has converted the drone into a platform for the ongoing negotiation of society's relationship with technology.[34] In popular culture, the drone has become emblematic of both society's highest hopes and its deepest anxieties about its technological future.[35] While horrid images of war and destruction have been a long-standing fixture in the public consciousness of drones, more recently the drone as 'an object of popular desire'[36] fuelled by 'a certain kind of techno-utopian allure',[37] appears to have overshadowed its military alter ego. In this sense, the drone is an 'empty vessel'[38] that is filled with meaning and purpose only through its contextualisation in today's political, economic, and cultural struggles.

A drone by any other name

In line with its multifaceted history and the multitude of contexts within which it exists, the drone has been given many names over the course of its existence.[39] These include 'remotely piloted aircraft' (RPA), 'unmanned aerial vehicle' (UAV), 'unmanned aircraft system' (UAS), 'unmanned aircraft' (UA), 'remotely piloted vehicle' (RPV) and 'remotely

[28]See Hodgkinson and Johnston (2018), p. 10.
[29]See Miah (2020), pp. 15–16. The global consumer drone market is currently estimated at USD 4 billion, the global commercial drone market USD 30 billion. See Grand View Research, 'Consumer Drone Market Size, Share & Trends Analysis Report 2022 – 2030', <https://www.grandviewresearch.com/industry-analysis/consumer-drone-market> and Grand View Research, 'Commercial Drone Market Size, Share & Trends Analysis Report 2023 – 2030', <https://www.grandviewresearch.com/industry-analysis/global-commercial-drones-market>.
[30]See Bartsch et al (2016), p. 69.
[31]See Tarr et al (2021), p. 17.
[32]Bartsch et al (2016), p. 14.
[33]See Wing, <https://wing.com/en_au/australia/canberra/>.
[34]See Miah (2020), p. 3.
[35]See Miah (2020), p. 3.
[36]Rothstein (2015), p. xii.
[37]Rothstein (2015), p. xii.
[38]Miah (2020), p. 3.
[39]See Hodgkinson and Johnston (2018), pp. 2–3; Tarr et al (2021), pp. 3 and 275; International Civil Aviation Organisation, 'Unmanned Aviation Frequently Used Terms', <https://www.icao.int/safety/UA/UASToolkit/Pages/Frequently-Used-Terms.aspx>.

piloted aircraft system' (RPAS).[40] There are subtle differences in meaning between its labels (which predominantly relate to nuances in technological capabilities), and as a result no universally agreed definitions of what a drone is. UA, UAV, RPV and RPA refer to the vehicle or aircraft itself, while UAS and RPAS include the aircraft, associated ground control units and any other components necessary for its operation. Terms using 'remotely piloted' necessarily limit their applicability to types of aircraft that need a human operator (remote pilot), whereas 'unmanned' includes aircraft that can operate autonomously, i.e. without any human intervention. Additionally, there are differences in use depending on the organisation and context. The International Civil Aviation Organisation (ICAO) and the European Aviation Safety Agency (EASA) predominantly use UA/UAS and RPA/RPAS, which also appears to be the preferred terminology used by Australia's CASA. CASA broadly distinguishes between model aircraft, which are drones flown for recreation, and RPAS, operated for commercial purposes.[41]

Further complicating this landscape are the negative connotations attached to the term 'drone' due to its historic use in the context of warfare and other military activity.[42] This has led to controversy within the drone industry and to concerted, often unsuccessful, efforts to popularise the use of alternative, more neutral terms.[43] Nevertheless, with increased civilian use, 'drone' is now in popular usage as a catch-all for different types of remotely piloted aircrafts and will be used for the purposes of this article, unless the context calls for more nuanced terminology.

Whether this bundle of technologies is viewed as a versatile tool for consumers, commerce, or the military, it is a site of discourse, which means that the definition of the drone lies in the eye of the beholder. The result is a range of diverging narratives that engage with the concept of the drone. This article focuses on the narrative produced by public institutions through legislative and regulatory processes: the drone as a regulatory object.

Problematising the drone

The creation of 'problems'

If we accept that there are many different aspects to drone technology, with its aircraft components being but one, albeit crucial, characteristic, it follows that the way drones have been treated as regulatory objects represents a choice, whether deliberate or inadvertent, about which aspects of this technology are considered pertinent to the law. This is not only significant because of the direct effects of the regulation, i.e. what is permitted and what is not, and what remains unaddressed. It also matters because the chosen regulatory framework has indirect effects that determine the scope and nature of the wider drone discourse.

To explore these effects further, this article draws on the concept of 'problematisation' to critically analyse the legal framing of drones. The term problematisation has been adopted in the work of various political and policy theorists, with nuances in

[40]The author has sought to avoid the use of 'manned' and 'unmanned' aviation in favour of more gender-inclusive terms. Exceptions are made for institutionally used terms and direct quotes from other sources.
[41]*Civil Aviation Safety Regulations 1998* (Cth) Parts 101.021 and 101.023 respectively.
[42]See PytlikZillig et al (2018), pp. 80–91.
[43]See Miah (2020), p. 4.

meaning.[44] Depending on the context and scholarly tradition, it can be understood as a form of critical analysis, or as the process of designating something as a 'problem'. Therefore, to problematise something can refer to the process of interrogating an issue by calling into question the presuppositions that are at its basis; or it can refer to the way something is put forward – *represented* – as a 'problem'.[45] The inverted commas point to the foundational proposition that a problem is created by being treated, analysed, and described as such. Importantly, this does not deny the existence of the object that is being put forward as a problem. It does, however, call into question and thereby destabilises the way a particular issue has become thought of as a 'problem'.

Carol Bacchi and 'What's the problem represented to be?'

Political theory and policy scholar Carol Bacchi builds on the concept of problematisation as the process of putting something forward as a problem and uses it to interrogate the problem representations contained in policies. The Foucauldian-influenced post-structuralist notion of problematisation emphasises the role of governmental practices in producing 'problems', i.e. creating problem representations. It highlights the way in which problematising an issue creates the boundaries for how it is understood, by delineating what becomes part of the public consciousness and what is removed from view.[46]

Through her original approach to policy analysis entitled 'What's the problem represented to be?' (WPR)[47], Bacchi provides a framework within which it is possible to call into question deep-seated assumptions, beliefs and logics that appear objective, fixed, or inevitable.[48] Consisting of seven interlinked questions and steps, WPR aims to scrutinise the way in which a given policy represents (ie, problematises) the 'problem' it purports to address (Figure 1).

