Introduction

UK Drone Watch's mission is to ensure that the public and parliamentarians can participate in decision-making on the planned expansion in drone use in the UK. Our response to this consultation therefore focuses on developing regulation and legislation covering the opening of UK airspace to a wider range and greater number of unmanned aerial vehicles (UAVS), commonly known as drones. The first thing to note is that there is currently a striking lack of evidence and understanding concerning what the expansion in domestic drone use will mean for the UK in terms of the social and economic costs, risks, and benefits. What we do know is that the prospect of beyond visual line of sight (BVLOS) drone flights becoming commonplace in the UK raises clear concerns about safety, privacy, and security amongst the British public.

Given the significance of this issue, the priority for the Government must be to consult with the public on the fundamental question of whether any significant domestic expansion in drone use, particularly BVLOS, should occur. Thereafter, more specific questions on the scale and type of drone operations can be discussed, including as part of a process to identify and fill regulatory gaps to ensure the safe, responsible, and ethical use of drones. Our findings are based on evidence from prominent sources, including the Government's own previous inquiries, to provide a rounded review of the issues and identify which data should inform future decision-making on drones.

1. **Drone technology and democracy: getting the process right**

Whilst we welcome the opportunity provided by this consultation to discuss the issue of expanding domestic drone use, the approach it takes to this subject is flawed and inadequate. This is firstly because the consultation gives insufficient space and importance to the drone issue. Secondly, the consultation does not recognise the need for substantial public discussion concerning the desirability of any significant expansion in domestic drone use occurring prior to the initiation of legislative reform or regulatory innovation.

The significance of expanding domestic drone use has been highlighted by several eminent bodies. For example, a 2014 report by the EU Committee of the House of Lords found that drones "will revolutionise what the aviation industry can achieve and how it is regulated".[1] In 2018 NESTA produced a report entitled *Flying High: shaping the future of drones in UK cities*, which stated that "there are strong parallels between the introduction of cars and the introduction of drones - for good and for ill."[2] Similarly, in November 2021, the Regulatory Horizons Council produced a study entitled the *Regulation of Drones,* which stated that drones "promise to transform, and to disrupt, numerous industries".[3] It is therefore clear from such analyses that expanding domestic drone use is a major question for British society, requiring a corresponding level of attention from Government.

The DFT's consultation document states that "the regulatory review may conclude that substantive legislative reform is required" regarding new aviation technology. A legislative process is appropriate to the issue of expanding domestic drone use given its predictable societal impacts. Prior to this, however, the Government should commence a public discussion concerning the desirability of introducing this technology on any significantly greater scale, including whereby BVLOS flights become commonplace. As the aforementioned NESTA study found, whilst "there is growing alignment

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[1] House of Lords, European Union Committee (2014) Civilian use of drones in the EU, p.5
[2] NESTA (2018) Flying High: Shaping the future of drones in UK cities, July, p.10
[3] The Regulatory Horizons Council (2021) The Regulation of Drones, An exploratory study, November, p.4

between the key stakeholders - government, industry, regulators - on what the future of drones should look like in the UK...so far the general public has played only a small role".[4]

The Science and Technology Committee's 2019 parliamentary report *Commercial and recreational drones use in the UK* made several recommendations to address what it described as the "notable distrust towards drones among the general public". These included a call on the Government to, 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".[5] The Government, however, rejected these proposals, arguing that existing initiatives and processes were sufficient.[6] The Future of Flight review needs to avoid making the same mistake by facilitating public participation in decisions on expanding drone use. Without public confidence and consent, any plans to move in this direction will be much more difficult and lack legitimacy.

2. Who will benefit from the domestic drone revolution?

The scope of the Future of Flight consultation is based on the expectation that "unmanned aircraft will routinely fly beyond visual line of sight to open up new markets for delivery, surveying, data collection and search-and-rescue". The consultation also cites evidence that the value of the drone economy may be worth "up to £42 billion by 2030 with up to 76,000 drones operating in our skies".[7] However, whilst these PWC 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.[8] Moreover, the DFT has previously estimated that there will be 17,000 commercial drone operators in the UK by 2024.[9] According to the Civil Aviation Authority (CAA), as of March 2021 there were 5,110 commercial operators of small unmanned aircraft.[10] Whilst the number of drone operators has rapidly increased in recent years, if such growth is to continue, a number of technical, regulatory and political challenges will need to be overcome.[11]

