Briefing note: Police Drones

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OVERVIEW

- Drones are used by at least 40 of the UK's 48 police forces, and are deployed in a growing range of applications
- Drones are associated with benefits including the rapid provision of situational awareness, enabling access to dangerous and remote sites, reducing risks to officers, and offering cost-saving aerial support
- Challenges and barriers to police drone use include changes to regulation, internal and centralised resources, and restrictions around Beyond Visual Line Of Sight (BVLOS) flight
- Police forces also encounter and are responsible for enforcing reckless, negligent, criminal, and malicious drone misuse. They respond with both educational and legislative tools
- As drone technology advances, police are interested in developing and expanding their use cases.

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1. INTRODUCTION

Drones are aircraft without a pilot on board and which can be controlled remotely and/or fly with various levels of automation and autonomy. While inclusive of land, water and aerial craft, this briefing focuses on aerial platforms as these are most often used by UK police forces. Drones range in shape and size, from small hand-held devices to larger aircraft, and include both rotary and fixed wing platforms. While many drones carry cameras, they can also be outfitted with additional equipment, such as high-powered cameras, sensors (e.g. thermal imaging), lights and speakers. Praised as affordable tools enabling the rapid provision of situational awareness, drones are increasingly deployed as part of standard operational responses.

It is estimated that 'at least 40' of the UK's 48 police forces are 'using drones', and that 'at least 288 drones' are operated by police forces in the UK.[1] Drone use also continues to grow more widely across UK skies. In January 2023 the UK's aviation regulator, the Civil Aviation Authority (CAA), stated that it has 500,000 drone 'operators and flyers' registered under Drone and Model Aircraft registration, processes 7,000 operational authorisation applications per year, and that the total number of drone pilots and aircraft are already '80% larger than the General Aviation and commercial air sector added up'.[2]

Yet, while drones are associated with a growing number of applications, concerns remain around the risks posed by reckless, negligent, malicious and criminal drone use. From drone incursions at airports and near aircraft, drones transporting contraband into prisons, to drones outfitted with weaponry, drone misuse continues to capture global headlines. While drones are deployed as valuable policing tools, so too are UK police responsible for tackling and enforcing drone misuse and abuse.

This briefing is part of the *Diversifying Drones Stories* research project (ES/W001977/1) led by Dr Anna Jackman. Funded by the Economic and Social Research Council, the project engaged with diverse stakeholders to explore the use, perception, and impact of drones in changing UK airspace. This briefing draws on two focus groups involving 10 participants. The focus groups were held online on Microsoft Teams and participants included: police drone unit members (5), members of UK police forces (4), and individuals working with the police (1). The focus groups explored: operational uses and benefits of drones in policing, challenges and barriers to drone use, responding to drone misuse, and aspirations for police drone use in the future. This briefing is written for an emergency service audience. It is also accompanied by a longer form report, '*Police Drones: Uses, Challenges, Futures*'.[3]

2. CURRENT USES

Drones are in regular use by emergency services across the UK. UK police forces deploy drones in a growing range of routine, pre-planned and spontaneous operations, including:

- Aerial photography and videography
- Aerial searches (including missing persons)
- Anti-social behaviour response
- Body recoveries
- Burglaries in progress
- Command oversight (e.g. public order, sport events, protests, festivals),
- Crime scene monitoring and photography (e.g. flythrough of scenes / suspect routes)
- Covert operations
- Evidence gathering
- Fire incidents
- Firearms response
- Golden hour response
- Hazmat response
- Information and intelligence gathering
- Mapping / event and operation pre-planning
- Organised crime (e.g. county lines)
- Overt operations
- Rural crime
- Road traffic collisions
- Search (e.g. property/ rooftops; discarded items/ weapons; remote area)
- Scene footage,
- Securing buildings
- Static operations
- Thermal flyover
- Top cover
- Training and demonstrations.