The basis for Bacchi's approach to policy analysis is the simple but powerful proposition that every policy is an implicit statement about a 'problem' (a problematisation). Since policies are designed to create change, it must follow that whatever they seek to change has been identified as a problem to be solved or fixed. This approach is a novel way of thinking about policy compared to other analytical frameworks, as it challenges the common perception of policy as being applied to problems that sit outside of and separate from the policy process, ready to be solved. Rather, it suggests that 'problems' are created as part of the policy process, thereby the 'problem' is as contested as the solution.[49] By identifying that 'problematisations are elaborated in discourse',[50] Bacchi connects to the central role of power in constructing meaning and setting the terms for engagement with a given subject. Therefore, the WPR approach is an expression of the realisation that policy is not created in a vacuum, but in a specific context of history, ideology, and power. The significance of this approach is its potential to uncover the assumptions and premises that underpin the formulation of policy, law, and indeed governing processes more generally. According to Bacchi, an interrogation of the

[44]See Bacchi (2015), pp. 1–2.
[45]See Bacchi (2015), pp. 2–3.
[46]See Foucault (1983).
[47]See Bacchi (2009), p. xii.
[48]See Adams (2017).
[49]See Bacchi (2009), p. 25.
[50]Bacchi (2009), p. 35.

Question 1: What's the problem represented to be in a specific policy or policies?

Question 2: What deep-seated presuppositions or assumptions (conceptual logics) underlie this representation of the "problem" (*problem representation*)?

Question 3: How has this representation of the "problem" come about?

Question 4: What is left unproblematic in this problem representation? Where are the silences? Can the "problem" be conceptualized differently?

Question 5: What effects (discursive, subjectification, lived) are produced by this representation of the "problem"?

Question 6: How and where has this representation of the "problem" been produced, disseminated, and defended? How has it been and/or how can it be disrupted and replaced?

Step 7: Apply this list of questions to your own problem representations.

Adapted from: Bacchi and Goodwin (2016) p. 20.

Figure 1. 'What's the problem represented to be?' approach.

'problems' that are presumed to exist and how they are perceived allows for important insights into the 'thinking' that informs governance.[51]

Legislation as the object of WPR analysis

The understanding of policy at the base of WPR is broad and the selection of texts for analysis is part of the interpretive exercise.[52] Any text, mechanism or technology that is prescriptive in the sense of guiding conduct, or used to govern, in the broadest sense, will contain important problematisations.[53] Among those, however, the way an issue is framed and put forward in legislation is particularly powerful as these problematisations tend to become dominant and therefore 'take on lives of their own'.[54] Here, WPR intimately supports the fundamental aim of this paper: to critically examine the prevalent framing of drones through the law and to explore its origins, limitations, and effects. Australia's drone laws are principally set out in Part 101 'Unmanned Aircraft and Rockets' of the *Civil Aviation Safety Regulations 1998* (Cth) (CASR). This legislation forms the basis for the analysis that follows. Yet, given the article's aim to probe critically the assumptions and influences bearing on the regulatory framework, it will also draw on supplementary material, such as ministerial and regulatory statements and parliamentary inquiry reports, which provide crucial insight into legislative intent and shed light on different discourses.

[51]See Bacchi and Goodwin (2016), p. 43.
[52]See Bacchi (2009), p. 21.
[53]See Bacchi and Goodwin (2016), p. 18.
[54]Bacchi (2009), p. 33.

In applying WPR to Australia's drone rules, the questions and steps outlined above are used as a guide for lines of inquiry that the following sections will pursue. Section 3 identifies the dominant problematisation of the drone in legislation and traces its origins. Corresponding to WPR questions 1, 2 and 3, it situates the drone within the legal landscape and dissects the assumptions and presuppositions that have enabled the identified problem representation. Section 4 moves to interrogate the effects and silences that accompany it (WPR questions 4 and 5), and finally points to the wider impact of the problematisation outside the law, through its reproduction and repurposing in more recent government policies (WPR question 6).

Regulating the drone: creating a drone 'problem'

The drone as a type of aircraft

History

While the value we assign to the drone and the symbolic space it occupies are in flux, the physical space it inhabits is undeniable. It is the fact that the drone takes to the sky that has confined it, in regulatory terms, to aviation law.

Drones have historically developed alongside their crewed counterparts, and it is therefore unsurprising that they have been part of aviation law since its inception.[55] Indeed, Article 8 of the International Civil Aviation Organisation's (ICAO) founding treaty, the *Convention on International Civil Aviation 1944* (*Chicago Convention*), explicitly speaks to the regulation of 'pilotless aircraft', stipulating the terms of overflight of such an aircraft in foreign territory. While the practical applicability of this provision is thus far rather limited (civilian drones rarely cross international borders in their operations), it serves as the foundation and starting point for the regulation of drones on the international level. There are other articles[56] of the *Chicago Convention* and existing Standards and Recommended Practices (SARPs),[57] which may apply to drones by virtue of their applicability to aircraft generally.

ICAO defines aircraft as 'any machine 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'.[58] Due to the absence of a definition of 'pilotless aircraft' in the sense of Article 8, there was historic ambiguity whether drones (both remotely piloted and autonomous) were indeed aircraft within the meaning of the Convention.[59] This was resolved in 2003, when member states formally endorsed a definition of 'pilotless' aircraft:

> An unmanned aerial vehicle is a pilotless aircraft, in the sense of Article 8 of the Chicago Convention, which is flown without a pilot in-command on-board and is either remotely

[55]See Bartsch et al (2016), p. 39.
[56]See Hodgkinson and Johnston (2018), p. 17.
[57]SARPs are technical specifications adopted by the Council of ICAO in accordance with Article 37 of the Chicago Convention to achieve 'the highest practicable degree of uniformity in regulations, standards, procedures and organization in relation to aircraft, personnel, airways and auxiliary services in all matters in which such uniformity will facilitate and improve air navigation'. See International Civil Aviation Organisation (2011), p. 2.
[58]International Civil Aviation Organisation (2011), p. ix.
[59]See Fiallos (2016), p. 32.

and fully controlled from another place (ground, another aircraft, space) or programmed and fully autonomous.[60]

Therefore, any uncrewed aircraft is a 'pilotless aircraft' in the sense of Article 8 of the Chicago Convention and the operation of civil and commercial drones fall within its scope.

