

Response from Professor Iain Gray CBE FREng FRSE FRAeS  
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This is an exciting time for the UK's drone sector. The couple of years since the launch of the *Future Flight* Challenge and against the backdrop of Covid we have seen many great examples of 'drones for good' in our society reinforcing quite publicly the significant role that drones can play in saving lives and solving problems, as well as boosting our economy. Drone technology, powered by advances in robotics, battery power and artificial intelligence, is on the cusp of delivering new breakthrough capabilities, and is seeing increasing levels of investment in the UK and overseas. Drones contribute to the green agenda and our progress to net zero on multiple levels. And the sector is a prime opportunity to fulfil Government's Innovation Strategy ambition 'to support innovation in places, sectors, and businesses across the UK, we can level up the economy and create high-value new jobs and trading opportunities as we build back better'.

However this will not happen without the right policy and regulatory support. From my perspective as Chair of the Drone Industry Action Group, I see a need to:

Drive public engagement for drones: Often considered only as an afterthought, we see the critical importance of supporting positive public and industry perceptions of drones. PWC's 2019 '[Building trust in drones](#)' work and recent surveys sponsored by government [CPC's Trinity McQueen study] show very high awareness of drones and overwhelming public support for positive drone use, in particular by emergency services, coastguard, etc. Additionally, the recent published experience of Manna and others in domestic drone delivery show strong local support for these services once they are up and running. But there remain sizable communities who are negative about the use of drones and may drones become more prevalent they are a real potential constraint to sector growth. ***Government should build on the activities of the Connected Places Catapult and drive forward their findings on public engagement.***

Support drones ability to lower risk: As well as getting on the front foot communicating the public benefits delivered by drones (such as [rescuing people](#)) and the potential for technology to lower overall risk across the aviation sector, Government's regulatory bodies should look to promote the use of drones in the many instances where drones reduce risks, not increase them. They reduce the requirement for humans to operate at dangerous heights, in remote locations or in confined spaces. They reduce the danger of death from crewed helicopters, aircraft or vehicle delivery. This assessment of the broader benefits and risks to human life is not considered by the CAA when assessing the risks of drone use. The nuclear and oil and gas sector have been early adopters largely due to their proven safety benefits, as well as their cost and carbon savings. Sellafield uses drones and robotics to help manage their decommissioning challenges, saving taxpayer money Similar benefits are beginning to be achieved in construction and infrastructure inspection and in other industrial sectors and public use cases such as police, fire, coastguard and military. ***The CAA and HSE should cooperate with sector councils and trade bodies to assess where proven, effective and affordable drone solutions can be deployed to save lives.***

Enable cellular comms for airborne use: The UK is at the leading edge when it comes to aviation regulation, but for cellular it seems we are well behind. With a concerted effort, there is an opportunity here for the UK to steal a march. It's not widely known that airborne use of cellular is currently prohibited. Wide range of use-cases are not viable and a universal traffic management

system is hardly necessary if comms remains unsolved. **Government, via Ofcom, should look to enable cellular comms for airborne use at the earliest possible opportunity.** This will require both technical and regulatory effort, but without it, comms could become the major blocker to BVLOS flight. And without BVLOS the longer-term ambitions of the drone sector will never be achieved.

Build an effective digital UAV traffic management (UTM) system: Cellular comms is one component of a wider essential infrastructure for drone technology, namely a universal, accessible and effective real time traffic management system, used by all airspace traffic. Without a government strategy for a physical infrastructure for all manned and unmanned aircraft at low-level and mandating Electronic Conspicuity, UTM will not flourish. The reason UTMs are set up around airports is to leverage their radar solutions for manned traffic. Individual counter-drone solutions are too expensive; we need a cooperative physical and digital infrastructure that mandates sharing of data. Only when we have a system not wholly reliant on a single technology (GPS) will the system be robust. **Government must deploy a clear collaborative physical and digital infrastructure roadmap** that supports, in order, low level surveillance, the UTM services built on top of that and robust shared data solutions that solve a singular reliance on GPS. This can take advantage of the work of the Connected Places Catapult in demonstrating Open Access UTM capability. This will allow innovators to extend and deliver the benefits of drones, supporting a federated system of services that can operate by common standards, yet evolve to deliver new real time services.

Support a well resourced regulator and new standards: Drone application opportunities exist across the globe. There is a real opportunity for the UK to assume a global technology lead on drones but more significantly, by leveraging the CAA's reputation and expertise, we can put the right regulatory framework in place that becomes the standard across the world, just as the CAA Sandbox inspired other countries to create their own. **Ensure the CAA has sufficient resources and capabilities devoted to drones with a clear delegated authority that can deal with the complexities of moving from small uncrewed aircraft into much larger future aircraft and uncrewed cargo aircraft.** Additionally the CAA needs to move to more automated procedures for registration, authorisation and real time management of drone operations. Importantly, it is critical to define the boundaries of where regulation stops and to establish the standards for operation across the sector. For example, we do not regulate where or why people drive, just that they are equipped with a licence and guided by a highway code, they and their vehicle are insured and vehicles are required to be regularly certified. We need to get this right for commercial drone sector, or we will never reap the more distant but enormous benefits of autonomous passenger flight.

I am very pleased, with colleagues from the Drone Industry Action Group, to be working with DfT and BEIS to articulate a strategic ambition for the sector. This is an important piece of work that will bring to life the immense efforts of all the dedicated and innovative researchers and entrepreneurs striving daily to deliver new solutions to the timeless challenge of flight: the software and robotics engineers, drone professionals, manufacturers, service integrators and users (from farmers to infrastructure and energy companies). Indeed, all who aspire to more autonomous, connected, electric flight in the future. Noting the success of government's Office for Life Sciences and Centre for Connected and Autonomous Vehicles, I suggest Government consider how it links the range of government regulatory, innovation, funding and policy activities for drones together; either through a dedicated cross Government 'office for Future Flight' or lead policy team working across all aspects of government focussed on accelerating the safe adoption of new aviation technologies and their exploitation in the UK and internationally.

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