It is also important to be clear about precisely who is set to benefit from an expansion in domestic drone use, and the danger that such change will widen inequality. There have been predictions that the UK would benefit from the drone economy providing significant numbers of jobs and that there will be cost and productivity gains across several sectors, including transport and logistics. However, a 2016 PWC report found that large numbers of job losses are also likely to occur globally as a result of a shift to drone use by industry.[12] Furthermore, the 2017 UK Government document *UK value stream for remotely piloted civil aircraft systems* found that most manufacturers of smaller, civil drones are based overseas and that "a strong RPAS manufacturing cluster has not emerged in the UK".[13] Many of the rewards from the UK moving to a greater reliance on drones are therefore likely to accrue to the foreign companies which make these aircraft.

[4] NESTA (2018) *Flying High: Shaping the future of drones in UK cities*, July, p.7
[5] House of Commons Science and Technology Committee (2019) *Commercial and recreational drone use in the UK*, Twenty-Second Report of Session 2017–19, https://publications.parliament.uk, p.4
[6] UK Government (2020) Commercial and recreational drone use in the UK: Government Response the Committee's Twenty-Second Report of 2017–19, https://publications.parliament.uk
[7] PWC (2018) *Skies without limits, Drones- taking the UK's economy to new heights*, www.pwc.co.uk, p.2
[8] UK Government (2017) *The UK Value Stream for Remotely Piloted Civil Aircraft Systems (RPAS)*, p.7
[9] Department for Transport (2019) *Taking Flight: The Future of Drones in the UK: Government Response*, p.25
[10] UK Civil Aviation Authority (2021) *SUA operators*, https://publicapps.caa.co.uk
[11] Richard Duffy (2018) *Mapping the UK drone industry*, www.nesta.org.uk, 6 September
[12] PWC (2016) *Clarity from above: global report on the commercial applications of drone technology*, www.pwc.pl, p.4
[13] UK Government (2017) *The UK Value Stream for Remotely Piloted Civil Aircraft Systems (RPAS)*, www.gov.uk, pp.3-4

The Government has provided significant funding to create the market and infrastructure for domestic drone use. NESTA reported in 2018 that "over 400 public grants…have been awarded by Innovate UK, the Research Councils and Horizon 2020 to develop drone or drone-related technologies."[14] The UK Government is therefore actively trying to make the domestic drone revolution happen. However, it is wrong for the taxpayer to shoulder the burden of creating a market and infrastructure for domestic drone use, especially without wider public debate on whether funds should be spent in this area.

The Future of Flight consultation also highlights the issue of the UK developing an Unmanned Traffic Management (UTM) system for domestic drones. The Horizons report rightly describes airspace as a "shared national resource".[15] It is imperative that the introduction of UTM does not lead to UK skies being privatised or given over to big tech companies. The danger of this happening has already been seen in Australia, where efforts to create a UTM for drones have seen companies involved wanting to own the system themselves.[16]

3. Expanding drone surveillance: the threat to privacy and human rights

The Future of Flight consultation document states that it is interested in views relating to "consideration of data and privacy requirements around information sharing in relation to new or novel aircraft". In addition to Government agencies, there are currently hundreds of companies using drones to provide various services—including data capture and surveillance. Any significant expansion in domestic drone use (particularly involving BVLOS flights) will very likely entail a corresponding increase in drones being used for surveillance by state agencies, commercial enterprises, and private actors. Given the deeply controversial nature of drone surveillance, the DFT should recognise the importance of the issue in its deliberations on drone regulation and legislation.

Qualitative improvements to, and quantitative increases in, drone surveillance and data gathering have clear implications for privacy and data rights. The legislation covering a surveillance operation depends on whether the operator is a public authority or private actor. In the former case, the Surveillance Camera Code of Practice applies to overt surveillance, whilst the Regulation of Investigatory Powers Act (RIPA) 2000 governs covert surveillance. However, lawyers, campaigners and parliamentarians have criticised RIPA for its lack of safeguards concerning surveillance—including how data is retained and used—and have proposed measures so that it can be clarified and strengthened.[17]

Our research has found that several UK police forces already use drones to monitor public events and protests.[18] One of the main issues with the growing use of surveillance technology in policing is that the public has virtually no knowledge of what this data is used for, how it is stored, and how this impacts on their right to privacy. Of 2,000 British people questioned in a recent poll by UK Drone Watch, 60% were worried about the effects of expanding drone use on their privacy and civil liberties.[19] Tight restrictions on drone surveillance are therefore required to prevent abuses of power. Moreover, transparency is essential if the public are to ever trust the use of drones by public authorities.

