

ABOVE US ONLY DRONES?



The safety and privacy risks of the coming expansion of drone use in the UK

Executive Summary

This report provides a critical review of the UK Government's efforts to accelerate the integration of a wider range and number of unmanned aerial vehicles (UAVs) – commonly known as drones – into UK airspace. Ministers argue that the expansion of domestic drone use presents exciting opportunities for business to create high-tech jobs and boost the UK's economy and have provided extensive political and financial support for this project. However, there is a striking lack of evidence and understanding of what the expansion in domestic use will mean in terms of the costs, risks and benefits for the economy and society at large. This means that the UK is largely taking a step into the unknown.

The use of drones within the UK is strictly controlled by the Civil Aviation Authority (CAA). Those wishing to fly drones beyond visual line of sight (BVLOS) of the operator must currently obtain specific permission from the CAA. Approved BVLOS flights take place in segregated airspace, which is only provided on a temporary basis. These restrictions are seen as a severe hindrance to the growth of the domestic use of drones. A variety of organisations and operators are pressing the Government to change the regulations to allow them to regularly fly drones BVLOS across the UK as this will enable long-range flights and a larger number of operations.

BVLOS drone use is currently restricted for safety reasons—drones can't reliably avoid other aircraft, while the UK's existing air traffic system lacks the means to facilitate such wider use. Technology is under development which manufacturers argue will enable such flights, but it is still largely untried and untested will need to be approved by regulators, if drones are to regularly fly BVLOS in non-segregated UK airspace.

The prospect of BVLOS drone flights becoming commonplace in the UK raises clear concerns about safety, privacy and security amongst the British public. In addition to the safety risks drones pose to airspace users and people on the ground, experts have highlighted potential security threats posed by drones, including to national infrastructure and involving organised crime. Drones also pose a particular threat to privacy as they will likely be used much more for surveillance purposes, gathering large amounts of data through sensors and cameras.

Given the scope of these developments, democratic scrutiny and parliamentary action is vital so that regulatory gaps can be filled, and appropriate processes and rules put in place to ensure the safe, responsible and ethical use of drones. This will require government agencies involved in the regulation of drones—including the CAA and Information Commissioner's Office—to be given appropriate resources and powers to protect citizens' privacy and safety. Concerns also need to be addressed through government consultations and public engagement to build trust and confidence in any significant expansion in drone use. At the very least, the Government should outline its vision for how drones will be responsibly integrated into UK communities over the next five to ten years and ensure that any rise in drone use focuses on meeting public needs.

1 The expansion of drone use in the UK

1.1 Actors and interests driving the expansion of domestic drone use

A number of public and private groups—including drone manufacturers, retailers, transport companies, and the defence industry—are pushing for current airspace rules to be changed to allow a much greater number and range of drones to fly in UK airspace. Proponents argue that drones can be used for a range of ‘dirty, dull and dangerous’ tasks such as freight and air transport, maritime and border surveillance, inspection and repair of infrastructure; environmental management; disaster response and management; and in hazardous situations.¹

The use of drones within the UK is carefully controlled by the Civil Aviation Authority (CAA). In the low risk ‘open’ category, drones weighing under 25kg are allowed to fly within the UK for recreation (or commercial purposes with a license) but must not fly above 400 feet or closer than 50 metres to people or buildings, and, most crucially, the drone must stay within sight of the operator. Those wishing to use drones which are larger, involve operations with a greater risk, or fly drones beyond visual line of sight (BVLOS) of the operator, must obtain specific permission from the CAA.² Approved BVLOS flights take place in segregated airspace, which is only provided on a temporary basis.³ These restrictions are seen as a severe hindrance to the growth of the domestic use of drones as operators want to be able to regularly conduct long-range BVLOS flights across the UK.

The Government is providing extensive political and financial support for the expansion of domestic drone use as part of its Airspace Modernisation Strategy. For example, in 2019 the Government announced the Future Flight Challenge, involving up to £125 million in funding for the aerospace sector to support the development of “electric planes, drones and autonomous aircraft by 2025”.⁴ Key areas of the Airspace Modernisation Strategy are being coordinated by the Airspace Change Organising Group (ACOG), a quango created by the Department for Transport (DFT) and the CAA.⁵

PricewaterhouseCoopers published a report in 2018 arguing that, if current rules were relaxed, over 76,000 drones could be in use in the UK by 2030, and that the drone industry could be worth £42bn to the UK economy.⁶ However, whilst these findings have been widely cited, their predictive value is uncertain. For example, a 2017 report conducted by IPOS MORI for the UK Government highlighted the serious difficulties involved in identifying data regarding the scale of drone production and use in both the EU and the UK.⁷ The DFT has