Drones are praised as operationally valuable and distinct policing tools because they:

- Offer an aerial view and enable the collection of image, video and sensor data, which can be rapidly shared to provide critical real-time information
- Can be rapidly deployed and used to enter and assess remote, inaccessible and dangerous locations and environments, lowering risks to officers on the ground
- Are associated with both cost and 'peoplepower' savings.

While drones are not currently included in the National Police Air Support (NPAS) fleet, rather are funded and deployed by individual forces, participants compared drones to traditional police air support, such as helicopters.

They highlighted that given their 'operational envelopes' helicopters remained essential for: operations at 'higher altitude' (above 400ft), 'pre planning for major events', 'vast' area searches, 'officer uplift', and Beyond Visual Line of Sight flight (e.g. vehicle pursuit). Understanding drones as an additional rather than replacement tool, they observed that drones can:

- Increase access to air support, both for forces located between NPAS bases, and because 'local drone ownership' does not require NPAS resourcing / 'requests for service'
- Be quicker to deploy and can be cost effective for 'lower priority' operations or those that can't justify the cost of 'deploying conventional NPAS aircraft'. Drones can be purchased outright by forces, leased, and/or shared between partnering forces/ agencies
- Be more suitable for particular operations (e.g. methodical rather than 'large orbit' flyovers over confined areas), and enable frequent and repeat flyovers (e.g. over hotspots)
- Be less disruptive (e.g. to locations such as railways) and are associated with a reduced 'environmental impact' (e.g. noise and carbon production). [4]

Participants also noted both exploring and trialling novel and drone applications, including:

- Livestreaming footage to ground based mobile devices, 'control rooms or command' in real time
- Drones with LiDAR (remote sensing method to develop 3D models and maps) for 'building clearance', 'automated searching' (e.g. collapsed structures), and/or to develop a map of 'crime scenes' for use in court
- Tethered drones (instead of cherry pickers) with cameras to counter connectivity / telecommunications issues encountered at large scale events
- Modifying drones with attachments such as a winch (e.g. to lower items in a hostage or kidnapping) and loudspeaker (e.g. to deliver messages)
- Sensors, including electronic sniffers (to look for chemical signatures of decomposition), CBRN kit (to 'avoid putting responders in a hot zone'), and sonar (to support water searches).

3. CHALLENGES AND BARRIERS TO POLICE DRONE USE

While police drone use continues to grow, participants described a range of challenges and barriers to drone use, including: regulation; internal resourcing and national/or centralised dialogue; technical and operational limitations; public perception and engagement.

Regulation

Frequency of changes: Participants raised the 'frequency' of changes to regulation as an issue impacting workload (both for their own operations, e.g. amendments to operations manuals, 'emailing the team changes'; and in relation to policing drone misuse). It should be noted that in August 2023 the Civil Aviation Authority (CAA) launched a Call for Input into a 'Review of UK UAS Regulations' (CAP 2569).[5]

Emergency service exemptions: While the CAA formerly had in place an exemption for the emergency services (ORS4 No.1233) permitting 'a more flexible, but controlled, use' of a small drone 'during emergency operations where an increased risk to life becomes apparent at short notice', this was withdrawn on 11 February 2022. While it will be replaced by a memorandum of understanding that the CAA is currently working on with the Department for Transport, the interim period has caused confusion, with some participants describing receiving 'conflicting messages' from the CAA and the National Police Chiefs' Council (NPCC). The CAA advises that while police drone operations fall outside of 'UK Regulation (EU) 2019/947', there is a requirement 'that police UAS operations take due regard of the safety objectives of the Basic Regulation', and that until new 'policy is in place…current NPCC guidance is that all police UAS operations remain within the confines of extant regulation'.[6]

Desire for routine Beyond Visual Line of Sight: Participants discussed regulatory limitations around Beyond Visual Line of Sight (BVLOS) flight. While highlighting that restrictions may impact forces in urban contexts more (as visibility may be greater / less interrupted in rural contexts), participants also recognised technological issues (e.g. interference and loss of signal) in such environments. The CAA's Airspace Modernisation Strategy foregrounds exploration of BVLOS drone operations, and the NPAS is also exploring the value of BVLOS drones for the future of police air support.

