

Project RESCUE

Use of drone technology for environmental emergencies in Somerset

OUTLINE BUSINESS CASE

Issue 1

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STRATEGIC CASE

Introduction and Background

Using drones to monitor environmental emergencies offers a range of advantages that make them highly effective tools in disaster response and environmental protection. They can be launched quickly and reach affected areas faster than ground teams, can access areas that are difficult or dangerous for humans, and keep emergency personnel out of harm's way during assessment phases, plus are far less expensive to operate and maintain than crewed aircraft and reduce the need for large response teams in the field. In addition, drones can transmit real-time footage to responders for quicker decision-making.

The **Resilience and Emergency Services Coordination Using Enabled-drones (RESCUE)** project aims to deliver a Somerset-based environmental monitoring and resilience service using drones. It brings together Somerset Council, local emergency services, resilience teams, and Government agencies, plus the CAA, and drone service providers, to develop a Minimum Viable Proposition (MVP) for adoption as a sustainable service in Somerset.

This project is important to the Somerset region as it has a history of flooding, causing damage and impact on the local economy and lives. In 2014, Somerset suffered unprecedented flooding. Whole villages were completely marooned, and hundreds of people had their homes swamped. The economic cost of the floods to Somerset was up to £147.5 million, with the South West region significantly affected. The Council estimated that the cost of flood damage exceeded £10 million. More than 14,000 hectares of agricultural land, used for grazing and crops, were underwater for 4 weeks. The floods affected over 600 houses and 17,000 acres of agricultural land. The damage to residential properties amounted to £16 million.

This was not a one-off event, another very wet winter in 2024 saw record rainfall in one of the lowest-lying areas of the UK, the Somerset Levels and Moors.

This document outlines the business case for the use of drones to collect data and intelligence during environmental emergencies in Somerset. This will include the environmental, social, and economic implications of flooding across the county, identifying drone-based solutions to support emergency response, and identify the economic growth opportunities the adoption of drone technologies and supporting services will have on the region.

Organisational overview

The Civil Contingencies Act 2004 provides the overarching framework for civil protection in the United Kingdom, setting out how the country prepares for and responds to emergencies that threaten human welfare, the environment, or national security. It adopts a broad definition of an emergency, encompassing events such as natural disasters, flooding, and acts of terrorism - anything capable of causing serious harm to people, property, or the environment. At its core, the Act is designed to ensure that those responsible for public safety work in a coordinated, structured, and resilient way.

A central feature of the Act is the establishment of Local Resilience Forums (LRFs), multi-agency partnerships formed along police force boundaries. These forums bring together organisations designated as Category 1 and Category 2 responders, alongside supporting agencies, to deliver the duties set out in the Act. The Avon & Somerset Local Resilience Forum (ASLRF), for example, covers the geographical area of Avon & Somerset Police. Its purpose is to ensure that statutory responsibilities under the Act are fulfilled both collectively and individually, fostering cooperation across agencies and strengthening preparedness at a local level.

The duties under the Civil Contingencies Act 2004 are both practical and preventative. Responders must assess the risk of emergencies occurring, produce and maintain emergency plans, and put in place robust business continuity arrangements. They are required to warn and inform the public, share information with other responders, and cooperate to ensure an effective and unified response. Somerset Council, as a Category 1 responder, must comply with all these duties and are additionally required to promote awareness of business continuity within their communities. Category 2 responders, while not subject to the full range of duties, are required to cooperate and share information in support of the wider resilience framework. To ensure the legislation remains fit for purpose, the Act is subject to review every five years; the most recent review, published in March 2022, concluded that the Act continues to meet its objectives while recommending improvements to further strengthen the system.

Risk assessment is a cornerstone of this framework. Responders are required to undertake regular assessments and maintain a Community Risk Register, identifying potential threats and setting out the measures in place to mitigate them. This ensures that planning is informed by an understanding of local vulnerabilities and that preparedness remains proportionate to the risks faced.