1 Carla-Leanne Washbourne, *Civilian Drones*, The Parliamentary Office of Science and Technology, <https://post.parliament.uk/research-briefings/post-pn-479/>, p.4

2 UK Civil Aviation Authority, *Unmanned Aircraft System Operations in UK Airspace - Guidance CAP 722*, p.46

3 UK Civil Aviation Authority Innovation Hub, *Beyond Visual Line of Sight in Non-Segregated Airspace Fundamental Principles & Terminology*, <https://publicapps.caa.co.uk/docs/33/CAP%201861%20-%20BVLOS%20Fundamentals%20v2.pdf>, p.4

4 UK Government, *New backing to transform the UK's future through the modern Industrial Strategy*, www.gov.uk, 6th December 2018 <https://www.gov.uk/government/news/new-backing-to-transform-the-uks-future-through-the-modern-industrial-strategy>

5 Our Future Skies, *Who are ACOG*, www.ourfutureskies.uk ; ADSAdvance, *UK airport and airspace development receives £5.5m support*, <https://www.adsadvance.co.uk/uk-airport-and-airspace-development-receives-5-5m-support.html>, 19th March 2021

6 PWC, *Skies without limits, Drones- taking the UK's economy to new heights*, www.pwc.co.uk, <https://www.pwc.co.uk/issues/intelligent-digital/the-impact-of-drones-on-the-uk-economy.html>, p.4

7 UK Government, *The UK Value Stream for Remotely Piloted Civil Aircraft Systems (RPAS)*, <https://www.gov.uk/government/publications/value-of-drones-to-the-uk-literature-review>, p.7



predicted that there will be 17,000 commercial drone operators in the UK by 2024.⁸ However, according to the CAA, as of March 2021 there were only 5,110.⁹

In 2019, DFT Minister Baroness De Vere was asked by the Chair of Parliament's Science and Technology Committee whether the Government had made an assessment of the current economic contribution of drones to the UK economy and 10 years hence. In response, De Vere stated that "they may well have done. I have not seen it at this moment in time".¹⁰ The Committee subsequently expressed concerns about this issue in their report *Commercial and Recreational Drone Use in the UK*, stating that "the Government does not appear to have made any independent assessment of the potential economic benefits and opportunities that arise from the growing drone industry."¹¹

The Committee's report also made several recommendations to address what it described as the "notable distrust towards drones among the general public". These included a call that the Government should, by Summer 2020, "produce a White Paper...that outlines the vision for how drones will be integrated into UK communities over the coming years," and launch "a public awareness campaign...that highlights the opportunities presented by drones and informs the public on the reality of the risks posed by drones".¹² The Government, however, rejected these proposals, arguing that existing initiatives and processes were sufficient.¹³ The Air Traffic Management and Unmanned Aircraft Bill, which

Above In July 2018, General Atomics flew a SkyGuardian drone into the UK to be put on display at the Fairford Air Show.
Credit General Atomics

⁸ Department for Transport, *Taking Flight: The Future of Drones in the UK: Government Response*, https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/937275/future-of-drones-in-uk-consultation-response-web.pdf, p.25

⁹ UK Civil Aviation Authority, *SUA operators*, <https://publicapps.caa.co.uk/docs/33/20210226RptUAVcurrent.pdf>

¹⁰ Science and Technology Committee, *Oral evidence: Commercial and recreational drones use in the UK*, 9th July 2019, <https://old.parliament.uk/business/committees/committees-a-z/commons-select/science-and-technology-committee/inquiries/parliament-2017/commercial-recreational-drone-uk-17-19/publications/>, pp.25-26

¹¹ House of Commons Science and Technology Committee, *Commercial and recreational drone use in the UK*, Twenty-Second Report of Session 2017-19, <https://publications.parliament.uk/pa/cm201719/cmselect/cmsstech/2021/2021.pdf>, p.3

¹² *Ibid.* p.4

¹³ UK Government, *Commercial and recreational drone use in the UK: Government Response the Committee's Twenty-Second Report of 2017-19*, <https://publications.parliament.uk/pa/cm5801/cmselect/cmsstech/270/27002.htm>

is, at the time of writing, going through Parliament, has been criticised by MPs and Peers for not properly addressing the dangers involved in an expansion in BVLOS drone use.¹⁴ Though other states are grappling with how to create regulatory processes to enable UAVs to safely fly BVLOS in domestic airspace, the UK Government's desire to be a leader in this field is driving it to accelerate the opening up of UK airspace to a greater number and type of drones.¹⁵