Regulation

The regulatory approach taken by ICAO centres around the qualification of all drones as aircraft, while identifying the operational differences to their crewed counterparts that require bespoke provisions. This means that by default the existing aviation regulatory framework applies and drones can be incorporated into it, provided the identified differences can be addressed.[61] This approach has been adopted by most national civil aviation regulators, including Australia's CASA.

Through CASA, Australia has been at the forefront of the development of civilian drone regulation globally, including the passing of the world's first drone-specific legislation in late 2001.[62] In anticipation of increasing civil drone operations, the passing of Part 101 CASR was significant in providing a basis for future rulemaking and oversight for CASA. However, due to the fact that there were few active commercial operators and therefore limited operational experience to draw from at the time, it included little detail on issues such as pilot requirements, risk management procedures and airworthiness approval processes.[63] Still, the legislation was hailed as ground-breaking for its flexible approach to regulation and striking the balance between enabling technological progress while maintaining the safety of other airspace users, people, and property.[64]

Responding to a steep rise of both recreational and commercial drone operators and ensuing pressure on the regulatory framework, Part 101 CASR went through major amendments in 2016, aimed at cutting red tape for 'lower risk' RPAS operations, thereby encouraging innovation and realising commercial opportunities.[65] The *Civil Aviation Legislation Amendment (Part 101) Regulation 2016* introduced new weight classifications for drones, added an 'excluded' category of drones which trigger reduced regulatory requirements, and established standard operating conditions.[66] In effect, these amendments changed the proxy for decisive risk factors of drone operations from the nature of the drone operation based on the recreational/commercial divide to the weight of the drone used. Depending on the type of operation, the weight of the drone may influence which qualifications, accreditations, certifications, and operational restrictions apply.[67]

The 2016 amendments to Part 101 CASR attracted a lot of criticism from different sections within the aviation community since recreational users, but also commercial operators using smaller (lighter) drones, were exempt from any requirements to complete formal training prior to operating a drone. Following a federal Senate inquiry into

[60]Eleventh Air Navigation Conference, ANConf/11, Montreal (22 September – 3 October 2003). This text was included as part of the ICAO *Global Air Traffic Management (ATM) Operational Concept*, Doc 9854 AN/458 (2005), 82, and reiterated in Annex 7 on *Aircraft Nationality and Registration Marks* to the Chicago Convention (at Definitions).
[61]See, Bartsch (2018), p. 893.
[62]See *Civil Aviation Safety Regulations 1998* (Cth) Pt 101.
[63]See Bartsch (2018), p. 901.
[64]See The Senate Rural and Regional Affairs and Transport References Committee (2018), p. 14.
[65]See The Senate Rural and Regional Affairs and Transport References Committee (2018), p. 15.
[66]See *Civil Aviation Legislation Amendment (Part 101) Regulation 2016* (Cth).
[67]See Civil Aviation Safety Authority (2023).

regulatory requirements on the safe commercial and recreational use of RPAS,[68] which confirmed concerns around the de-facto de-regulation of the sector through the 2016 amendments, Part 101 underwent another round of reforms in 2019.[69] The *Civil Aviation Safety Amendment (Remotely Piloted Aircraft and Model Aircraft—Registration and Accreditation) Regulations 2019 (Cth)* established more stringent registration and accreditation requirements to address difficulties in enforcing safety rules due to the inability to reliably identify operators. They also require prospective operators to complete a short online course and pass a corresponding examination to gain accreditation.[70]

The legislative genesis of Australia's drone regulations is instructive as to CASA's regulatory philosophy and dual objective of enabling technological innovation and the integration of drones into the Australian aviation system while upholding the highest possible level of safety.[71]

The drone as an aviation safety risk

The regulatory aim of aviation safety and its limited scope

Aviation safety is a fundamental principle and the core objective of civil aviation law. The ICAO has stated explicitly that 'the principal objective of the aviation regulatory framework is to achieve the highest possible uniform level of safety'.[72] This central goal is reflected in the statutory aims of CASA, which has safety written not only into its name but into its central purpose: 'safe skies for all'.[73] Section 9A of the *Civil Aviation Act 1988* (Cth), which establishes CASA as a federal authority, stipulates that in conducting its functions the safety of air navigation is the most important consideration. CASA has continued to affirm the primacy of safety specifically in relation to drone regulation in its regulatory roadmap for RPAS and advanced air mobility released in July 2022, which outlines its 15-year vision for Australia's drone regulatory regime.[74]

Given the centrality of safety, a brief discussion of what it means in the context of aviation, and particularly in relation to drones, is warranted. The ICAO defines safety as 'the state in which the possibility of harm to persons or of property damage, is reduced to and maintained at or below an acceptable level, through a continuous process of hazard identification and safety risk management'.[75] The type of harm envisaged is very narrow, as can be deduced through a close reading of the definitions of other safety-related terms. A 'hazard'[76] is defined as the source of potential harm or a condition or an object with the potential to cause or contribute to an aircraft incident or accident. An 'accident' refers to occurrences which lead to fatal or serious injury of a person, adverse effects to the structural integrity, performance or airworthiness, or damage to an aircraft.[77] 'Incident' is defined as an occurrence, other than an accident, which affects or could affect the safety