Legacy aircraft: The issue of forces using 'legacy aircraft' which are 'set to be scrapped' was raised by one participant. In June 2022 the CAA undertook consultation on extending the Legacy and Transitional UAS provisions in the Open category. They advised that 'all provisions should be extended and the class marking scheme should be reevaluated'. Following 'a formal decision from the Department for Transport', the CAA confirmed that 'transition and legacy provisions will be extended to 1 January 2026'.[7]

Internal resourcing and national and/or centralised dialogue

Financial pressures: Participants raised the challenges of obtaining funding from the 'core policing budget'. While describing drones as comparatively affordable kit, they added that the drone's shorter operational 'lifespan' can add complexity to budgeting. They highlighted the importance of undertaking and documenting 'benefit analysis' in order to communicate the utility of drones to senior management.

Ongoing training: Participants described the need for and importance of ongoing training to ensure regulatory adherence and to avoid any 'inadvertent breaches'.

Need for further discussions at 'the national level': Some participants advocated for the 'centralisation' and 'standardisation' of police drone training provision, akin to 'police driving, taser use' etc. Others favoured more locally and force-driven approaches, highlighting different force needs and geographical differences in operation type, weather, and population density. In 2022, HM Government reported 'significant investments' in supporting the NPCC and the NPAS to 'work together to introduce oversight of drone procurement, training and operational standards for policing'. Announcements regarding NPCC work underway include the development of a Centre of Excellence 'aligning drone training and procedures to a national standard', and a 'BVLOS Pathway Programme'.

Foreign technology: Some participants raised the reliance of UK police on 'foreign technology' (e.g. DJI drones), which remain embroiled in concerns around data security and human rights abuses, and the supply chains of which have been impacted by the rapid increase in consumer drone use in warfare, resulting in challenges in 'getting simple bits of kit'.

Technical and operational limitations

Weather resilience: Participants highlighted 'weather resilience', and the impacts of hot, cold and inclement weather on the efficacy of their drones (e.g. impacting batteries and sensors).

Operational limitations: Participants highlighted that drone use can be confined to 'over static operations', issues with the frequencies drones operate on (which can experience 'congestion' impacting range, or competition and potential interference, based on Ofcom assigning frequencies to MoD or short term 'television' media), and encountering connectivity issues at large events because the drone's 'downlink' goes via '5G' and when mobile networks are under pressure, the 'latency can be really bad'.

Public perception and engagement

Communication: While participants described the majority of their interactions with the public as positive, they noted negative responses to Covid-19 related police drone use, described receiving 'quite a lot' of Freedom of Information requests (e.g. related to privacy), and encountering members of the public asserting that police could not 'fly drones over their land'. They stressed the importance of 'decent communication skills' and explaining 'what we're doing and why', using 'signage, cones' and clear marking where drone use was overt, and public engagement through social media, at schools, and at community events, to show kit, explain 'what we do', and enable the public to 'ask questions'.

4. DRONE MISUSE

While emerging as 'transformative technologies' for police response, [8] drones are also readily accessible to a growing number of users. While many drone pilots adhere to regulations and fly responsibly, incidents of both reckless and negligent, and malicious and criminal drone flight and misuse nonetheless continue. From drone incursions at airports and in proximity to manned aircraft, flight over sensitive facilities, to transporting contraband into prisons, drone misuse raises a range of safety, security and nuisance concerns. While the CAA 'takes breaches of aviation legislation seriously and will seek to prosecute in cases where dangerous and illegal flying has taken place', it underscores that per a Memorandum of Understanding, responsibility for 'action against the misuse of drones' is led by the police. [9]

The CAA urge citizens to report any misuse of drones to their local Police force.