While the British public may support drones being used in limited ways, for example, to provide emergency and healthcare services, there is noticeably less enthusiasm for the recreational and commercial use of drones.¹⁶ To overcome this, the 'innovation foundation' NESTA has argued that the Government needs to prove the benefits of drones to the public by focusing on uses they would feel comfortable with, highlighting the benefits drones can provide to the public sector, so that wider, currently "contentious" uses—primarily involving business—could gain acceptance.¹⁷ Recently, the extraordinary circumstances arising as a result of the Covid-19 pandemic has seen police, security and other government agencies around the world increasing their use of drones domestically. In the UK, police were granted an exemption to existing rules by the CAA so they could enforce the lockdown using drones. The CAA also approved the use of BVLOS drones to deliver personal protective equipment to the Isle of Wight.¹⁸ This emergency has thus provided an opportunity for authorities to experiment with a wider range of uses for drones, assess their utility—and public responses—in addition to providing further funding to industry for drone technology development, including for projects focused on delivering medical supplies.¹⁹

1.2 The technical and regulatory challenges posed by flying drones BVLOS in the UK

To facilitate the expansion in drone use, the Government's intention appears to be to *accommodate* drones into domestic airspace, before facilitating their *integration* into UK airspace. According to the CAA, BVLOS use is currently restricted due to safety reasons: drones are unable to avoid other aircraft, while our current air traffic system lacks the means to facilitate this wider use.²⁰ If drones are to safely fly BVLOS, firstly they will need to be equipped with what is known as a 'Detect and Avoid' (DAA) capability – in short, an electronic proximity indicator. Although DAA technology is being

14 UK Parliament, Hansard, *Air Traffic Management and Unmanned Aircraft Bill [Lords]*, Volume 688: 2nd February 2021, [https://hansard.parliament.uk/Commons/2021-02-02/debates/25C17710-2C36-4655-8B47-A8BBD1BD563B/AirTrafficManagementAndUnmannedAircraftBill\(Lords\)](https://hansard.parliament.uk/Commons/2021-02-02/debates/25C17710-2C36-4655-8B47-A8BBD1BD563B/AirTrafficManagementAndUnmannedAircraftBill(Lords)); UK Parliament, Hansard, *Air Traffic Management and Unmanned Aircraft Bill [HL]*, Volume 801: 27th January 2020, [https://hansard.parliament.uk/lords/2020-01-27/debates/58CC534F-9010-4D45-A59E-A5178A39C955/AirTrafficManagementAndUnmannedAircraftBill\(HL\)](https://hansard.parliament.uk/lords/2020-01-27/debates/58CC534F-9010-4D45-A59E-A5178A39C955/AirTrafficManagementAndUnmannedAircraftBill(HL))

15 Carla-Leanne Washbourne, *Civilian Drones*, The Parliamentary Office of Science and Technology, <https://post.parliament.uk/research-briefings/post-pn-479/>, p.2

16 Science and Technology Committee, *Oral evidence: Commercial and recreational drones use in the UK*, 9th July 2019, <https://old.parliament.uk/business/committees/committees-a-z/commons-select/science-and-technology-committee/inquiries/parliament-2017/commercial-recreational-drone-uk-17-19/publications/>, p.26

17 Science and Technology Committee, *Oral evidence: Commercial and recreational drones use in the UK*, 26th June 2019, <https://old.parliament.uk/business/committees/committees-a-z/commons-select/science-and-technology-committee/inquiries/parliament-2017/commercial-recreational-drone-uk-17-19/publications/>, p.40

18 Graeme Paton, *Coronavirus: Police with emergency powers will use drones to spot crowds*, <https://www.thetimes.co.uk/article/coronavirus-police-with-emergency-powers-will-use-drones-to-spot-crowds-wmmvdklz>, 15th April 2020; *UAV lands on the Isle of Wight in historic drone trial*, <https://www.islandecho.co.uk/uav-lands-on-the-isle-of-wight-in-historic-drone-trial/>, 9th May 2020

19 UK Government, *Drones to fight fires and deliver COVID-19 supplies are first to receive share of over £33 million government funding*, <https://www.gov.uk>, 9th November 2020, <https://www.gov.uk/government/news/drones-to-fight-fires-and-deliver-covid-19-supplies-are-first-to-receive-share-of-over-33-million-government-funding>

20 Science and Technology Committee (Commons), *Commercial and recreational drone use in the UK inquiry – publications, Written evidence submitted by the UK Civil Aviation Authority*, 21st May 2019, <https://old.parliament.uk/business/committees/committees-a-z/commons-select/science-and-technology-committee/inquiries/parliament-2017/commercial-recreational-drone-uk-17-19/publications/>, p.4

developed, it is largely untried and untested. Other technology identified as being needed includes: ground-based air traffic control infrastructure; electronic identification and conspicuity equipment; as well as overall airspace traffic management. All of this is currently under development and will need to be approved by regulators, if drones are to regularly fly BVLOS in non-segregated UK airspace.²¹