Within this broader legislative and operational landscape, Somerset Council plays a defined and significant role in managing flood risk. As the Lead Local Flood Authority, under the Flood and Water Management Act 2010 and the Flood Risk Regulations 2009, the Council is responsible for developing and implementing a strategy to address local flood risks. This includes flooding from surface water, ordinary watercourses - such as ditches, dykes, and streams - groundwater, lakes, and small reservoirs. The Environment Agency, by contrast, has a strategic overview of all flood risk matters across England and Wales and is responsible for flood risk from main rivers, large reservoirs, and the sea. Effective flood management therefore depends upon close partnership working between the Council and the Environment Agency, alongside Internal Drainage Boards, water companies, riparian owners, and Somerset Council Highways.

The Council's responsibilities are both strategic and operational. It must investigate all significant flooding incidents, maintain a register of flood defence assets, and act as a statutory consultee in the planning process for major developments in relation to surface water. It is also required to build and sustain partnerships to ensure effective collaboration between authorities with flood risk responsibilities. Under the Flood Risk Regulations, the Council must undertake specific statutory tasks, including completing a Preliminary Flood Risk Assessment and identifying areas of significant flood risk.

In times of emergency, the Somerset Council Emergency Response Team acts as the first point of contact within the Authority. The Council is engaged before an event, during the response phase,

and throughout recovery, until it formally steps back once recovery objectives have been met. In recent years, much of the operational response has centred on surface water flooding, reflecting the increasing frequency and intensity of such events.

Taken together, the Civil Contingencies Act 2004 and flood-specific legislation establish a clear, layered system of responsibility. They combine national oversight with local delivery, legal duties with partnership working, and planning with practical action - ensuring that communities are better prepared, better informed, and more resilient in the face of emergencies.

The Avon & Somerset Responders are summarised in the table below:

Category Responder	Agency
Avon & Somerset LRF Category 1 responders	Avon and Somerset Constabulary Avon Fire & Rescue Bath & North East Somerset Council Bath and North East Somerset, Swindon and Wiltshire NHS Bristol City Council Bristol, North Somerset and south Gloucestershire NHS British Transport Police Civil Nuclear Constabulary Devon & Somerset Fire & Rescue Service Environment Agency HM Coastguard NHS England NHS Somerset North Somerset Council NPAS Somerset Council South Gloucestershire Council South Western Ambulance Service UK Health Security Service
Avon & Somerset LRF Category 2 responders	Bristol Airport Bristol Water British Gas BT HSE Met Office Ministry of Defence National Grid National Highways Network Rail The Coal Authority Wessex Water
Avon & Somerset LRF Other and voluntary groups include	Avon & Somerset Search & Rescue Cliff Rescue British Red Cross Cruse Bereavement Care

Category Responder	Agency
	Freewheelers
	Lions
	Maritime Volunteer Service
	Military – RAF, Army, Royal Navy
	Rapid Relief Team
	RAYNET
	Samaritans
	Severn Ambulance
	Sky Watch
	St John Ambulance
	Street Pastors
	The Care Forum
	The Salvation Army
	Victim Support
	Wessex 4x4 Response

Business strategy and aims

The aim is not to manage floods directly, but to use drones to enhance the intelligence that underpins preparedness, response, and recovery. By deploying drones ahead of flood events, there is an opportunity to gather high-quality, up-to-date data that strengthens modelling, improves understanding of infrastructure vulnerability, and builds a clearer picture of risk across coastal, rural, and urban environments. This proactive approach is about foresight, equipping decision-makers with better evidence before an event occurs, rather than reacting once impacts are already being felt.

Pre-event deployment can support more accurate flood modelling by capturing detailed terrain, land use, and asset condition data. Coastal defences, riverbanks, culverts, highways, drainage systems, and other critical infrastructure can be assessed systematically, identifying weaknesses and maintenance needs before they become points of failure. The repeatability of automated drone missions allows for consistent monitoring over time, creating comparable datasets that strengthen trend analysis and long-term planning. In this way, drones become a tool not simply for observation, but for informed, risk-based decision-making.

Following a flood event, drones significantly enhance situational awareness. Their ability to be deployed instantly and to access areas that are difficult, unsafe, or inaccessible to people provides an immediate overview of affected areas. Real-time visuals can help locate stranded individuals, identify blocked routes, assess flood defences, and prioritise resources. This rapid intelligence supports first responders on the ground, guiding rescue efforts with current, accurate information while keeping emergency personnel out of harm's way.

