

<b>Title:</b> Aviation Autonomy <b>IA No:</b> LAWCOM0090 <b>RPC Reference No:</b> N/A <b>Lead department or agency:</b> Law Commission <b>Other departments or agencies:</b> Civil Aviation Authority/ Department of Transport	<b>Impact Assessment (IA)</b>			
	<b>Date:</b> 13.04.2026			
	<b>Stage:</b> Development/Options			
	<b>Source of intervention:</b> Domestic			
	<b>Type of measure:</b> Primary legislation			
	<b>Contact for enquiries:</b> aviationautonomy@lawcommission.gov.uk			

**Summary: Intervention and Options** **RPC Opinion: Not Applicable**

Cost of Preferred (or more likely) Option (in 2025/26 prices)			
Total Net Present Social Value N/A	Business Net Present Value N/A	Net cost to business per year N/A	Business Impact Target Status Qualifying provision

**What is the problem under consideration? Why is government action or intervention necessary?**  
Increased automation has the potential to deliver substantial benefits to the entire aviation system, UK industry and the public. A DfT commissioned study forecasts that future of flight markets, specifically the uncrewed aircraft systems (UAS) and advanced air mobility (AAM) markets, could generate up to £5.7 billion in annual revenue by 2050, equivalent to 19% of the annual revenue of the UK aerospace sector in 2023 (Frazer-Nash Consultancy, *Future of Flight Scenarios Futures Research Report* (March 2025)).  
To realise these benefits, the UK’s legislative and regulatory framework needs to be sufficiently agile to facilitate innovation whilst maintaining the aviation sector’s very high safety standards. However, the current regulatory framework for aviation does contain gaps, barriers and uncertainties which hinder the potential approval and deployment of advanced future flight technology. Furthermore, the mechanisms for assigning liability when things go wrong may prove inadequate in the context of highly automated aircraft.  
For these reasons, there needs to be reform.  
Since civil aviation is mainly regulated by legislation, statutory intervention is required to deal with problems arising from the legal framework.

**What are the policy objectives of the action or intervention and the intended effects?**  
The policy objectives are to:

- Reform the UK’s legislative and regulatory framework so it is prepared for future advances in automation and ultimately, autonomous flight.
- Enable innovations in remotely piloted and autonomous flight to take place lawfully, whilst ensuring the framework maintains aviation’s high level of safety.
- Ensure there are appropriate legal mechanisms for attributing criminal and civil liability when things go wrong.

**What policy options have been considered, including any alternatives to regulation? Please justify preferred option (further details in Evidence Base)**  
Option 0: Do Nothing  
Option 1: Full implementation of the Law Commission’s recommendations

<b>Will the policy be reviewed?</b> It will/will not be reviewed. If applicable, set review date: Month/Year				
Is this measure likely to impact on international trade and investment?		Yes / No		
Are any of these organisations in scope?	<b>Micro</b> Yes/No	<b>Small</b> Yes/No	<b>Medium</b> Yes/No	<b>Large</b> Yes/No
What is the CO <sub>2</sub> equivalent change in greenhouse gas emissions? (Million tonnes CO <sub>2</sub> equivalent)		<b>Traded:</b>		<b>Non-traded:</b>

*I have read the Impact Assessment and I am satisfied that, given the available evidence, it represents a reasonable view of the likely costs, benefits and impact of the leading options.*