While the CAA's regulatory role includes a responsibility to ensure the safety of airspace users and the public, it also has a duty to implement government policy. This means that the CAA is having to both regulate and promote BVLOS drone use, raising concerns that this creates a conflict of interest. It appears that the CAA is under pressure to speed up the integration of BVLOS drone use from those who argue that the UK is behind the curve in this area compared to other countries.²² As a result, the CAA is encouraging trial projects to allow drones to fly BVLOS (although in temporarily segregated airspace) and supporting the development of DAA technology. This includes through the CAA's 'regulatory sandbox', which provides guidance and support for organisations so they can "unlock" their proposed BVLOS operations in unsegregated airspace, and the Drone Pathfinder Programme.²³ In addition, a number of BVLOS test areas have been established in the UK, including the National BVLOS Experimentation Corridor based at Cranfield University.²⁴

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According to the British Airline Pilots Association (BALPA), allowing BVLOS drone flights in non-segregated airspace will require a fully interoperable airspace system that works across different airspace users given the range of aircraft types.²⁵ DAA capabilities for large drones also tend to be sizable and expensive and may not be scalable to smaller drones.²⁶ NATS, the UK's air traffic control service, has informed the CAA that it will need to increase "the surveillance of all airspace users, including drones and general aviation", for example by using electronic devices and infrastructure, if drones are to regularly fly BVLOS. For NATS, such measures are necessary to develop an airspace environment where all air traffic, manned and unmanned, can be seen, so that each individual aircraft is identifiable with their headings known, and all traffic is accommodated safely and efficiently.²⁷ In order to help solve such safety-related issues, the interaction between traditional air traffic management systems and systems being developed for drones (known as unmanned traffic management, or UTM) are being explored.²⁸

21 UK Civil Aviation Authority, Innovation Hub, *Detect & Avoid Ecosystem For BVLOS in Non-Segregated Airspace*, <https://publicapps.caa.co.uk/docs/33/CAP%201861a%20DAA%20Annex%20to%20BVLOS%20Fundamentals.pdf>, p.3

22 Science and Technology Committee, *Oral evidence: Commercial and recreational drones use in the UK*, 26th June 2019, <https://old.parliament.uk/business/committees/committees-a-z/commons-select/science-and-technology-committee/inquiries/parliament-2017/commercial-recreational-drone-uk-17-19/publications/>

23 UK Civil Aviation Authority, *Beyond Visual Line of Sight (BVLOS) operations of unmanned aircraft systems (UAS) in unsegregated airspace*, https://publicapps.caa.co.uk/docs/33/CAP1827_sandbox_brief_v2.pdf; UK Government, *Connected Places Catapult*, <https://cp.catapult.org.uk/pathfinder/>

24 Science and Technology Committee, *Oral evidence: Commercial and recreational drones use in the UK*, 26th June 2019, <https://old.parliament.uk/business/committees/committees-a-z/commons-select/science-and-technology-committee/inquiries/parliament-2017/commercial-recreational-drone-uk-17-19/publications/>, p.26; National BVLOS Experimentation Centre, <http://uknbec.com/>

25 Science and Technology Committee (Commons), *Commercial and recreational drone use in the UK inquiry - publications, Written evidence submitted by BALPA*, 21st May 2019, <https://old.parliament.uk/business/committees/committees-a-z/commons-select/science-and-technology-committee/inquiries/parliament-2017/commercial-recreational-drone-uk-17-19/publications/>, p.3

26 Carla-Leanne Washbourne, *Civilian Drones*, The Parliamentary Office of Science and Technology, <https://post.parliament.uk/research-briefings/post-pn-479/>, p.3

27 Science and Technology Committee (Commons), *Commercial and recreational drone use in the UK inquiry - publications, Written evidence submitted by NATS*, 21st May 2019, <https://old.parliament.uk/business/committees/committees-a-z/commons-select/science-and-technology-committee/inquiries/parliament-2017/commercial-recreational-drone-uk-17-19/publications/>, p.2

28 Science and Technology Committee, *Oral evidence: Commercial and recreational drones use in the UK*, 9th July 2019, <https://old.parliament.uk/business/committees/committees-a-z/commons-select/science-and-technology-committee/inquiries/parliament-2017/commercial-recreational-drone-uk-17-19/publications/>, p.26; ADS, *Civil drones: the world of the future*, <https://www.adsgroup.org.uk/blog/aerospace/civil-drones-the-world-of-the-future/>



Above The UK's Maritime and Coastguard Agency (MCA) has been trialling Elbit System's Hermes 900 drone. **Credit** Elbit Systems