[68]See The Senate Rural and Regional Affairs and Transport References Committee (2018).
[69]See The Senate Rural and Regional Affairs and Transport References Committee (2018).
[70]Explanatory Statement, Civil Aviation Safety Amendment (Remotely Piloted Aircraft and Modal Aircraft – Registration and Accreditation) Regulations 2019 (Cth), p. 1.
[71]See, eg, Civil Aviation Safety Authority (2016), p. 4.
[72]International Civil Aviation Organisation (2011), p. 4.
[73]Civil Aviation Safety Authority, 'Who we are', <https://www.casa.gov.au/about-us/who-we-are/about-casa#>.
[74]See Civil Aviation Safety Authority (2022a), p. 5.
[75]International Civil Aviation Organisation (2018).
[76]See Civil Aviation Safety Authority (2022b), p. 32.
[77]See Civil Aviation Safety Authority (2022b), p. 30.

of operation of an aircraft.[78] A 'safety risk' describes the predicted probability and severity of the consequences or outcomes of a hazard.[79] Taken together, it is clear that the concept of aviation safety attends exclusively to the mitigation of potential *physical* harms to persons and damage to property. It therefore excludes physical harms on wildlife or the environment and non-physical harms such as impacts on privacy, public amenity, or mental health.

The ICAO has clarified that the concept of aviation safety extends to drones, adding that safety in the case of UAS 'means ensuring safety of any other airspace user as well as the safety of persons and property on the ground'.[80] In practical terms, the types of aviation safety risks that Part 101 CASR envisages and seeks to mitigate are potential collisions of drones with piloted aircraft, a person, property, or another drone, or debris from a drone falling onto a person or property, be it through illegal or irresponsible use, equipment malfunction, system failure or human error.[81]

The problematisation at the heart of aviation law

Given the central role of aviation safety to civil aviation regulation, most of the body of aviation law can be viewed as a framework designed to reduce and mitigate risks to aviation safety. In this line of thinking, any type of aircraft (being the object of aviation law) can be framed as an aviation safety risk that is to be managed through technical and operational regulation. This logic has been extended to drones and has defined the regulatory focus and scope to date. Responding to the first question of Bacchi's WPR framework, the 'problem' represented within Australia's drone regulations is that drones have the potential to negatively affect aviation safety outcomes. In other words, the drone, through Australia's drone regulations, has been problematised as an aviation safety risk.

The drone as an extension of conventional aircraft

Challenging underlying assumptions

As shown above, the development of regulations for uncrewed aviation has so far been reactive and piecemeal, building onto a general mandate for the regulation of aircraft and growing, over time, from there.[82] And while it is plausible that regulations for drones as flying objects originated and evolved from within civil aviation law, Bacchi's WPR approach requires a deeper analysis. Question 2 of WPR is designed to identify the key premises a particular problematisation relies on.[83] Unpicking the underlying assumptions uncovers how a particular problematisation was possible to emerge in the first place, and which conceptual logics and discourses have contributed to its construction.[84]

The structure and substance of current drone regulations reveal that the dominant problematisation of the drone as an aviation safety risk assumes that it remains a mere extension or iteration of conventional aviation. Moreover, the problematisation rests

[78]See Civil Aviation Safety Authority (2022b), p. 32.
[79]See Civil Aviation Safety Authority (2022b), p. 34.
[80]International Civil Aviation Organisation (2011), p. 4.
[81]See Tarr et al (2021), p. 167.
[82]See Tarr et al (2021), p. 379.
[83]See Bacchi (2009), p. 7.
[84]See Bacchi and Goodwin (2016), p. 21.

upon the presupposition that the body of civil aviation law provides an appropriate regulatory regime to harness potential benefits and mitigate potential risks presented by drones.

Yet, the current problematisation neglects the existence of differences between drones and other types of aircraft that could be pertinent to their regulation. At the most basic level drones are operated without a pilot onboard (or in the case of fully automated drones indeed without a pilot at all) and in much lower levels of airspace than any other type of aircraft. Beyond that, drones are characterised by what Bartsch et al have coined the '"five A" attributes of unmanned aircraft'.[85]

Agility and adaptability. Compared to piloted aircraft, drones do not seem to have a natural physical limit in their operational capability. The variety of shapes, sizes, weight categories and technological specifications that they come in means they can operate in extremely low altitude, hard-to-reach places and in ways that have been closed off to conventionally piloted aircraft. As a result of their agility and as evidenced by an ever-increasing number of (speculative and actual) use cases and applications, drones can be easily adapted for different purposes and operational needs.[86]

Accessibility and affordability. Whereas traditional aviation has a very high threshold for participation – possession and operation of a piloted aircraft is contingent on extensive training and certification, which is associated with high expenses – drones have become commercialised to a point where anyone can buy one off the shelf for a couple of hundred dollars, or indeed even build their own, with minimal training and certification (although it should be noted that the educational requirements are changing within Australia's drone rules, in response to increasing concerns about damage uneducated hobbyists may cause).[87] It is this characteristic that has led to drones being hailed for 'democratising the sky for humanity'.[88]

Anonymity. Another effect of the high accessibility of drones paired with a lack in comprehensive mandatory registration (which is firmly established in traditional aviation),[89] is that drones largely allow for anonymity in their operations. This in turn impacts on issues of liability and enforcement of existing rules.[90]

Differences are sidelined

Within the current framing of drones, these fundamental differences are reduced to characteristics – the 'delta'[91] – that may require some specific rules in addition to generally applicable aviation provisions, but still fit within the body of aviation law. This approach disregards the way in which these features challenge the basic assumptions

[85]Bartsch et al (2016), p. 11.
[86]See Thomas Frey, '192 Future Uses for Flying Drones', <https://futuristspeaker.com/business-trends/192-future-uses-for-flying-drones/>.
[87]See Brown et al (2019).
[88]See Harrison Wolf, 'We must regulate drones, to democratise the sky for humanity', <https://www.weforum.org/agenda/2018/06/drone-regulation-is-necessary-to-democratize-the-sky-for-humanity/>.
[89]See *Civil Aviation Safety Regulations 1998* (Cth) Part 47.
[90]See The Senate Rural and Regional Affairs and Transport References Committee (2018), p. 74.
[91]Bartsch (2018), p. 893.

that underpin aviation law, including the primacy of safety to the exclusion of other considerations. Some of the defining characteristics of drone technology mean that the regulatory context and challenge are wildly different to those in response to which most of civil aviation law was conceived. Not only are there so many more potential operators and a whole host of different use cases, but drones also operate in a part of airspace that has previously not been utilised for aeronautical activity. This in and of itself prompts (or should prompt) questions that are not relevant in the same way to traditional aviation: the potential for privacy infringements or impacts on public amenity is a completely different one in the case of drones. Additionally, the accessibility of drones has enabled the entrance of new actors from other industries, such as agriculture, mining, media, logistics etc., into the traditionally contained field of aviation. This raises questions around regulatory responsibilities and collaboration across different sectors. Finally, the sheer number of drones, again a result of their accessibility, is in and of itself a regulatory challenge that stands out from traditional aviation regulation.