Elsewhere, the consultation document asks for "data or evidence about whether any of the proposals discussed in this consultation would positively or negatively impact on individuals with protected

[14] NESTA (2018) Flying High: Shaping the future of drones in UK cities, July, p.14
[15] The Regulatory Horizons Council (2021) The Regulation of Drones, An exploratory study, November, p.26
[16] Michael Richardson et al (2021) Privatising the sky: drone delivery promises comfort and speed, but at a cost to workers and communities, https://theconversation.com, 4 October
[17] Tim Street (2021) On the horizon: drone spies coming to UK skies, https://dronewars.net, 26 October
[18] Chris Cole with Jonathan Cole (2020) *Benchmarking police use of drones in the UK*, https://dronewars.net, 2 November; Vikram Dodd (2021) *Drones used by police to monitor political protests in England*, www.theguardian.com, 14 February
[19] UK Drone Watch (2021) *Public opinion polling data: Drones Survey*, January, www.ukdronewatch.net

characteristics (as defined in section 4 of the Equality Act 2010)?" New drone surveillance technologies and tools threaten to increase discrimination against women and ethnic minorities. For example, facial recognition technology—which could be built into police drones in future—has repeatedly been found to exacerbate racial bias, with research carried out in 2018 finding that some facial analysis algorithms misclassified black women nearly 35 percent of the time, while typically working best on middle-aged white men's faces.[20] It is therefore imperative that strong safeguards are placed on the use of surveillance drones to prevent people's rights being abused.

4. Prioritising safety, human 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. The 2018 NESTA report thus correctly states, regarding drones, that "Introducing cars into cities brought chaos. With this new transport technology, we must do better".[21] Notably, a poll we conducted earlier this year of 2,000 adults regarding proposals to open UK skies to drones that fly BVLOS found that 67% were worried about safety implications.[22]

Drones pose a risk of collision with other air users, with helicopters known to be particularly vulnerable. 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.[23] 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 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. 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 Detect and Avoid (DAA) technology.

Despite these initiatives, the Drone Delivery Group argue that the "deficiency of concrete progress" in developing drone safety to support growing commercial use has been caused by the Government having "no clear national strategy", leading to "significant frustration from industry".[24] The other side of this coin is that the drone industry is reluctant to fully take on the costs and risks involved in creating the infrastructure needed for drones to be integrated into UK airspace, wanting the British state to provide further subsidies instead. The British Airline Pilots Association has observed that introducing "safety features" to drones, that are "built and certified to recognised and accepted international standards", has been "strongly resisted by some within the drone industry as it will increase costs."[25]

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[20] Larry Hardesty (2018) Study finds gender and skin-type bias in commercial artificial-intelligence systems, 11 February, https://news.mit.edu; Kade Crockford (2020) How is Face Recognition Surveillance Technology Racist?, www.aclu.org, 16 June

[21] NESTA (2018) Flying High: Shaping the future of drones in UK cities, July, p.10

[22] UK Drone Watch (2021) *Public opinion polling data: Drones Survey*, January, www.ukdronewatch.net

[23] House of Commons Science and Technology Committee (2019) *Commercial and recreational drone use in the UK*, *Twenty-Second Report of Session 2017–19*, https://publications.parliament.uk, p.8

[24] Drone Delivery Group (2020) Commercialization of the UK Drone Industry, www.dronedeliverygroup.org, pp.2, 6

[25] House of Commons Science and Technology Committee (2019) Commercial and recreational drone use in the UK inquiry – publications, *Written evidence submitted by BALPA*, 21 May, https://old.parliament.uk, p.3

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. Moreover, it is possible that drones could be hacked and taken over for malicious purposes, including through their "improvised weaponization".[26] A substantial increase in drone usage would also have environmental impacts, including noise and visual pollution. In Australia, delivery trials by Google affiliate Wing in 2019 stopped after repeated noise complaints.[27] A poll we conducted earlier this year regarding proposals to open UK skies to drones that fly BVLOS found that 51% of respondents were worried about noise and intrusion.[28] Notably, the 2021 Horizon report highlights—with regards to drone deliveries—that "there may be a gap concerning noise regulation" in the UK.[29]