1.3 Drone operations involving UK Government agencies

Military

The first of the UK's next generation armed drone, named Protector, will be delivered to the MOD in the summer of 2021, although testing and evaluation of the aircraft will take place in the US. It is set to enter service with the RAF in mid-2024. A prototype of Protector is set to be demonstrated by its manufacturer, General Atomics, in the UK in July 2021. Protector has been built to international airworthiness standards because the MOD's overall goal is for it to be integrated into UK and international airspace so that segregation is unnecessary. In order to allow Protector to be flown safely alongside other aircraft, the MOD has proposed that the CAA make changes to a zone of airspace around the drone's home base at RAF Waddington in Lincolnshire.²⁹

Maritime and Coastguard Agency

The Maritime and Coastguard Agency (MCA) is responsible for operating a 'pan-government' aerial surveillance programme. The MCA has used drones in the recent past and is studying the future use of drones for air sea rescue purposes. One of the aims of the MCA's drone trials is to "move public perception of drones from negative to positive by demonstrating their use in a life-saving application". If the routine use of drones by the MCA is to go ahead, the current safety and regulatory restrictions which prevent drones from flying in airspace shared with manned aircraft will need to be changed.³⁰

Police

Whilst the current police use of drones is restricted to small, quad-copter type systems, British police forces are trialling the use of much larger, military-grade drones that can stay airborne for much greater periods of time. Based on a comprehensive Freedom of Information survey of the police's current use of

²⁹ Drone Wars UK, *Protector briefing*, <https://dronewars.net>

³⁰ Peter Burt, *Crossing a Line: How the use of drones to secure borders threatens everyone's rights*, <https://dronewars.net/wp-content/uploads/2020/12/DW-Crossing-a-Line-WEB.pdf>, pp.28-29

drones, UK Drone Watch found that: i) at least 40 UK police forces presently use drones, with only two regional police forces saying they did not own or operate drones ii) there are currently at least 288 drones operated by UK police forces around the UK iii) in the first six months of 2020 there were more than 5,500 overt uses of drones by the police within the UK iv) drones have been used by several police forces to monitor political protests in England.³¹

2 Concerns with the expansion of domestic drone use in the UK

Public, civil society and expert concerns about drones being used in the UK focus on safety, privacy and security. For example, a poll UK Drone Watch conducted earlier this year of 2,000 adults regarding proposals to open UK skies to drones that fly 'beyond visual line of sight' found that:

- 51% were worried about noise and intrusion
- 60% said they were worried about the privacy and civil liberties implications
- 67% said they were worried about safety implications
- 70% agreed that if such drones were allowed to be flown in the UK, they should be flown in segregated airspace away from other aircraft.³²

Another key problem in relation to the societal impact of the planned expansion of drone use is the lack of available information. As the CAA puts it, "the limited data about drone ownership and use restricts the level of analysis that is possible both in assessing risk and gauging the success of the industry."³³

2.1 Safety, security and the environment

The prospect of rapid and unmanaged growth in domestic BVLOS drone use, a lack of adequate public consultation, and unproven regulatory processes, raises real concerns that UK airspace will become less safe and secure. Drones pose a risk of collision with other air users, with helicopters known to be particularly vulnerable.³⁴ Official figures from the UK's Airprox Board show that near misses between manned aircraft and drones have significantly risen in recent years and this has led to concerns that a fatal incident is inevitable as drone use increases.³⁵ Although it difficult to forecast exactly what happens when a drone hits another aircraft, a collision between a large drone and a passenger aircraft could be catastrophic. As well as a risk to other air users, the increased use of drones poses a risk to people and property on the ground through crashes and emergency landings.

While military forces have flown large drones BVLOS for more than twenty years, there are regular crashes – around two per month on average over the past decade. Causes of such crashes include the loss of the constant communication

31 Chris Cole with Jonathan Cole, *Benchmarking police use of drones in the UK*, <https://dronewars.net>, 2nd November 2020; Vikram Dodd, *Drones used by police to monitor political protests in England*, www.theguardian.com, 14th February 2021

32 UK Drone Watch, *Public opinion polling data: Drones Survey*, January 2021, www.ukdronewatch.net

33 Science and Technology Committee (Commons), *Commercial and recreational drone use in the UK inquiry - publications, Written evidence submitted by the UK Civil Aviation Authority*, 21st May 2019, <https://old.parliament.uk/business/committees/committees-a-z/commons-select/science-and-technology-committee/inquiries/parliament-2017/commercial-recreational-drone-uk-17-19/publications/>, p.6

34 Andrew Haylen, *Civilian Drones Briefing Paper*, House of Commons Library, <https://commonslibrary.parliament.uk/research-briefings/cbp-7734/>, p.22-23 ; House of Commons Science and Technology Committee, *Commercial and recreational drone use in the UK, Twenty-Second Report of Session 2017-19*, <https://publications.parliament.uk/pa/cm201719/cmselect/cmsstech/2021/202102.htm>, pp.30-31

35 House of Commons Science and Technology Committee, *Commercial and recreational drone use in the UK, Twenty-Second Report of Session 2017-19*, <https://publications.parliament.uk/pa/cm201719/cmselect/cmsstech/2021/202102.htm>, p.8

and control links which they rely on; mechanical and electrical failures; poor maintenance; and pilot error.³⁶ The prospect of growing numbers of light (e.g. 25 kg to 150 kg) and large drones (e.g. over 150 kg) flying in domestic airspace – whether operated by government agencies, business or industry – clearly has significant safety implications.