The types of aircraft and aviation activities that civil aviation law had to make provisions for prior to the wide-spread proliferation of uncrewed aircraft have been essentially uniform in terms of their regulatory requirements. Whether a passenger carrier, cargo plane or sports rotorcraft – rules around pilot qualifications, airworthiness of the aircraft and air traffic management had to address the same set of underlying risks and issues. Yet drones generally venture into levels of airspace below 120 meters, their maximum permitted flight altitude, making it more likely for them to have much closer interactions with ground-based infrastructure.[92] As opposed to traditional aircraft, which are bound to designated aerodromes, drones can also take off from and land at virtually any given point. Taken together, these differences suggest the necessity of enhanced considerations of the ground environment within the regulatory framework.[93]

Indeed, drones push the boundaries of key features of civil aviation in the traditional sense, which have informed the type and extent of regulatory oversight and rules around safety in the past. Clarke and Bennet Moses observe: 'Aviation regulation has been primarily concerned with piloted civilian aircraft, above a given size and generally operating above a given height and in sectors adjacent to airports'.[94] This raises the question whether drones can still confidently be placed on the spectrum of types of aircraft that aviation law was set up to regulate, or whether what differentiates drones from other types of aircraft, taken together, amounts to an entirely separate type of object, at least for regulatory purposes.[95]

Rethinking the drone: what the drone 'Problem' hides

The previous section highlighted how the assumptions underpinning the dominant problematisation of the drone in Australian regulation are flawed and conceal some of the practical difficulties facing the current regulatory regime. It speaks to the challenge for CASA to fulfil its mandate by ensuring drones operate within acceptable levels of safety,

[92]See Civil Aviation Safety Authority, 'Drone safety rules', <https://www.casa.gov.au/drones/drone-rules/drone-safety-rules>.
[93]See Tarr et al (2021), p. 277.
[94]Clarke and Bennett Moses (2014), p. 272.
[95]Different commentators have observed that there are good reasons why drones should be regulated separately to classic aviation. See, eg, Morrison et al (2021), p. 278; see also Du and Heldeweg (2019), p. 286.

meaning they exhibit an equivalent level of safety to conventional aviation.[96] These are important considerations in assessing the adequacy of the current drone regulatory framework to do what it was designed to do. However, following Bacchi's prompts, an inquiry into the *silences* and *discursive effects* produced by the problematisation of the drone as an aviation safety risk reveals further and pressing limitations.

Blind spots: silences of the drone problematisation

The scope of current regulations and the mandate of CASA delineate the limits of, and thereby what is left unaddressed or unproblematic within, the dominant drone problematisation. Two key silences can be identified: the regulatory neglect of non-physical harms, and the stark regulatory indifference to different drone use-cases.

Silence on non-physical harms

Section 9A of the *Civil Aviation Act 1988* (Cth) makes explicit that 'in exercising its powers and performing its functions, CASA must regard the safety of air navigation as the most important consideration'. It is worth noting that subsection 2 gives limited scope to CASA to consider 'as far as is practicable' environmental impacts of aircraft operations in discharging its duties. Yet, a contextual reading of this provision confirms the purview of CASA is, above all else, safety.

As the discussion of the concept of aviation safety demonstrates, the remit of aviation safety regulation is that of *physical* safety. The consequence is that safety is very narrowly conceived, excluding by omission a range of harms that potentially arise from drone usage. Broader impacts on individuals, society and the environment are unaddressed by current regulations. The absence of drone-specific regulations around noise,[97] privacy, and environmental impacts, and their follow-on effects for the physical and mental health and amenity of impacted communities as well as for wildlife, has proven detrimental. This is amply illustrated through the community response to a drone delivery trial conducted by Wing Aviation, a subsidiary of Google parent company Alphabet, in the ACT suburb of Bonython in 2018–19.[98] Aggrieved residents, who were impacted by the visual and noise pollution presented by the delivery drones, found striking deficiencies in the governance and oversight of the drone operations beyond safety, which was administered by CASA. The repeated deference by the ACT and Federal Government alike to safety regulations as the singular regulatory framework applicable to drones specifically, evidenced throughout the delivery drone trial and a subsequent ACT Parliamentary Inquiry into said trial, is a clear manifestation of the broader dominance of the aviation safety problematisation of drones.[99] Indeed, while noting its statutory limitation to addressing issues around aviation safety only, CASA, in its submission to the Inquiry, stated that drones were 'comprehensively' regulated through the

[96]See Bartsch (2018), 701; Clothier et al (2015), p. 1168.
[97]In relation to noise impacts, it should be noted that in December 2021, following a review of the *Air Navigation (Aircraft Noise) Regulations 2018* (Cth), a new framework for the management of drone noise was introduced. The review was triggered by a 2019 ACT Legislative Assembly Inquiry into drone delivery systems in the ACT, during which evidence of the lack of regulatory oversight in relation to drone noise impacts and enforcement of existing noise regulations emerged.
[98]See Bonython Against Drones Action Group (2022).
[99]See ACT Government (2019), pp. 6ff.

introduction of Part 101 CASR in 2002.[100] Statements such as this insinuate that when it comes to drone regulation, only safety matters, and safety is under control.