Drones also play a critical role in the recovery phase. Post-flood damage assessments can be undertaken quickly and systematically, supporting infrastructure inspections and helping to identify hazards such as contamination risks or standing water that may contribute to disease. Their extended flight range and ability to conduct automated missions enable large areas to be

surveyed efficiently, providing comprehensive coverage that would otherwise require significant time and cost. Compared with crewed aircraft, drones are less expensive to operate and maintain, offering a scalable and sustainable capability for both routine monitoring and emergency deployment.

Beyond operational use, the intelligence gathered through drone deployment can inform the Somerset Rivers Authority (SRA) forward plan, shaping investment priorities and strengthening strategic direction. Integrating drone-derived data with other datasets - such as hydrological modelling, asset registers, satellite imagery, and ground-based observations - creates a richer, more connected evidence base. This integration ensures that insights are not isolated but embedded within wider flood risk management systems, supporting a more resilient, informed, and adaptive approach to managing flood risk over the long term.

Spending objectives

The Council's spending objectives are rooted in a commitment to achieving greater value, stronger collaboration, and long-term resilience for Somerset. At their heart is the principle of making more effective use of resources, ensuring that investment delivers measurable benefit, reduces duplication, and enhances the capacity of those already working to protect communities. This is not simply about acquiring drones capability, but about applying drones intelligently, efficiently, and in direct response to local need.

A key objective is to provide greater support to the Council team, strengthening operational capacity without placing additional strain on existing services. By equipping teams with improved tools and shared assets, such as drones, resources can be targeted where they are most needed, particularly during periods of greater demand. Enhanced situational awareness plays a central role in this approach, understanding where the worst-affected areas are, identifying priority sites, and gaining reliable intelligence for locations that are difficult to access, ensures that response efforts are both proportionate and timely.

Investment in drone technology and associated services represents a local solution to a local problem. Somerset's flood risk profile is distinctive - shaped by its coastline, rural landscape, river systems, and communities - and therefore requires drone solutions tailored to its geography and infrastructure. By embedding drone capability within the local area, knowledge remains close to the communities it serves, enabling faster deployment, better-informed decisions, and a stronger sense of ownership and accountability.

Collaboration is another defining objective. Greater partnership working across stakeholders - including the Council, the Environment Agency, emergency services, the LRF, and other agencies - ensures that capability is shared rather than siloed. Shared drone resources and services offer clear efficiencies. For example, organisations such as the Maritime and Coastguard Agency have successfully hired out services to partners including the Environment Agency, Border Force, and other search services. This delivery model promotes interoperability, maximises return on investment, and strengthens the collective response.

Ultimately, these spending objectives are about resilience, building a drone capacity not only to respond to flooding and other environmental emergencies (e.g. wildfires), but also to help recover

more quickly and reduce long-term impact. By improving intelligence, targeting resources effectively, and fostering collaborative working, the financial impact of flooding in Somerset can be reduced. Investment made upfront in preparedness and coordinated capability helps to limit costs associated with damage, disruption, and recovery.

Existing arrangements

In Somerset, nine out of ten environment emergencies within the county are related to flooding. This shapes both strategic priorities and operational responsibilities, placing flood risk management at the centre of local resilience planning and response arrangements.

As the lead Local Flood Authority for Somerset, the Council holds clear statutory duties under the Flood and Water Management Act 2010. In addition, it operates within the broader framework of coastal flood and risk management responsibilities, supported by agreed Terms of Reference that extend beyond business-as-usual activity. These responsibilities are embedded in legislation and require structured investigation, coordination, and transparency whenever significant flooding occurs.

Section 19 of the Flood and Water Management Act 2010 sets out the duty to investigate flood events. On becoming aware of a flood in its area, the council must investigate which risk management authorities have relevant flood risk management functions, and whether those authorities have exercised, or propose to exercise, those functions in response to the flood. Where such an investigation is undertaken, the council must publish the results. The decision to investigate is made on a case-by-case basis, taking into account factors such as the number of reported flooding incidents, the likely source of flooding, and the number of properties affected.