To address safety concerns that have arisen over the past few years in regard to the use of small drones, including the incursions at Gatwick and Heathrow airports in 2018, NATS and the CAA operate the DroneSafe app, whilst the CAA have published a Drone Code to help drone users “always fly safely and legally”.³⁷ However, the proposed expansion of BVLOS drone use in the UK will need to take into account a greater range of risks and uncertainties. In addition to safety concerns for airspace users and people on the ground, experts have highlighted other potential threats posed by drones, including to national infrastructure and involving organised crime.³⁸ Moreover, it is possible that drones could be hacked and taken over for malicious purposes, including through their “improvised weaponization”.³⁹ A substantial increase in drone usage would also have environmental impacts, including noise and visual pollution.⁴⁰

If drones are given unfettered access to UK airspace, this will likely have a significant negative impact on privacy within the UK

2.2 Privacy, data protection and ethical issues

One of the main benefit of drones lies in their ability to stay in the air far longer than helicopters or other aircraft, and to do so more cheaply, allowing them to be used more pervasively. Drones also significantly increase the domestic surveillance capacity of operators, such as the police, security services and private security companies as they are able to quickly gather large amounts of data through electronic sensors and cameras. However, if drones are given unfettered access to UK airspace, this will likely have a significant negative impact on privacy within the UK. The use of CCTV, both in public and private spaces, has mushroomed in the UK over recent decades, and it is reasonable to expect that private companies, police forces and government agencies will use drones to further increase their surveillance and data gathering capabilities.

Drone lobby groups such as the Association of Remotely Piloted Aircraft Systems-UK have noted that the ability of drones to capture images and data “are the fuel to new data-driven services” providing the raw materials for “new services based on data analysis.”⁴¹ For example, the UK’s vast private security industry, which monitors business and commercial premises, are likely to use drones for long-term surveillance operations on cost grounds, which could enable them to

36 Drone Wars UK, *Accidents Will Happen*, <https://dronewars.net>

37 UK Civil Aviation Authority, *Drone Safe*, <https://dronesafe.uk>; Civil Aviation Authority, *Drone Code*, <https://register-drones.caa.co.uk/drone-code>; Gatwick Airport: Drones ground flights, BBC News, 20 December 2018 <https://www.bbc.co.uk/news/uk-england-sussex-46623754>

38 Science and Technology Committee (Commons), Commercial and recreational drone use in the UK inquiry – publications, Written evidence submitted by the UK Civil Aviation Authority, *Written evidence submitted by ARPAS-UK*, 21st May 2019, <https://old.parliament.uk/business/committees/committees-a-z/commons-select/science-and-technology-committee/inquiries/parliament-2017/commercial-recreational-drone-uk-17-19/publications/>, p.1

39 Science and Technology Committee (Commons), Commercial and recreational drone use in the UK inquiry – publications, Written evidence submitted by the UK Civil Aviation Authority, *Written evidence submitted by Dr Stephen Wright*, 6th June 2019, <https://old.parliament.uk/business/committees/committees-a-z/commons-select/science-and-technology-committee/inquiries/parliament-2017/commercial-recreational-drone-uk-17-19/publications/>, p1

40 Chris Middleton, How can UK policy safely exploit the autonomous aviation market?, <https://diginomica.com>, 19th December 2019 <https://diginomica.com/how-can-uk-policy-safely-exploit-autonomous-aviation-market>; Science and Technology Committee, *Oral evidence: Commercial and recreational drones use in the UK*, 9th July 2019, <https://old.parliament.uk/business/committees/committees-a-z/commons-select/science-and-technology-committee/inquiries/parliament-2017/commercial-recreational-drone-uk-17-19/publications/>, p. 40

41 Science and Technology Committee (Commons), Commercial and recreational drone use in the UK inquiry – publications, *Written evidence submitted by the UK Civil Aviation Authority*, Written evidence submitted by ARPAS-UK, 21st May 2019, <https://old.parliament.uk/business/committees/committees-a-z/commons-select/science-and-technology-committee/inquiries/parliament-2017/commercial-recreational-drone-uk-17-19/publications/>, p.4



Left The Government has been advised to highlight benefits of drones to counter negative public perception. In October 2020, a start-up was given permission to trial the use of drones to transport blood samples for the NHS. **Credit** PA

acquire huge amounts of data via video and other sensors aboard their drones. Beyond the use of drones for security purposes, companies are also likely to use drones to increase the data they hold on potential customers in order to better target them with marketing.