Challenges in the application of non-drone-specific laws

The absence of drone-specific legislation outside Australia's civil aviation safety framework does not preclude the application of other principles, rules and regulations that are part of other regulatory regimes. For example, privacy,[101] security,[102] liability,[103] or environmental protection[104] laws may still be applicable to certain aspects of drone operations. Yet, the practical application and enforcement of existing laws to the technological chameleon that is the drone present challenges on two fronts. First, the 'five A' attributes of drones referenced above call into question the adequacy and effectiveness of existing laws in reining in the distinct risks that drones pose. Non-drone-specific laws were designed with neither the technological capabilities of drones nor the scale of their use within legislative intent or imagination. Second, constitutional challenges arise at the intersection of aviation law and other areas of law, and drones exacerbate existing difficulties in navigating overlapping regulatory regimes in Australia, which are often fractured across federal, state, and local levels.[105]

The issue of applying existing privacy laws to drones illustrates both those points. Australia's privacy regime can be described as a complex 'patchwork' of Commonwealth, State and Territory laws and common law principles.[106] The right to privacy is federally enshrined in the *Privacy Act 1988* (Cth), which sets out principles that govern the collection, management, and disclosure of personal information. However, the Act, as well as States and Territories' own privacy laws, does not apply to actions by private citizens and several exempted groups and organisations, which leaves uncovered the collection of personal data through, for example, recreational drone use. Furthermore, the Act does not protect against the physical invasion of citizens' private seclusions, such as their backyards – one of the primary concerns of the public in relation to small drones in particular.[107]

Common law protections of privacy through the torts of trespass and private nuisance may provide further avenues to pursue legal action, yet their practical application to drone technology is significantly limited. The ability of a drone to capture photo or video footage from great height and distance without compromising on quality of the imagery challenges the key element of physical proximity in claims of trespass or intrusion.[108]

Following a 2014 Commonwealth Parliamentary inquiry into drones and the regulation of air safety and privacy, the Committee handed down several recommendations to increase the adequacy of Australia's privacy regime to protect against 'privacy-invasive

[100]Civil Aviation Safety Authority (2019), p. 1.
[101]See, eg, Clarke (2014), pp. 286–305.
[102]See, eg, Altawy and Youssef (2017).
[103]See, eg, Stewart (2016).
[104]See, eg, Booker (2019), p. 93.
[105]See Tarr et al (2021), p. 279.
[106]See House of Representatives Standing Committee on Social Policy and Legal Affairs (2014), p. 34.
[107]See Bartsch (2018), p. 910.
[108]See Butler (2019); Tarr et al (2021), p. 173.

technologies',[109] including drones. The recommendations of Commonwealth legislative reform point to questions around the extent to which the Federal Government is constitutionally empowered to legislate in relation to drones. The Federal Government's remit regarding civil aviation has been delineated by the Australian High Court, confirming the federal power to regulate the aviation safety of inter- and intrastate air navigation, while leaving open the possibility of concurrent State and Territory jurisdiction on non-safety related issues.[110] Hence, attempts by the Federal Government to regulate all aspects of drone operations, including privacy, and thereby 'cover the field', would be based on constitutionally shaky ground.[111] Against this backdrop, and in pursuance of regulatory consistency, the Federal Government has adopted a whole-of-government approach to drone regulation that relies on coordination between different levels of government and the issuance of guidance material to relevant State and Territory authorities and operators.[112]

Regulatory indifference to different use-cases

Australia's current drone regulatory framework relies on four key pillars: classifications of types of drones by weight; a regulatory distinction between recreational and commercial operations; a default set of drone safety rules; and a set of instruments which CASA has at its disposal to allow for exemptions to those default rules.

The drone safety rules are also known as standard operating conditions and are contained in Subpart 101.C CASR.[113] They stipulate the limits of where, when, and how a drone can be operated. Specific rules targeted at safety include a maximum operating height of 120 meters, an operator's duty to maintain a distance of no less than 30 meters from people, and a general prohibition of flights over populous areas, such as beaches, parks, busy roads or events, or near aerodromes or emergency operations. Furthermore, drone operators must not fly more than one drone at a time and always keep their drone within visual line-of-sight, which means they need to be able to always see it with their own eyes (rather than through a monitor or goggles).[114] If operators wish to go beyond those limitations, they may be able to apply to CASA for additional approvals, authorisations, permissions, or exemptions.[115]

The main proxy for different levels of assumed safety risk associated with drone operations set out within the regulatory regime is the distinction between different types of drones by weight.[116] The 2016 amendments to Part 101 CASR introduced the categories of micro (up to 250g), very small (250g to 2kg), small (2-5kg), medium (25-150kg) and large (more than 150kg) drones.[117] The combination of the type of drone used and

[109]House of Representatives Standing Committee on Social Policy and Legal Affairs (2014), p. xiv.
[110]See *Work Health Authority v Outback Ballooning Pty Ltd* (2019) HCA 2; Tarr et al (2021), p. 280.
[111]Minderoo Tech & Policy Lab, UWA Law School (2020).
[112]See Department of Infrastructure, Transport, Regional Development, Communications and the Arts, 'Privacy Policy', <https://www.drones.gov.au/policies-and-programs/policies/privacy-policy>.
[113]See Civil Aviation Safety Authority, 'Drone safety rules', <https://www.casa.gov.au/drones/drone-rules/drone-safety-rules>.
[114]See Civil Aviation Safety Authority, 'Drone safety rules', <https://www.casa.gov.au/drones/drone-rules/drone-safety-rules>.
[115]See Civil Aviation Safety Authority (2022c).
[116]See Civil Aviation Safety Authority, 'Types of drones', <https://www.casa.gov.au/drones/drone-rules/drone-safety-rules/types-drones>.
[117]See *Civil Aviation Legislation Amendment (Part 101) Regulation 2016* (Cth).

whether the operation is recreational (model aircraft) or commercial (RPAS) in nature determines the applicability of additional regulatory constraints, such as certification, registration, and accreditation requirements.

Beyond the recreational/commercial dichotomy, Part 101 CASR does not distinguish between different purposes of drone operations. This again reflects the restrictive concept of aviation safety underpinning the regulatory framework: distinctions in the law in terms of regulatory requirements are made only to serve as proxy for different levels of assumed safety risks. In the context of physical safety, the distinction of types of drones by weight – based on the presumption that heavier drones have the potential to cause greater damage – is reasonable. When a drone falls out of the sky, the level of damage caused to people and objects on the ground will be determined by the weight and payload of the drone, not by the purpose of its operation. In other words, the problematisation of drones as an aviation safety risk renders the purpose of any given drone operation largely irrelevant.