Signed by the responsible SELECT SIGNATORY: \_\_\_\_\_ Date: \_\_\_\_\_

# Summary: Analysis & Evidence

# Policy Option 1

Description: Full implementation of Law Commission recommendations

## FULL ECONOMIC ASSESSMENT

<b>Price Base</b> Year 2025/26	<b>PV Base</b> Year 2025/26	<b>Time Period</b> Years 10	<b>Net Benefit (Present Value (PV)) (£m)</b>		
			<b>Low: Optional</b>	<b>High: Optional</b>	<b>Best Estimate: N/A</b>
<b>COSTS (£m)</b>	<b>Total Transition</b> (Constant Price) Years		<b>Average Annual</b> (excl. Transition) (Constant Price)		<b>Total Cost</b> (Present Value)
<b>Low</b>	N/A		N/A		N/A
<b>High</b>	N/A		N/A		N/A
<b>Best Estimate</b>	N/A		N/A		N/A
<b>Description and scale of key monetised costs by 'main affected group'</b> None					
<b>Other key non-monetised costs by 'main affected groups'</b> Transitional: Training on application of new regulation requirements [Aviation regulator]; Cost of funding CAA – Aviation industry; Cost of drafting new legislation/guidance Ongoing: Continuous oversight of approved/certified UAS operators [CAA]; UAS aircraft maintenance, regular update of digital software, insurance costs [Industry]; Potential for increased litigation – drones in particular [Industry]; Potential for loss in privacy and property infringement [Members of the public].					
<b>BENEFITS (£m)</b>	<b>Total Transition</b> (Constant Price) Years		<b>Average Annual</b> (excl. Transition) (Constant Price)		<b>Total Benefit</b> (Present Value)
<b>Low</b>	N/A		N/A		N/A
<b>High</b>	N/A		N/A		N/A
<b>Best Estimate</b>	N/A		N/A		N/A
<b>Description and scale of key monetised benefits by 'main affected groups'</b> None					
<b>Other key non-monetised benefits by 'main affected groups'</b> Ongoing: Drones potential for faster delivery of medical tests/consumer goods and assistance to those in remote places and those in distress [e.g. Coastguard searches]; VTOLs potential for improved east-west links and access in remote areas and for those with mobility challenges; UTM potential for improved efficiency of existing ATM/ANS processes; Potential job creation and contribution to economic growth					
Key assumptions/sensitivities/risks					<b>Discount rate</b>

## BUSINESS ASSESSMENT (Option 1)

<b>Direct impact on business (Equivalent Annual) £m:</b>			<b>Score for Business Impact Target (qualifying provisions only) £m: N/A</b>
<b>Costs: N/A</b>	<b>Benefits: N/A</b>	<b>Net: N/A</b>	

# Evidence Base

## A. Background

### Introduction

1. Automation already plays a significant role in aviation, helping to keep flights safe and efficient. Recent breakthroughs have seen the development of new, innovative highly automated systems and vehicles including drones; as well as advanced air mobility vehicles, such as vertical take-off and landing (VTOL) aircraft which can provide short journeys for a small number of people.
2. Greater use of automation in new aviation technology has the potential to bring wide-ranging benefits for passengers, the aviation industry and the UK economy. It could improve safety, reduce delays, support new services in rural and urban areas, and help UK businesses stay competitive. To make the most of these opportunities, the UK's laws and regulations must be flexible enough to support innovation, while still ensuring that aviation remains one of the safest sectors in the world.
3. The pace of technological change is exposing where legacy, highly prescriptive aviation law does not map neatly onto the realities of uncrewed and highly automated operations. It has become evident that the current regulatory framework has gaps, uncertainties and barriers that potentially hinder the safe deployment of new types of aircraft operations.
4. To support this era of rapid technological advancement in automated aviation, often referred to as the "third aviation revolution", the Civil Aviation Authority (CAA) and Department for Transport (DfT) have asked the Law Commission to review the law concerning highly automated and autonomous flight.
5. In particular, the Law Commission has been asked to look at three use cases: drones (defined as remotely piloted, non-passenger carrying vehicles), advanced air mobility (in particular vertical take-off and landing or "VTOL" aircraft providing short journeys for up to ten people), and air traffic management and air navigation services (ATM/ANS).
6. The three-year review is partly funded by UK Research & Innovation (UKRI) through the Future Flight Challenge, delivered by Innovate UK and the Economic and Social Research Council. It examined the existing legal framework to identify the challenges and opportunities linked to the introduction of highly automated systems into the aviation sector.