Section 19 reports typically provide background information about the location, a summary of the event, consideration of the likely causes, and clarification of the roles and responsibilities of each risk management authority, including actions taken or proposed. They also set out recommendations arising from the investigation. In Somerset, the outcomes of these investigations are published by the Council, ensuring that lessons identified are visible and accessible.

At present, data relating to flooding is drawn from a range of sources, including the Environment Agency, ground-based sensors, technical analysis, and ad hoc imagery. While this provides valuable information, it can be fragmented and dependent on availability. Within the region, police services operate drones and helicopters; however, drones have not been routinely used for flood response purposes. This presents both a gap and an opportunity, particularly in a county where flooding accounts for the overwhelming majority of environmental emergencies and where timely, accurate intelligence is critical to meeting statutory duties and protecting communities.

Business needs – current and future

Flooding in Somerset is no longer an occasional disruption; it is increasingly frequent, more severe, and less predictable. The experience of the 2014 floods remains a reminder of the scale of impact such events can have. The total cost to Somerset was estimated to be up to £147.5 million. More than 600 homes were affected, 17,000 acres of agricultural land were inundated, and damage to residential properties alone amounted to £16 million. The social, economic, and environmental

consequences were extreme - and they continue to shape how flood risk is understood across the county.

Over the coming decades, the UK's climate is expected to shift significantly, bringing warmer temperatures, wetter winters, drier summers, less snowfall, and rising sea levels. Somerset has already experienced a range of climate-related challenges, from repeated flooding to record-breaking heatwaves. Rising global temperatures are driving more frequent and intense extreme weather events - such as the 2025 Chard floods - placing growing pressure on communities, businesses, infrastructure, and the natural environment.

Climate change presents significant risks across multiple sectors. Buildings, utilities, and transport infrastructure are increasingly exposed to extreme weather. Businesses face operational disruption when sites are flooded, assets are damaged, or customers cannot access goods and services. Supply chains are vulnerable to developing impacts, where disruption in one area triggers consequences elsewhere. Productivity declines as working conditions deteriorate during extreme heat or severe weather events. In rural areas, crop damage and loss from flooding reduce yields and threaten food production. These risks are compounded in Somerset by an ageing population and areas of deprivation, which can heighten vulnerability and slow recovery. Recognising the urgency of these threats, the Council declared a climate emergency in 2019, acknowledging that climate change is one of the greatest challenges facing the county today.

Traditional approaches to flood risk assessment are increasingly struggling to keep pace with the scale and speed of change. They rely heavily on ground surveys and satellite imagery, both of which can lack the level of detail required for localised decision-making. They are often time-consuming, expensive, and resource-intensive, and may expose staff and responders to unnecessary safety risks. These limitations hinder effective emergency planning and weaken long-term resilience.

Drones offer a practical and forward-looking solution. They can deliver fast, safe, and intelligent flood monitoring and management, enabling agencies to respond swiftly and with greater precision. High-resolution aerial mapping supports low-cost rapid and accurate terrain modelling, improving floodplain analysis and informing natural flood management interventions. Real-time monitoring allows for immediate tracking of water levels and the potential for automated alerts, enhancing situational awareness and supporting timely decision-making. By identifying the worst-affected areas and providing intelligence for sites that are difficult to reach, drones can help ensure that resources are applied where they are most needed.

Beyond immediate response, drone technology strengthens predictive modelling by integrating historical data with real-time observations. Smart hydrological monitoring can support ongoing measurement of water levels, sediment movement, and soil moisture, contributing to a deeper understanding of catchment behaviour. Environmental impact analysis can assess the condition of ecosystems, informing strategic conservation and adaptation planning. In doing so, drones become more than an operational tool.

As Somerset adapts to a changing climate, the ability to collect accurate, timely, and locally relevant data will be critical. Drone capability offers a means to bridge the gap between traditional

assessment methods and the evolving nature of climate risk, helping to ensure that Somerset is better prepared, better informed, and better equipped to withstand future weather events.

Potential scope and service requirements

Throughout late 2025 and early 2026, the Project RESCUE team held a series of stakeholder engagement sessions with a wide array of organisations and partners, in order to understand the current approach to flood management in Somerset. Stakeholders included Somerset Council, the emergency services, national government agencies, academics, charities, and private companies. This is described in more detail in the Project RESCUE: Review of Service Provision Options report.