A crucial result of this indifference is that current regulations are incapable of mediating commercial and public interests (beyond safety) which may vary considerably based on the purpose of the drone operation.[118] There is strong evidence that public support for drones is directly linked to the level of perceived public benefit of the use-case in question.[119] Studies have found that the public tends to be more accepting of potential negative impacts of drones in the context of use-cases that are seen to provide higher societal value, such as drones used for scientific research, emergency relief, or search and rescue.[120] Yet, the current drone regulatory framework based on the aviation safety problematisation of drones does not acknowledge or take into account the trade-offs that communities are required to make in the face of drones in their skies.

In essence, the dominant problematisation of the drone as an aviation safety risk leaves the equation of the delivery of hot coffees or donuts with that of life-saving medicine (and their respective impacts on communities, environment, public health, and amenity) unproblematic.[121] More than that, the exemption-based framework contained in Part 101 CASR effectively privileges commercial operations over other, more public interest-driven drone operations, such as drone use by emergency services. Applications to CASA for exemptions from the standard operating conditions require prior notice and details of planned operations.[122] Commercial operators, such as the food delivery drone company Wing, are more likely to be able to provide clear temporal, geographical, and other parameters for planned operations than, for example, police or fire and rescue services whose operations are inherently unpredictable. In effect, Wing is afforded more far-reaching exemptions from standard operating conditions (such as the prohibition of overflight of people and populous areas or the requirement to keep operations within visual line of sight) than state and territory police forces.[123]

[118]Note that s9A(3a) *Civil Aviation Act 1988* (Cth) provides that CASA must, in developing aviation safety standards, consider the economic and cost impact on individuals, businesses and the community of the standards.
[119]See Aydin (2019).
[120]See, eg, Kellermann and Fischer (2020); Klauser and Pedrozo (2017); Boucher (2016).
[121]On the need to differentiate between drone use-cases of necessity from those of convenience, see UWA Minderoo Tech & Policy Lab (2022), p. 2.
[122]See Civil Aviation Safety Authority (2022c).
[123]See Civil Aviation Safety Authority, *Remotely Piloted Aircraft Operation over Approved Area of Canberra (Wing Aviation) Instrument 2023* (CASA EX78/23, 31 July 2023); Western Australia Police Force (2018), p. 3; Chloe Chomicki, 'Queensland

Safety first: discursive effects of the drone problematisation

The problematisation of the drone as an aviation safety risk has consequences beyond the scope of the regulations that have been created around it. Bacchi's WPR approach allows to uncover another important layer to the dominant problem representation: its discursive effects, or how the problematisation limits what can be said about drones.[124] In the Foucauldian tradition, discourses are understood as 'socially produced forms of knowledge'[125] that 'set limits upon what is possible to say or think about the object/s they create'.[126] Put differently, 'a discourse is a set of sanctioned statements which have some institutionalised force, which means that they have a profound influence on the way that individuals act and think'.[127] In this way, dominant discourses close off any attempts to challenge or deconstruct the preferred narrative. In short, the way drones have been problematised in the law fundamentally shapes how public institutions and society will engage with them, by extending the silences identified within existing regulations into the wider regulatory, policy, and public discourse.

The discursive power of the problematisation of the drone as an aviation safety risk stems from both its form and content. The heightened capacity of problematisations originating in legislation to assume dominance and therefore impact the public discourse has been established above.[128] In terms of content, safety is an emotive issue, which readily attracts high levels of public attention.[129] Public concern about the safety of aviation more generally, including drone operations, is understandable considering the very real harm that they can cause, and it has been proven that public acceptance of drones is linked to the perception of their safety.[130] In that context, the maturity of the aviation safety regulatory framework[131] and its high safety track record[132] instil confidence in its ability to address potential risks posed by drones effectively – and comprehensively. In effect, public attention and concern are diverted from other interests and potential harms. Granted, if the public is concerned about physical safety, drones' impact on other goods, such as privacy or the ability to enjoy the outdoors without significant noise or visual pollution, may seem of secondary importance. Yet, regulation should be able to mediate more than one set of interests. The singular focus of Australia's drone laws suggests the opposite.

Crucially, the problematisation of the drone as an aviation safety risk that is to be managed (and, hence, is inherently manageable) limits the regulatory drone discourse to questions around restrictions, safeguard mechanisms and redundancies. The key question is: *How do we ensure drones are as safe as possible?* This question assumes and leaves unproblematic the drone industry's general ambition to integrate drones into our skies. The resignation to the inevitability of increasing drone operations and the need to

Police Service unveils drones, but military-grade tech comes with limits', *ABC North Qld*, <https://www.abc.net.au/news/2022-02-21/drones-announced-for-north-queensland-police/100848208>, 21 February 2022.

[124]Bacchi (2009), p. 35.

[125]Bacchi (2009), p. 35.

[126]Bacchi (2009), p. 275.

[127]Strega (2015), p. 136.

[128]See 'Legislation as the object of WPR analysis'.

[129]See Bartsch (2018), p. 695.

[130]See Tarr et al (2021), p. 168; Clothier et al (2015), p. 1168.

[131]Aviation has been described as the most extensive and strictly regulated human activity. See, Bartsch (2018), p. 86.