### Terminology

7. Aviation is a field with a great deal of specialist terminology and so to avoid loss of precision, some of these technical terms are used in this Impact Assessment. To assist the reader, the key terminology is summarised in the Glossary at the end of this impact assessment.

### Consultation

8. Consultation lies at the heart of our approach to law reform, serving as a critical mechanism for transparency, legitimacy, and informed decision-making. Once initial research and scoping, and stakeholder engagement is complete, we publish a consultation paper outlining the current law, its shortcomings, and provisional proposals for change.
9. We actively seek input through stakeholder meetings, seminars and written submissions, ensuring that voices from across society, including academics, practitioners and the public, shape the reform process. This engagement not only enriches the evidence base but also fosters trust and accountability, enabling us to refine our recommendations in light of diverse perspectives before moving to policy development and reporting.

10. In the course of this project, we published two consultation papers.
11. Our first consultation paper, published in February 2024, looked at the law relating to drones and VTOLs (our first two use cases). Regarding the latter, we focused on uncrewed VTOLs: passenger carrying operations which do not have an onboard pilot. In the paper, we considered a range of issues related to uncrewed aircraft systems (UAS) including the roles and responsibilities of remote pilots and operators, certification, and liability.
12. Due to the distinct issues related to ATM/ANS (our third use case), including different legislation, we looked at the topic in a separate consultation paper published in April 2025. The second consultation paper focused on the provision of ATM/ANS to UAS; the shorthand we use to describe this use case is uncrewed aircraft systems traffic management (UTM). The development of UTM is a key enabler of achieving the UK's stated goal of an integrated airspace, in which UAS share the airspace with crewed aircraft where it is safe to do so.<sup>1</sup>
13. The consultation for our first paper ran from 26 February 2024 to 28 June 2024. We received 53 consultation responses. The consultation for our second paper on UTM ran from 16 April 2025 to 18 July 2025. We received 23 responses.
14. For both consultation papers, responses were submitted by a range of consultees including UAS developer/operators, general aviation groups, trade associations, developers of automated systems, ATM/ANS providers, legal experts and aviation regulators.
15. Alongside formal consultation responses, we held over 150 meetings with stakeholders, delivered seminars on the project, and attended specialist aviation conferences.

## **Problem Under Consideration**

16. Although a legal framework exists for uncrewed aircraft systems (UAS), set out in the UAS Delegated (2019/945)<sup>2</sup> and Implementing (2019/947)<sup>3</sup> regulations, the current law contains several gaps, uncertainties and barriers which could prevent the deployment of highly automated and autonomous aircraft. These issues are discussed below in further detail.

### Roles and responsibilities for highly automated drones

17. Many of the current regulations regarding aviation operations were not written with the possibility of UAS in mind and so existing roles and responsibilities do not neatly map onto the roles of the remote pilot and the UAS operator.
18. This is an issue particularly for certified UAS operations, which due to their higher safety risk are subject to the same regulation as crewed aviation. We consider whether the definitions of traditional aviation roles set out in existing regulations need to be clarified to extend to UAS operations, and whether certain responsibilities require modification.

### Remotely piloted VTOLs

19. VTOLs raise issues distinct from drones due to the presence of passengers. In traditional aviation, the pilot and crew have several duties in relation to passengers but with uncrewed VTOLs, the pilot is not on the aircraft and there may be no on-board cabin crew.
20. In our final report, we consider whether the responsibilities of pilot and crew for traditional aviation should be maintained for VTOLs or transferred to another actor like the operator.

### Autonomous operations

21. Autonomous operations are operations during which a UAS operates without the remote pilot being able to intervene.

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<sup>1</sup> CAA, *Airspace Modernisation Strategy 2023-2040 Part 1: Strategic objectives and enablers* (February 2024) (CAP 1711) pp 19 to 22.