As the authors of a report by the Surveillance Studies Centre at Queen's University in Canada note, drones provide a different level of capability for operators by introducing new means of visualising data. This is because drones can collect a range of data types on a persistent (or semi-persistent) basis from multiple aerial vantage points. Modern drones can also carry the full range of available advanced surveillance technologies. In addition, unlike "fixed and visible" CCTV cameras which warn the public of their presence, drones "can operate high above those caught in the camera", who will neither see nor hear the aircraft.⁴²

The UK Government's Surveillance Camera Commissioner, Tony Porter, has expressed alarm at "the way overt surveillance from CCTV, body cameras and drones could become even more invasive", and "admitted that regulators and the government were struggling to keep up with the pace of technological change".⁴³ Similarly, a 2018 NESTA study of public attitudes to drones found that "safety, privacy and accountability concerns dominate" discussion of the issue.⁴⁴ The Information Commissioner's Office (ICO) is the body responsible for safeguarding the public's data rights and have been involved in the debate on drone use. The ICO have argued that it is important to recognise the ethical and privacy risks that drones pose because they can capture vast amounts of personal data without individuals' "informed consent".⁴⁵

42 Ciara Bracken-Roche, David Lyon, Mark James, Mansour Adam, Molnar Alana, Saulnier Scott Thompson, *Surveillance Drones: Privacy Implications of the Spread of Unmanned Aerial Vehicles (UAVs) in Canada*, Surveillance Studies Centre, Queen's University, https://www.sscqueens.org/sites/sscqueens.org/files/Surveillance_Drones_Report.pdf, pp.4-5

43 Matthew Weaver, *UK public faces mass invasion of privacy as big data and surveillance merge*, www.theguardian.com, 14th March 2017 <https://www.theguardian.com/uk-news/2017/mar/14/public-faces-mass-invasion-of-privacy-as-big-data-and-surveillance-merge>

44 Richard Duffy, *Understanding the public perception of drones*, Nesta, www.nesta.org.uk, 24th May 2018, <https://www.nesta.org.uk/blog/public-perception-of-drones/>

45 Science and Technology Committee (Commons), *Commercial and recreational drone use in the UK inquiry - publications, Written evidence submitted by the UK Civil Aviation Authority, Written evidence submitted by Steve Wood, Deputy Commissioner (Executive Director - Policy), Information Commissioner's Office*, 11th June 2019, <https://old.parliament.uk/business/committees/committees-a-z/commons-select/science-and-technology-committee/inquiries/parliament-2017/commercial-recreational-drone-uk-17-19/publications/>, p.1

The capturing of data and imagery by drones is subject to existing legislation covering CCTV surveillance and privacy, such as the Data Protection Act (1998). Former Policing Minister Damian Green stated in 2013 that, “covert use [of drones] by a public authority likely to obtain private information...would be subject to authorisation under the Regulation of Investigatory Powers Act [RIPA] 2000.” However, a number of lawyers, researchers and campaigners have criticised RIPA for its lack of safeguards concerning surveillance.⁴⁶ Several other laws exist that are intended to protect citizen’s privacy in the UK and which are relevant to the expansion of domestic drone use. The DFT have provided an overview of these laws, which include: aviation rules outlined in the Airspace Navigation Order (ANO) 2016; trespass laws concerning flights over the property of another person; the Countryside and Rights of Way Act 2000.⁴⁷

However, the fact that drones are becoming smarter, with advances in artificial intelligence likely to assist these aircraft in carrying out surveillance and data gathering operations, raises the question of whether existing legislation can effectively cover emerging capabilities (such as facial recognition technology) and uses. Moreover, in 2014 the European Commission published a detailed study on the “privacy, data protection and ethical risks in civil Remotely Piloted Aircraft Systems operations”. In terms of UK-specific findings, the report noted that “Britain’s legislation relating to surveillance is patchy, and in some areas, there is no protection against infringements committed by public authorities as well as by private organisations.”⁴⁸ Researchers have also highlighted how “marginalised” groups may be disproportionately targeted by expanded surveillance capabilities, such as those involving drones.⁴⁹

Conclusion

The coming expansion in domestic drone operations, particularly the introduction of regular BVLOS drone flights, will likely have far-reaching impacts on the lives of British people. Given the nature of these changes, democratic scrutiny and parliamentary debate is vital so that regulatory gaps can be filled, and appropriate processes and rules put in place to ensure the safe, responsible and ethical use of drones. At present, the lack of information and public debate about the changes is deepening public mistrust. To address this, the Government needs to firstly recognise that by encouraging a rapid expansion in domestic drone use it is taking the UK into a largely unknown situation. To build public confidence, reduce risks and ensure data protection, the Government must provide much greater information and facilitate public engagement concerning the operation, costs and risks of opening UK skies to BVLOS drones.