Drones are also being promoted in the UK as a green technology, with claims that they will cut emissions by reducing traffic. However, Australian academics highlight the fact that drones may have "hidden environmental costs", for example, by relying on mining for lithium batteries and because of the need to supply energy to infrastructure supporting the aircraft. Furthermore, the amount of packaging used on drone delivery items could increase waste and birds and their habitats may be threatened by such aircraft being heavily used.[30]

Conclusion

A significant expansion in domestic drone use, particularly involving regular BVLOS drone flights, will likely have far-reaching impacts on the lives of British people. A range of prominent groups have warned of the chaos and disruption the drone revolution could bring to our social and economic life if poorly managed. Concerns about drones from the public, civil society and experts focus on safety, privacy, and human security. Democratic scrutiny and parliamentary debate are therefore 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 in this area 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 wider drone use.

Recommendations

- The Government should carry out an independent assessment of the consequences of opening UK skies up to wider drone use, including the social, environmental, and economic impacts. This could be followed by the Government outlining proposals for how drones could be integrated into UK communities over the next five to ten years, including mitigation measures for any disadvantages identified.

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[26] Science and Technology Committee, Commons (2019) 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*, 6 June, https://old.parliament.uk, p.1

[27] Jackson Gothe-Snape (2019) *Google-affiliated drone delivery service found to be exceeding noise limits*, 11 September www.abc.net.au; Kate Christian and Craig Allen (2021) *'Territorial' ravens disrupt surge in Wing drone deliveries under Canberra's lockdown*, 21 September, https://www.abc.net.au

[28] UK Drone Watch (2021) *Public opinion polling data: Drones Survey*, January, www.ukdronewatch.net

[29] The Regulatory Horizons Council (2021) *The Regulation of Drones, An exploratory study*, November, p.14

[30] Michael Richardson et al (2021) *Privatising the sky: drone delivery promises comfort and speed, but at a cost to workers and communities*, https://theconversation.com, 4 October

- The Government, including the Department for Transport, should start a national conversation on potentially socially disruptive new technologies, such as drones, and the implications of regular BVLOS flights. The focus should be on establishing what the public really thinks and wants with regards to the future of drone technology. This should be done through an independent and trusted agency outside Government conducting interviews and workshops with the public, to allow balanced consideration of the benefits, costs, and risks of these aircraft. The findings should be published and form the basis of future Government policy on drones and other emerging technologies.

- Any significant transition to drone use by industry and Government needs to be just. Communities and livelihoods must be protected to prevent increases in inequality. Consultation with those affected by new drone technologies—including workers, unions, and local authorities—must be a priority to ensure they can shape their own future. Airspace is a shared national resource and needs to be managed communally. To prevent a monopoly developing, the Government should designate that Unmanned Traffic Management Systems are public utilities.

- A range of measures have been proposed by experts and campaigners to protect people's rights from drone surveillance. For example, consideration should be given to banning commercial intelligence gathering operations using drones. Authorisation for covert drone surveillance by, or on behalf of, Government bodies should only be given in extreme circumstances. Government authorities should be legally obliged to conduct Equalities Impact Assessments before conducting surveillance operations.

- In addition, risks to privacy posed by drones may be reduced by Government authorities (such as the police) being compelled to: give members of the public information about overt surveillance being undertaken; minimise the amount of data that is collected; anonymise data that is collected; ensure that the data is only used for the original purpose for which it was collected, eliminate or reduce the storage of personal data; and ensure that data that is processed or stored is properly secured.[31]

- Government agencies involved in the regulation of drone operations, including the CAA, Information Commissioner, Investigatory Powers Commissioner, and Surveillance Camera Commissioner, need to be given appropriate resources and powers to ensure that any expansion in drone use in the UK prioritises safety, privacy and public accountability. 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.

- 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. Drone operators should be legally required to ensure that their equipment is airworthy and does not exceed noise limits.

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[31] Rachel L. Finn and David Wright, Laura Jacques and Paul De Hert (2014) *Study on privacy, data protection and ethical risks in civil Remotely Piloted Aircraft Systems operations Final Report*, European Commission, www.politico.eu, p.12; Tim Street (2021) On the horizon: drone spies coming to UK skies, https://dronewars.net, 26 October