<sup>2</sup> UK Regulation (EU) 2019/945 on unmanned aircraft systems and on third-country operators of unmanned aircraft systems.

<sup>3</sup> UK Regulation (EU) 2019/947 on the rules and procedures for the operation of unmanned aircraft.

22. Currently, there are a lack of operational rules for autonomous uncrewed aircraft, and so we consider what the requirements should be and how duties which would otherwise be held by the remote pilot could be transferred to the operator.

### ATM/ANS

23. There are elements of the regulatory framework for ATM/ANS which do not easily fit with UTM, preventing the certification of UTM service providers.

24. In particular, the ATM/ANS legal framework does not cover all the expected UTM services; imposes requirements which are disproportionate or irrelevant to UTM; and does not enable new models of service provision. Hence, we consider whether the law needs reforming to accommodate UTM, which is a necessary enabler of a more integrated airspace.

### Liability issues

25. There are aspects of the current liability regime pertaining to aviation that require modernisation to ensure UAS operators, remote pilots and other actors are appropriately held to account in the event of an accident or wrongdoing.

26. For example, the current formulation of the criminal offence of hijacking does not cover the scenario of a drone being hacked remotely, and the exemption for aircraft from actions in trespass and nuisance dates to the 1920s and so does not envisage UAS operations. To remedy these issues, our final report looks at the reforms necessary to ensure civil and criminal liability regimes adequately serve their purpose in the context of UAS operations.

## **B. Rationale and Policy Objectives**

### **Rationale**

27. Legal and regulatory uncertainty acts as a barrier to efficient market functioning. When firms cannot predict how existing rules apply to emerging technologies they face increased risk premiums on investment, delayed or foregone entry into the market and under-investment in innovation.

28. Coordination failure arises as firms wait for regulatory clarity before investing, while regulators rely on industry development to understand the market. The consequence is suboptimal market activity and slower technological diffusion, leading to lower productivity growth than would otherwise be achievable in a well-regulated environment.

29. Highly automated and autonomous aviation technologies create information asymmetries between operators, consumers, insurers and regulators. Without a modernised regulatory framework consumers and insurers cannot accurately assess risks, operators may have incentives to under-invest in safety and the market may fail to provide appropriate risk-mitigation services such as insurance. This creates negative safety externalities through risks borne by third parties such as passengers, other airspace users or those on the ground. Government intervention helps internalise these externalities by setting clear safety obligations, aligning private incentives with social welfare.

30. Airspace may be considered a public good as it is somewhat non-excludable but also prone to congestion and safety risks as usage increases. Efficient use requires coordinated rules, traffic management protocols and infrastructure standards. Government intervention is required to ensure interoperability across providers, avoid fragmentation of airspace management and support a coherent national system with shared standards. Without this the market may gravitate towards incompatible proprietary solutions, increasing costs and reducing overall efficiency.

31. When laws designed for crewed aviation are applied to uncrewed or autonomous operations without adaptation, compliance may become disproportionately burdensome. This creates artificial barriers to entry for innovative firms, over-protection of incumbents or traditional

aviation actors and reduced competitive pressure leading to lower innovation and higher prices. Regulatory reform can help ensure proportionate requirements that reflect actual risks supporting more contestable and competitive markets.

32. Insurance markets rely on clear definitions of responsibility and liability. When legal frameworks do not specify who is responsible for particular duties insurers face difficulty pricing risk, uncertainty that limits coverage availability and higher premiums or exclusions for new technologies. This leads to missing markets where economically valuable activities cannot proceed because financial risk cannot be managed. Government action is required to modernise liability rules reducing contracting costs enabling insurance markets to operate efficiently and facilitating investment. By so doing government intervention unlocks dynamic efficiency as firms invest in research and development enabling capability development. International competitiveness is secured as the UK benefits from first mover advantages as its regulatory framework for uncrewed aviation ensures it remains an attractive environment for innovation and investment.