46 Chris Jones, *Drones: the UK debate and its implications for the EU*, EU Law Analysis, 28th May 2014, <http://eulawanalysis.blogspot.com>

47 Science and Technology Committee (Commons), Commercial and recreational drone use in the UK inquiry - publications, *Written evidence submitted by Department for Transport*, 21st May 2019, <https://old.parliament.uk/business/committees/committees-a-z/commons-select/science-and-technology-committee/inquiries/parliament-2017/commercial-recreational-drone-uk-17-19/publications/>, p.2

48 Rachel L. Finn and David Wright, Laura Jacques and Paul De Hert, *Study on privacy, data protection and ethical risks in civil Remotely Piloted Aircraft Systems operations Final Report*, European Commission, <https://www.politico.eu/wp-content/uploads/2019/08/Study-on-privacy-data-protection-and-ethical-risks-in-civil-RPAS-operations-1.pdf>, p.292

49 Rachel L. Finn and David Wright, *Unmanned aircraft systems: Surveillance, ethics and privacy in civil applications*, <https://www.dhi.ac.uk/san/waysofbeing/data/data-crone-finn-2012.pdf>, p.190



Recommendations

The following recommendations draw on ideas from a variety of experts and official bodies, and are intended to ensure that any expansion in drone use is done safely, preserving privacy, protecting the environment, and with transparent and accountable decision-making built in.

Above The MQ-9 SkyGuardian, which the UK is choosing to call 'Protector' is being built and tested in the US.
Credit Ministry of Defence

Safety and the environment

- The CAA must be encouraged and empowered by the Government to prioritise its regulatory responsibilities and ensure that BVLOS drones are only allowed to operate in the UK if they are safe to fly and flown safely.
- The Government should conduct and publish safety and environmental impact assessments of scenarios involving the expansion of drone use over the next five to ten years to ensure that growth is manageable and handled responsibly.
- Local government, city authorities and communities should be consulted by the Government on likely scenarios involving any expansion of drone use, as it affects their immediate environment, to minimise risk, noise and visual pollution.
- Drone manufacturers should be mandated to build in appropriate safety, environmental and privacy measures to their products.

Surveillance, privacy and ethical use

- The European Commission has made several useful proposals on how the risks to privacy posed by drones may be reduced, including: giving members of the public information about the activities being undertaken; minimising the amount of data that is collected; anonymising data that is collected; ensuring that the data is only used for the original purpose for which it was collected, eliminating or reducing the storage of personal data; and ensuring that data that is processed or stored is properly secured.⁵⁰

⁵⁰ Rachel L. Finn and David Wright, Laura Jacques and Paul De Hert, *Study on privacy, data protection and ethical risks in civil Remotely Piloted Aircraft Systems operations Final Report*, European Commission, <https://www.politico.eu/wp-content/uploads/2019/08/Study-on-privacy-data-protection-and-ethical-risks-in-civil-RPAS-operations-1.pdf>, p.12

- Drone operators in the UK should be instructed by Government to follow the Surveillance Camera Commissioner's code of practice, which recommends that such cameras should only be used if there is an immediate public need.⁵¹
- The use of drones for regular, blanket surveillance in the UK should be resisted. Parliamentarians need to propose laws to cover the additional surveillance capabilities of drones compared to existing CCTV, make sure that legislation differentiates between covert and overt uses of drone surveillance, and ensure that the law responds to emerging drone technology, for example, as artificial intelligence develops and provides new and more powerful capabilities.

Democracy, transparency and accountability

- Government agencies involved in the regulation of drones, including the CAA and ICO, need to be given appropriate resources and powers to ensure that the expansion in drone use in the UK prioritises safety, privacy and public accountability.
- Financial support provided by the UK Government to academia and industry to develop DAA and other drone technology must be made subject to parliamentary review so that its value can be assessed. In order to recoup the direct and indirect subsidies provided by the Government to business to create a market and infrastructure for domestic BVLOS drone use, the Government should appropriately tax those companies who will profit the most from opening up UK skies to greater drone use.
- The concerns of civil society and the public need to be addressed through government consultations and engagement to build trust and confidence in drone use, particularly involving business, the police and other state agencies. For example, the Government should outline its vision for how drones will be integrated into UK communities over the next five to ten years.

⁵¹ UK Government, *Surveillance camera code of practice: self assessment tool*, <https://www.gov.uk/government/publications/surveillance-camera-code-of-practice-self-assessment-tool>