[132]The rate of aviation related accidents has seen a 520-fold reduction over the existence of civil aviation law. See, Bartsch (2018), p. 696.

accommodate for them is a powerful discursive effect of the problematisation and is made explicit by CASA in its drone regulatory vision document: 'The roadmap outlines our expectation that RPAS will have expansive access to lower-level airspace by 2026 […]'.[133] The adherence to the reactive rationale underpinning statements such as this one inhibits discourses that aim to 'zoom out' from technical and operational issues. It thwarts engagement with bigger-picture questions about the desirability and trade-offs of certain drone operations and the collective impact of ever-increasing numbers of drones in the sky. By relying on a logic of general permission with selected restrictions, the problematisation of the drone as an aviation safety risk precludes the fundamental question: *Do we want drones in the sky and if so, under which circumstances?*

Repurposing the drone: the reproduction of the drone 'problem' in policy

Bacchi's WPR framework prompts a reflection on where the identified problem representation has been produced, disseminated, and defended. It is important to acknowledge the role the law and institutions play in facilitating the emergence of narratives, discourses and, in turn, realities. The law does not just react to emerging technologies – it produces narratives that will be captured and repurposed by those seeking to usher in those technologies. As Julie E. Cohen observes, the law is 'in on the ground floor'[134] in producing the changes in economic systems, power relations and institutional settings required by the rise of new technologies. The line of inquiry suggested through WPR question 6 helps to highlight 'the practices that install and authorize a particular problem representation'.[135] It speaks to the role of actors and practices outside of the legislative process in reaffirming the aviation safety risk problematisation. In the case of drones, there is a multitude of actors who are interested in maintaining the safety focus of regulatory activity: above all the federal Department of Infrastructure, Transport, Regional Development, Cities, and the Arts (the Department) as the agency tasked with providing policy direction on emerging aviation technologies, including drones, as well as a growing body of drone industry players, who have gained a standing as collaborators with the Department and CASA.[136] These actors have established the distinct power structures that have led to the entrenchment of the safety narrative as the main regulatory challenge of increasing drone operations, a desirable outcome for those with vested interest in the realisation of this vision.

Tracking the genesis and nature of the dominant framing of the drone in law provides a useful basis from which to consider more recent developments in Australia's national drone policy. Building on the safety problematisation they are designed to further a very clear policy objective: to enable, support and maximise the growth of the emerging aviation technologies sector. In May 2021, the Department released the *National Emerging Aviation Technologies (NEAT) Policy Statement*. This document presents the apex of the Federal Government's drone policy and sets out several whole-of-government

[133]Civil Aviation Safety Authority (2022a), p. 2.
[134]Cohen (2018).
[135]Bacchi and Goodwin (2016), p. 24.
[136]See the membership of the National Emerging Aviation Technologies Consultative Committee, which is the prime body the Department consults with in the development of drone policy: Department of Infrastructure, Transport, Communications, Regional Development, Communications and the Arts, 'Consultation', <https://www.drones.gov.au/policies-and-programs/consultation>.

initiatives designed to ensure the safe and efficient integration of new aviation technologies into Australian airspace. Importantly, it spells out that the lens through which drone regulation and policy is to be viewed is one of 'enabling drone, eVTOL [electrical vertical take-off and landing] and other emerging aviation technology operations and encouraging investment'.[137]

The NEAT Statement confirms the centrality of aviation safety considerations in the management of drone operations.[138] Moreover, it emphasises the reputation of CASA as a 'mature and progressive regulator'.[139] Read in the context of the Government's overall ambition to support the continued development of the drone sector and its evolving market, the reliance on a problematisation that centres around inherently manageable safety risks serves to instil the public and, importantly, industry with confidence.[140] Indeed, through the reproduction of the problematisation in policy its discursive effects are extended and replicated: a holistic appreciation of the implications of drones for society and environment alike is closed off and gives way to a policy approach based in risk-management and damage control.

Conclusion

This article has highlighted not only the possibility, but the necessity of interrogating the 'problems' that sit behind regulations. This approach makes room for fresh engagement with a given regulatory issue, such as drones, liberating it from the assumptions that have driven regulatory responses to date. Ultimately, deconstructing the dominant problematisation of regulatory objects through the law enables identification and assessment of alternative approaches to their regulation. This may yield better regulatory responses to the real and evolving challenges they present, rather than sticking with simplistic policy settings that carry forward existing omissions and shortcomings.

In conclusion, the identified problematisation of the drone as an aviation safety risk is understandable albeit inadequate. The current drone legal framework has its roots in civil aviation law that was conceived and developed in a context where the modern drone capabilities and range of uses were unimaginable. Given the general mandate and objective of aviation law, and the undeniable potential of drones to cause physical harm or damage, the initial focus on safety issues in regulation is plausible. But, as demonstrated, the natural limitations of aviation safety laws, and the institutional focus of CASA as the regulator, mean that a considerable range of other potential risks and harms of drone operations are currently un- or under-addressed.

Indeed, the analysis suggests that the context in which we find ourselves today – unprecedented levels of drones in the sky, a growing number of speculative and actual use cases across almost all sectors and areas of life – demands a critical examination of a range of pressing issues. These include, most clearly, the adequacy of existing

[137]Commonwealth Department of Infrastructure, Transport, Regional Development and Communications (2021), p. 9.
[138]See Commonwealth Department of Infrastructure, Transport, Regional Development and Communications (2021), p. 18.
[139]Commonwealth Department of Infrastructure, Transport, Regional Development and Communications (2021).
[140]See, eg, the Australian Association for Uncrewed Systems crediting 'CASA's forward leaning regulatory settings' as key driver of the growth of commercial drone operations in Australia. The Australian Association for Uncrewed Systems (2023), p. 4.

regulations, and regulators, to address the spectrum of issues beyond safety that drones present to the law and society alike. Here, a prime question is whether CASA's remit and resources require re-assessment and expansion beyond safety, or whether drones require bespoke or co-ordinated oversight agencies. More broadly, the analysis highlights the role of regulators, and the body of regulation itself, in facilitating a policy environment which has been created by and for a very limited set of invested actors and interests. These important issues call for further investigation, which goes beyond the scope of what can be addressed by this article. However, the present analysis strongly suggests that the dominant discourse, based in a narrowly conceived problematisation of the drone, provides a precarious basis from which to develop responsive regulation and policy. This is particularly true given the anticipated trajectory of the emerging aviation technologies sector: policy and regulatory developments suggest that drones are but a precursor to advanced air mobility, aka air taxis.[141] Against this backdrop, drones seem to open the door to a much more seismic shift in society than currently appreciated, adding a sense of urgency to the need to expand the problematisation of the drone to one of setting the purpose of our open skies.

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[141]See Civil Aviation Safety Authority (2022a).

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