### **Policy objectives**

- Reform the UK’s legislative and regulatory framework so it is prepared for future advances in automation and ultimately, autonomous flight.
- Enable innovations in remotely piloted and autonomous flight to take place lawfully, whilst ensuring the framework maintains aviation's high level of safety.
- Ensure there are appropriate legal mechanisms for attributing criminal and civil liability when things go wrong.

### **Main Stakeholder Groups, Organisations and Sectors**

- Aviation lawyers
- Civil Aviation Authority (CAA)
- Department for Transport
- Future of flight technology developers/operators
- General aviation
- Insurers
- NATS (ATM/ANS provider)
- Public authorities

## **C. Description of Options Considered**

33. The following options are considered in this IA:

**Option 0 – Do nothing.**

**Option 1 – Full implementation of the Law Commission’s recommendations**

**Option 0 – Do nothing.**

34. Under this option, no changes would be made to the law concerning uncrewed aircraft systems (UAS) or automation in aviation more generally. Instead, the regulatory framework, including the framework for apportioning criminal and civil liability, would continue to apply in its current form.

35. It is not straightforward to determine the precise implications of “doing nothing”. This is because the current framework for UAS to some extent accommodates highly automated and autonomous aircraft by allowing “applicable requirements” of existing regulation for

crewed aircraft to be applied to UAS operations in the Specific and Certified category. These are the more complex and high-risk UAS operations. In our view, there are four likely issues with continuing to rely on this regulatory model.

36. First, much of the existing aviation regulatory framework was not written with UAS in mind and so it will be difficult in any event to apply current regulatory requirements to highly automated and autonomous UAS operations.
37. Secondly, the phrase “applicable requirements” does not give developers clarity on what they need to do to bring their UAS technology to market. This uncertainty potentially delays deployment and holds back innovation.
38. Thirdly, applying “applicable requirements” of existing regulation to each individual operation is time consuming for the CAA and not sustainable in the long term. A more regularised model of regulation, in which requirements apply more broadly across different UAS operations, would be more transparent and potentially accelerate the approval process.
39. Fourthly, if we were to leave the current regulatory framework unchanged due to there being “applicable requirements” for UAS operations, issues with the civil and criminal legal regimes would persist, as would the problems in applying the existing ATM/ANS regulatory framework to UTM.
40. A further complication with Option 0 is that the International Civil Aviation Organisation (ICAO) is likely to establish standards and recommended practices (“SARPs”) in the future to govern highly automated and autonomous aircraft. Once adopted by ICAO, the UK would be in effect bound to implement these SARPs in domestic law. This means “doing nothing” is not feasible in the long-term.
41. Whilst it may be argued it is better to wait for ICAO to develop SARPs before proceeding with domestic regulation, this approach has its own problems as SARPs take a long time to develop and are influenced by regulations adopted at a national level. For these reasons, we do not believe that waiting for ICAO is the best way to achieve the stated policy objectives.

### **Option 1- Full implementation of the Law Commission’s recommendations (preferred option)**

42. Option 1 entails implementing all 38 recommendations set out in the report in full.
43. In contrast to Option 0 (“do nothing”), Option 1 would create a more comprehensive regulatory framework for drones, VTOLs and UTM by establishing key requirements needed to safely facilitate highly automated and autonomous aircraft. This would remove legal uncertainty and provide developers with the necessary clarity on what is required to obtain approval for deployment, thereby potentially shortening the time required to bring innovative UAS operations to market.
44. Below is an overview of those recommendations likely to be of particular public interest, as well as those with significant costs and/or the potential for savings:
  - A remote pilot of a commercial air transport operation should have the responsibilities of the commander of a crewed operation.
  - Where existing aviation regulations designed for crewed operations refer to a pilot in command or operator, this should include remote pilot in command and UAS operator.
  - Operators of remotely piloted VTOLs should be certified, and pilots of remotely piloted VTOL should be required to be licenced, following the classes and ratings adopted for crewed VTOLs wherever appropriate.
  - The powers of crew members on board a remotely piloted VTOLs should be broadened so they could take reasonable measures against disorderly passengers when it is impracticable to communicate with the pilot.