During stakeholder conversations, different use cases for tackling flooding using drones and remote sensing were identified. There was a wide variety of use cases identified: from monitoring traffic during flooding evacuations, through detecting contamination in flood waters, to surveying cliffs at risk of erosion. The table below shows the 10 use cases that were mentioned most frequently during stakeholder conversations, along with the total number of mentions for that use case.

Use Case	Stakeholder Mentions	Mission Type
Real time flood mapping	12	Area surveying
Infrastructure and asset inspection	10	Point inspection
Topography mapping of flow paths	7	Area surveying
Coastal surveying	7	Area surveying
Situational awareness / surveillance	7	Videos and images
Water flow monitoring	5	Area surveying
Property damage assessment	4	Videos and images
Corridor waterway mapping	3	Area surveying
Cliff and hill surveying	3	Point inspection
Bathometric surveying	3	Area surveying

While there is variation in these use cases, they can be grouped into broad categories by the type of drone mission that is required. Four categories of mission type were identified and are shown in the table:

- Area surveying (small areas) – flying over a defined area such as a field or river corridor to map it from above using different sensors such as photogrammetry or light detection and ranging (lidar)
- Area surveying (large areas) – flying over a larger region such as a coastline, river valley, or floodplain in order to map it from above
- Point inspection – flying close to a defined object or asset to inspect it for damage or wear and tear using videos and still images
- Videos and images – flying over an area or incident in order to provide a “bird’s eye view” of the situation and to capture videos and still images

These four categories of mission should be considered when comparing different service provision options for any proposed drone service for environmental monitoring in the region.

Main benefits and risks

The principal benefits of introducing drone capability lie in their ability to act as a “resource multiplier.” Rather than replacing existing functions, drones enhance and extend them - enabling faster data collection, broader coverage, and improved safety, all without increasing staffing or operational costs. In the context of flood monitoring and management, drones can deliver rapid, intelligent oversight, providing high-quality imagery and data that strengthens situational awareness and supports informed decision-making.

Drones can be deployed quickly and tasked to collect and share data in real time, enabling Somerset Council and agencies to respond with greater speed and precision. This immediacy supports not only emergency response, but also strategic coordination between stakeholders. When data is accessible and shared promptly, all partners – the council, local communities, the Environment Agency, emergency services, and infrastructure operators - can operate with a common operating picture. The potential for an integrated solution is significant. Drone footage can be mapped against Environment Agency datasets, creating a timeline of flood risk and event progression. By layering aerial imagery with hydrological and asset data, a more dynamic and evidence-based understanding of flood behaviour can be achieved.

However, realising these benefits depends on careful implementation. Experience elsewhere has shown that specialist equipment can become underutilised if not embedded properly within operational practice. Where pilots do not maintain currency flying or systems are not routinely deployed, investment risks becoming dormant capacity. This underlines the need for a clearly defined operating model, sustained usage, and measurable outputs to ensure value for money for the council.

There are also identifiable risks that must be managed. Scope creep is a particular concern. Without clearly defined tasks and governance arrangements, drone usage can expand beyond its original purpose, diluting focus and stretching resources. Establishing specific objectives, operational parameters, use cases, and accountability is therefore essential from the outset.

In addition, the Civil Aviation Authority (CAA) regulatory environment introduces constraints that must be fully understood and planned for. Airspace permissions, pilot accreditation, operational categories, privacy considerations, and safety requirements all influence where, when, and how drones can be used. These factors can affect immediacy, coverage, timeliness, and cost. Compliance must be built into the programme design to avoid delays or operational limitations at critical moments.

Finally, achieving a return on investment requires cultural as well as technical integration. The use of drones must be actively promoted within the council, embedded into standard operating procedures, and supported by training and awareness. Internal stakeholders need to understand not only how the technology works, but how it enhances their roles and responsibilities, and its limitations.

Drones offer substantial benefits as a resource multiplier - delivering faster intelligence, safer operations, and greater multi-stakeholder coordination. However, these advantages may only be

realised through clearly defined operating procedures, regulatory compliance, regular utilisation, and commitment by the council.