When discussing encountering and responding to drone misuse, participants raised:

Types of misuse: Participants described a range of encounters spanning reckless and ignorant, and criminal and malicious drone misuse. These included hobbyist drone flight causing injury, tourists flying around landmarks, flight over railways and trains (causing service disruption), 'a lot' of incidents of 'high altitude flying', as well as flights in proximity to aircraft and airports. While noting that intent can be hard to discern in some cases, they also described encounters with criminal or malicious drone use, including: incursions at football matches (match disruption, associated with fraudulent behaviour), horse racing (live streaming races to 'gambling syndicates'), flights over television and film sets (prompting concerns around leaked 'plot lines'), flights to 'scout out areas ahead of a crime', flown over schools (paedophilia), and used to transport contraband into prisons.

Tools for response: Participants described the importance of incident recordkeeping and the desire to focus on 'education' first 'as opposed to enforcement', given the majority of cases involved individuals that didn't 'understand what they're doing'. Participants sought to raise awareness of the *Drone and Model Aircraft Code*, which applies to many hobbyist flights. Where necessary, the participants also 'use' relevant legislation, including the Air Navigation Order 2016 (as amended) (e.g. articles 240 and 241 regarding endangering an aircraft or permitting an aircraft to endanger any person or property), and the Air Traffic Management and Unmanned Aircraft Act 2021, which details police powers in relation to drones. Where officers suspect a drone could be 'involved in the commission of an offence', they are permitted a range of actions (including instructing the pilot to land, stop and search, and confiscation of equipment). The legislation also introduces a 'fixed penalty system' which is under development. Some officers (e.g. with force jurisdictions covering airports) described access to and deployment of 'counter-drone kit'. Counter-drone technology refers to 'systems designed to detect, track, identify and/or intercept drones' and while growing in adoption, it remains associated with a 'range of hurdles' (e.g. costs, 'coordination, planning, and safety'). [10] The Government's *Counter-Unmanned*

Aircraft Strategy stresses the importance of such 'technologies to act against malicious drones' and details goals around resourcing 'access to training, technology and legal powers' to 'address drone-based threats'. Work is also underway by the NPCC's Counter Drones unit, which are developing 'counter drone capability'.[11]

Presence of external drones at emergency operations: External drones (e.g. hobbyist and media/ journalist drones) can impact, disrupt and halt emergency operations. Police respond by 'putting an emergency restriction in airspace' (though noted this takes time), and by citing regulatory guidance to external pilots, including the Drone and Model Aircraft Code and CAP722, which state that 'you must keep out of the way and not fly in any way that could hamper the emergency services when they're responding to an emergency incident'.

Internal resourcing: Officers described efforts to 'upskill' drone teams (e.g. develop awareness of police powers), and to provide drone-related information to 'the rest of the force' (via the intranet or helplines) to enable more 'confident' responses to drone misuse. They added that additional training, inclusion of training as part of 'officers' CPDs' and wider access to courses (e.g. drone forensics) would be beneficial. Others stressed challenges around finance, 'manpower', keeping training up-to-date, and issues with 'drone auditors' (social media 'content creators' flying drones with the aim of 'auditing the activities of authorities' such as police and private land owners),[12] adding that attempts to 'catch out' or 'embarrass officers' underscored the need for and importance of training and internal communications.

5. THE FUTURE OF POLICE DRONE USE

Drone technology continues to develop rapidly. When asked how they imagined police may use drones in the future and what they would like to see possible, participants described:

- Desires for a 'drone in every car', though noted the challenges around 'roll out' (e.g. training to fly, need to keep 'software and hardware' updated)
- Desires for '24 hour coverage', enabled by drones 'flying over 5G' and supported by a 'command and control centre' able to 'take over' drones once they're launched. They also described utilising 'fixed wing drones' at 'high altitudes' and equipped with 'powerful