- There should be legislative change to accommodate the certification of UTM service providers.
- There should be a set of minimum requirements for using autonomous UAS, including avoiding any risk of colliding with crewed aircraft, complying with operational limitations and not flying close to areas where emergency response efforts are ongoing.
- The provision for exempting aircraft from liability in private nuisance and trespass should be modernised so the exemption appropriately applies to uncrewed aircraft.
- The principal legal mechanism for assigning criminal liability in the Air Navigation Order 2016 should be reformed so it adequately applies in the context of highly automated and autonomous uncrewed aircraft.
- The relevant departments, bodies and agencies involved in the enforcement of drone misuse offences should consider adopting a new memorandum of understanding or formalising cooperation arrangements on the issue.

45. Full implementation of the recommendations has two main benefits.

46. First, it removes the gaps, uncertainties and barriers that prevent the approval and deployment of our three use cases: drones, VTOLs and UTM. With a clearer regulatory framework that lacks unworkable, unnecessary or irrelevant provisions; innovators can focus on ensuring their technology meets the necessary safety requirements.

47. Secondly, full implementation future proofs the regulatory framework to the greatest possible extent by accounting for technological advances up to the highest level of automation, which is autonomous operations.

48. We expect that under Option 1, not all recommendations would be implemented at the same time. For example, legal reform concerning highly automated drones and UTM could be enacted at a stage earlier than regulations concerning remotely piloted VTOL and autonomous operations because the latter is expected to have a longer term trajectory for deployment. The benefit of this iterative approach is that it enables the technical detail required to effectively implement regulation to be developed over time as the technology intended to be regulated matures. This is why the CAA has generally favoured iterative policy development in the context of future flight technology.<sup>4</sup>

49. Furthermore, the CAA is largely funded by charges paid by industry,<sup>5</sup> and so it is expected the CAA's capacity to implement the recommendations will increase as the future flight sector grows.

## D. Cost and Benefit Analysis

50. This IA follows the procedures and criteria set out in the IA guidance and is consistent with the HM Treasury Green Book.

51. This IA identifies monetised and non-monetised impacts on individuals, groups and businesses with the aim of understanding what the overall impact to society might be from implementing these options. To do this, the costs and benefits of the proposed options are compared to the baseline "do nothing" or 'business as usual' option.

52. IAs place a strong emphasis on valuing the costs and benefits in monetary terms (including estimating the value of goods and services that are not traded). However, there are important aspects that cannot sensibly be monetised – which might include

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<sup>4</sup> See for example, CAA, *Future of Flight: BVLOS Roadmap* (CAP 3182) (October 2025) p 5.

<sup>5</sup> CAA, *Annual Report and Accounts 2024/25* (CAP 3143) (July 2025) p 83.

whether the policy impacts differently on particular groups of society or changes in equity and fairness.

53. Only qualitative estimates are provided in the following analysis because there is currently a lack of reliable data to support robust numerical estimates.
54. Notwithstanding the above the assessment occurs over a ten year timeframe, with the present being year 0. We have assumed that the transitional costs and benefits occur in year 0, the current year, unless otherwise indicated. Ongoing costs and benefits accrue in years 1 to 10. A discount rate of 3.5 percent is generally applied when using monetised figures, in accordance with HM Treasury guidance. Unless otherwise stated all figures are in 2025/26 prices and have been updated using the GDP deflator to adjust for inflation.