Reputation

For Somerset Council, the routine use of drones brings important reputational considerations alongside operational benefits. While drones can enhance flood, environment emergency response, and infrastructure monitoring, they are highly visible and often associated with surveillance, which can generate public concern if not handled transparently.

Privacy is a key issue. Even when deployed for legitimate purposes, drones may be perceived as intrusive. Clear communication about why they are being used, what data is collected, how it is stored, and who can access it is essential. Compliance with data protection and Civil Aviation Authority (CAA) regulations is both a legal requirement and a reputational safeguard.

There is also an expectation that public funds are used proportionately and effectively. If drone capability is underutilised, poorly governed, or seen as unnecessary, it may attract criticism. Defined use cases, strong oversight, and demonstrable outcomes help evidence value for money.

At the same time, there is reputational opportunity. When deployed responsibly, drones can demonstrate innovation, preparedness, and a clear commitment to community safety and climate resilience. The key is governance, transparency, and communication - ensuring that their use builds public trust rather than undermines it.

Constraints and dependencies

Local councils exploring the use of drones to monitor environmental emergencies - such as flooding, wildfires, or coastal erosion - face several important constraints and dependencies. A primary challenge is that many departments and organisations are already stretched in terms of both funding and workforce capacity. Budget pressures, rising service demands, and competing statutory obligations limit the ability to invest in new technologies, training, and ongoing maintenance. Drone programmes require not only the initial procurement of aircraft and sensors, but also certified pilots, data analysts, insurance coverage, and compliance with aviation and privacy regulations. In an environment where councils are balancing essential services, dedicating sustained funding and staff time to a drone capability can be difficult.

Regulatory and governance dependencies also present constraints. Councils must comply with national CAA rules, data protection legislation, and workplace health and safety obligations. The need to secure flight permissions, manage no-fly zones, and ensure appropriate data storage and cybersecurity standards can slow deployment during time-critical emergencies. Public perception and community trust are further dependencies. Concerns about surveillance, privacy, and data use must be proactively managed through clear communication and transparent governance frameworks.

Collaboration is both a necessity and a dependency. Effective drone deployment during environmental emergencies often requires coordination with emergency services, environmental protection agencies, national or other regional authorities, and sometimes private contractors.

Councils may not have in-house technical expertise and may rely on partnerships with neighbouring councils, shared service models, or commercial drone operators. Interoperability of data systems, agreed operating protocols, and pre-established memoranda of understanding are critical to ensure that drone-derived information can be rapidly shared and acted upon during incidents. However, establishing and maintaining these collaborative arrangements requires time, negotiation, and ongoing management.

In terms of service delivery, research and sector experience suggest that there is no “one size fits all” model. Somerset Council may benefit from developing an internal drone unit embedded within their emergency management team, particularly in high-risk areas prone to frequent environmental events. Or it may adopt a hybrid model, combining limited in-house capability with contracted specialist support during major incidents. If resource-constrained, Somerset Council may find that a shared regional service or on-demand external provider is more cost-effective. The optimal model depends on geographic risk profile, frequency of incidents, organisational maturity, and available funding. As such, Somerset Council must carefully assess their local context, risk exposure, and long-term sustainability before committing to a particular approach.

ECONOMIC CASE

The economic case aims to explore and identify the options which offer the best value to Somerset Council given its overarching objectives by evaluating costs, benefits, risks, and uncertainties.

Critical Success Factors

In order to assess options, a definition of what constitutes success needs to be established. As such, four Critical Success Factors have been defined with which to qualitatively assess options for adoption of drone technology within Somerset Council.

Critical Success Factor	Definition
Operational Effectiveness	Can the solution be rapidly deployed and provide 24/7 all-weather operation, how versatile are the payload options, how robust is the data pipeline (e.g. converting raw output from the drone into something useful to the council).
Compliance and Safety	How easily and robustly does the option meeting CAA-compliant operations, how sustainable is on-going training of pilots and maintenance of equipment.
Financial Value	Life-cycle affordability, measurable savings, avoided costs.
Organisational Value and Strategic Impact	Improvement in data quality and speed, cross-departmental enablement, improvement in resilience, alignment with climate adaptation goals.