cameras'. Such developments, they noted, were impacted by money, legislation, and wider considerations accompanying drone flight of drones over 'highly populated areas'
- Aspirations based on 'legislation' more 'than technology'. Participants described a desire for 'specific qualifications for emergency services' that recognised they are 'already highly trained' and that they 'hold massive amounts of responsibility for public safety from the very start'. They also returned to BVLOS, describing it as a 'capability…not being realised'. Highlighting international BVLOS developments such as Drone as First Responder (DFR) in the USA, they stated that the UK's 'legal framework' is not currently 'there to support' BVLOS, though they felt it was a question of 'when' not if it would be. Relatedly, the NPCC is undertaking work in the area of DFR.[13]
- Aspirations for increased technical capability, including improvements to 'camera capabilities' and the pairing of drones with technologies such as augmented reality (providing a map 'overlay' with street names to 'pinpoint an address'), 'machine learning and AI' (to assist 'missing persons searches'), and facial recognition (assisting with 'public order' operations, with drones rather than 'spotters on the ground' to 'identify nominals').

Echoing the UK Government's vision statement that 'by 2030 commercial drones will be commonplace in the UK' and will 'share the airspace…with other users',[14] participants expressed concerns about:

- How emergency service drone operations would be accommodated and/or 'prioritised' in 'busier skies'. While recognising ongoing discussions around remote identification and electronic conspicuity,[15] participants highlighted the importance of airspace visibility, sharing ideas on how emergency service drones could be prioritised (e.g. classifying '400ft to 500ft' as 'emergency services use only', or the use of dedicated frequencies/ bandwidths, 'atypical airspace', or a 'forced' return to home function for external drones).
- Evolving airspace introducing challenges to threat identification (e.g. routine versus 'malicious aircraft', and the potential targeting of critical infrastructure, including the 'police drone network'), requiring 'growth in the counter drone area'.

6. RECOMMENDED FURTHER READING

- Jackman A (2023) *Police Drones: Use, Challenges, Futures* [link]
- College of Policing (2023) *Drones – five things you need to know* [link]
- HMICFRS (2017) *Planes, drones and helicopters: An independent study of police air support.* Her Majesty's Inspectorate of Constabulary and Fire & Rescue Services [link]
- Civil Aviation Authority (2019) *The Drone and Model Aircraft Code* [link]
- CAP722 (2022) *CAP 722: Unmanned Aircraft System Operations in UK Airspace* [link]
- Air Traffic Management and Unmanned Aircraft Act 2021 [link]
- POSTnote (2020) *Misuse of Civilian Drones* [link]

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[1] UK Drone Watch (2020) *Benchmarking police use of drones in the UK* [link]

[2] Westminster Business Forum (2023) *Next steps for drone regulation and use in the UK* [link]

[3] Jackman, A. (2023) *Police Drones: Uses, Challenges, Futures* [link]

[4] HMICFRS (2017: 87, 83, 86) *Planes, drones and helicopters: An independent study of police air support.* Her Majesty's Inspectorate of Constabulary and Fire & Rescue Services [link]

[5] CAP 2569 (2023) *Call for input: Review of UK UAS Regulations* [link]

[6] Civil Aviation Authority (2023) *Introduction to drone flying and the UK rules* [link]

[7] Civil Aviation Authority (2022) *UAS in the Open Category* [link]

[8] Crown Commercial Service (2023) *Drone technology for the blue light sector* [link]

[9] CAP722 (2022: 23) *CAP 722: Unmanned Aircraft System Operations in UK Airspace* [link]

[10] Martins BO, Holland Michel A, Silkoset A (2020: 5) *Countering the Drone Threat: Implications of C-UAS Technology for Norway in an EU and NATO Context* [link]

[11] Geeksvana (2022) *The Drone Police Are Coming – Ask Your Questions - NPCC CUAS* [link]

[12] Geeksvana (2022) *Will the AUDIT channels RUIN the UK drone hobby?* [link]

[13] LinkedIn (2023) *Stuart Lawless, Drone Portfolio at NPCC. Drone as first responder* [link]

[14] HM Government (2022: 10) *Advancing airborne autonomy: Commercial drones saving money and saving lives in the UK* [link]

[15] See NATs (2022: 5) *South of the clouds: The next generation of uncrewed aviation* [link]; CAP2569 (2023) *Call for input: Review of UK UAS Regulations* [link]