## **Option 1: Full implementation of the Law Commission's recommendations**

### **Costs of Option 1**

#### **Transitional Costs**

55. There are several transitional costs associated with the implementation of our recommendations.
56. For the aviation regulator, the costs will mainly involve the training and retraining of colleagues to apply the new regulation, and to develop acceptable means of compliance (AMC), guidance material (GM) and certification specifications to support the implementation of the regulations. Depending on the CAA's current capacity, it may need to recruit more specialists who can assess and approve digital and automated technology. The CAA funds its regulatory tasks through charges to those subject to its oversight,<sup>6</sup> and so it is expected that most of these transitional costs will be borne by industry rather than taxpayers.
57. For the aviation industry, beyond the cost of funding the CAA, there will be costs in developing technology to a sufficient enough standard to comply with the new regulatory requirements. More broadly, there are likely to be costs outside the scope of our recommendations as we expect, in line with the objective to achieve an integrated airspace, traditional aircraft and ATM/ANS will need to adopt new technologies and procedures to ensure crewed and uncrewed aircraft can safely operate in the same airspace.
58. As with any regulation, there will also be cost associated with the drafting and enactment of any new primary or secondary legislation.
  - CAA -Training/Retraining for new responsibilities
  - Certifying systems: e.g. construction of a non-piloted aircraft
  - Regulatory role to be agreed – CAA impact [enforcement costs] -Estimate to be requested of different scenarios
  - CAA – recruitment of specialists
  - Air traffic management implications – potential for new systems and procedures with additional training costs
  - Capital costs

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<sup>6</sup> Civil Aviation Act 1982, s 11.

## Ongoing Costs

59. The CAA will have ongoing costs associated with the continuous oversight of approved/certified UAS operators, manufacturers, remote pilots and UTM providers. This oversight includes inspections, audits and regulatory enforcement. The CAA may also incur costs related to the criminal prosecution of those who contravene new regulation, although we expect CAA criminal prosecutions to remain low in line with existing trends.<sup>7</sup> There will also be costs associated with the updating of technical soft law material such as AMC and GM to reflect lessons learned from deployment.
60. As for industry, there will be ongoing costs to maintain UAS aircraft, update digital software, and to make any improvements required by the CAA, or the Air Accidents Safety Investigation Branch in the event of an accident. There will also be the ongoing cost of insurance, which UAS operators and UTM providers will be legally required to obtain.
61. Another potential cost relates to increased litigation, particularly in relation to drones which can fly at lower levels thereby posing greater risks to privacy and property infringement.
62. Regarding the cost to the wider economy, there may be a cost associated with job displacement as some use cases for UAS may replace human labour. However, the expansion of future flight technology may also create jobs (explained below in benefits).
- Regular specification updates – tri-annual perhaps
  - Increased litigation from privacy enforcement/air accidents etc.
  - Unclear whether the net effect would be job creation or loss – some displacement potentially in the delivery market as drones replace road delivery

## **Benefits of Option 1**

### Transitional benefits

None identified.

### Ongoing benefits

63. Enabling the routine deployment of drones, VTOLs and UTM has the potential to deliver several benefits.
- For drones, beneficial use cases include faster deliveries of medical tests and equipment; delivering post to remote areas which are hard to reach by existing modes of transport; and assisting the coastguard to find people in distress. Not only do drone use cases create efficiency savings regarding cost and time but they also have a safety benefit by reducing the need for humans to place themselves at risk in dangerous professions. For example, drones can be used, instead of humans, to inspect critical infrastructure like oil rigs and the National Grid electricity transmission network.
  - For VTOLs, potential benefits include providing better links between rural areas and improving mobility in locations which have limited transport options. VTOLs may also reduce congestion on the road by offering more transport options.
  - UTM is mainly an enabler of drones and VTOLs, but in the long term, the technology may be used for crewed aviation to improve the efficiency of existing ATM/ANS processes.

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<sup>7</sup>

See <https://www.caa.co.uk/about-us/the-cao/enforcement/enforcement-and-prosecutions/>.

64. These future flight technologies have the potential to create new job opportunities for remote pilots, manufacturers and ground staff. There may also be spillover effects for a variety of businesses, which can use UAS to expand their service offering, potentially creating rather than reducing jobs. These may include the following.

- More efficient delivery [esp. retail sector benefit]
- Opportunity to establish UK as innovation hub – attract inward investment/job creation.
- Improved East-west link potential as air taxis become an economically viable alternative. Enhanced access to underserved areas with concomitant increased employment potential. Potential for new markets.
- Reduced road congestion – with environmental benefits [reduced pollution/improved air quality]
- Improved emergency response [potential for reduced NHS costs]
- Small business positive spill-over impact as parts supplier for drones etc.

## E. Assumptions, Risks and Sensitivity Analysis

65. Legal reform is only one aspect of enabling the UK to be a global leader in the area of future flight technology. Other enablers include technological innovation; investments in digital infrastructure; appropriate training; and the creation of certification specifications, licencing processes, and AMC and GM by the CAA. This impact assessment assumes that these enablers will accompany any legal reform.

66. Furthermore, the future success of highly automated and autonomous flight relies on industry continuing to act in accordance with “just culture,”<sup>8</sup> ensuring lessons are continuously learned to improve safety. This impact assessment assumes that the future flight sector will adhere to the high standards of safety that are found in the crewed aviation.

## F. Wider Impacts

### Public Sector Equality Duty

67. Having researched extensively and consulted widely with a range of interested parties, we have not identified any evidence which indicates our recommendations adversely impact particular protected characteristics. We have completed the Equality Impact Assessment Initial Screening and are not required to complete a further full assessment.

### Additional considerations

68. We have considered international trade, economic growth, environment, rural issues, health and safety, consumer focus and regional perspectives. We have identified the potential for impact but lack sufficient evidence to evaluate the extent this may be.

## Glossary

- **Advanced air mobility (“AAM”)**: a generic term for a collection of new and emerging technologies intended for use for aviation transportation. It includes both crewed and uncrewed aircraft, used both in urban areas and for regional transport. In the context of this project, the term is usually used to refer to VTOL aircraft.

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<sup>8</sup> C Hodges, *Outcome-based cooperation: in communities, business regulation, and dispute resolution* (2022) p 396.

- **Air traffic management and air navigation services (“ATM/ANS”)**: the collection of air traffic management and air navigation services, as well as services which augment signals emitted by satellites of core constellations of GNSS for the purpose of air navigation; flight procedures design; and services consisting in the origination and processing of data and the formatting and delivering of data to general air traffic for the purpose of air navigation.
  - **Civil Aviation Authority (“CAA”)**: this is the UK’s regulatory body for civil aviation.
  - **Drone**: used generally to describe smaller uncrewed aircraft which are unoccupied and can be remotely piloted or autonomous.
  - **Integrated airspace**: airspace in which uncrewed aircraft can operate with crewed aircraft without segregation.
  - **International Civil Aviation Organisation (“ICAO”)**: a UN agency responsible for setting international civil aviation standards. Membership consists of the 193 signatories to the Chicago Convention.
  - **Multiple simultaneous operations (“MSO”)**: multiple uncrewed aircraft which are under collective control and are in flight simultaneously.
  - **Uncrewed aircraft system (“UAS”)**: uncrewed aircraft, together with any associated equipment.
  - **Uncrewed aircraft systems (UAS) traffic management (“UTM”)**: a specific aspect of air traffic management which manages unmanned aircraft system (UAS) operations safely, economically and efficiently through the provision of facilities and a seamless set of services in collaboration with all parties and involving airborne and ground-based functions.
  - **Uncrewed aircraft**: aircraft with no pilot on board, including remotely piloted and autonomous aircraft systems.
  - **Vertical take-off and landing aircraft (“VTOL”)**: a heavier-than-air aircraft, other than aeroplane or helicopter, capable of performing vertical procedures by means of more than two lift/thrust units and certified for use by one or more occupants.
-