Long-Listed Options

Various options of how Somerset Council could adopt drone technology are detailed below.

Option 1 – Fully Outsourced Service Model

External drone operators would be procured via a framework agreement or competitive tender process.

The external operators would be responsible for ownership, maintenance, and operation of any drone systems, as well as regulatory compliance and holding appropriate insurance. The framework agreement can be written to provide as much or as little flexibility as needed. For example, a “menu” of drone services could be agreed with set deliverables and prices detailed ahead of time. Alternatively, a clear and transparent system could be arranged for quoting for individual bespoke drone surveying tasks as needed.

Analysis conducted by the Project RESCUE team shows that indicative costs for drone services in the UK in 2026 are as shown in the table below.

Mission Description	Expected Cost
Area surveying using cameras	£85-£200 per hectare
Area surveying using lidar	£120-£300 per hectare
Other surveying and inspection tasks	£800-£1800 per day

The main benefits of this approach are: the Council will not need to recruit new staff or divert staff away from existing roles; the Council will not need to procure, maintain and store new drone equipment; and the Council can have access to the latest drone systems and data processing techniques through the external operators. The main drawbacks of this approach are: the costs of hiring external operators can become prohibitively high; and the complexity and cost of arranging external operators may mean that drone services do not get used.

Option 2 – Fully In-house capability

Drone equipment would be procured by the Council directly alongside training and maintenance contracts, with drone operations managed and conducted by Somerset Council staff.

The Council would appoint staff members to be drone operation specialists from within the organisation or by recruiting externally. The Council will need to appoint an Operations Manager, who is responsible for overseeing regulatory compliance for the Council and is nominated on Civil Aviation Authority (CAA) operation authorisations. Drone systems and the training to use them are widely available, and modern drone systems can be operated by anyone with a decent level of competence with technology and software.

Drone system costs range widely depending on size and complexity. The DJI Mavic 3E is a very capable drone system that would be suitable for inspection and small mapping tasks. It has a capital cost of around £3,000 at the time of writing. The DJI Matrice 350 RTK is a larger drone that is capable of carrying more sophisticated sensors and can operate in windier conditions. It has a capital cost of around £10,000 to £25,000 depending on the sensor, at the time of writing. The other main expense would be drone training and qualification for Council staff and support in writing and submitting an application for Operational Authorisation to the CAA. Training and application support costs are hard to estimate generally, but may run into tens or hundreds of thousands of pounds depending on complexity.

The main benefits of this approach are: the Council maintains direct control of the costs of drone operations; the Council will have flexibility to respond rapidly to emergency situations such as flooding; and Council staff will develop skills in surveying and data processing that can help in other areas of the Council's work. The main drawbacks of this approach are: the Council will need to hire new staff or divert staff away from existing roles; the Council will have to set up infrastructure for complying with drone regulations, training staff, and storing and maintaining drone systems; and there is a risk that, once qualified, Council staff may leave and seek employment with other drone service providers.

Option 3 – Hybrid model

In the option, the Council would establish a core in-house drone capability, which would then be complemented by a framework agreement or call-out arrangement with external drone operators to provide extra capacity or specialist services.

The Council would establish a drone operations capability within the organisation, but this would be limited to simple survey operations such as gathering images and videos, and would not cover complex operations such as mapping large areas or operating heavier and larger drone systems. This reduces the cost, regulatory compliance, and technical complexity of the drone operations

carried out by Council staff. When higher complexity drone operations are needed, they would be procured from an external drone operator.

The main benefits of this approach are: providing some element of rapid response and flexibility to the Council, and reducing the regulatory overhead to the Council of operating drones. The main drawbacks of this approach are: the Council will still have to redirect personnel to drone operations; there will still be some increased cost associated with external drone services.

Option 4 – Regional shared service

In this option the Council will collaborate with other agencies, public sector organisations and local authorities to fund and develop drone services which can then be used for a range of applications across the region.

There are a number of public sector bodies in and around Somerset that currently use or would have use for drone survey services. These bodies include: Somerset Council, Avon and Somerset Police, Devon and Somerset Fire and Rescue Service, Southwest Coastal Monitoring, Avon and Somerset Local Resilience Forum, and various local parish councils. A regional shared drone service could be arranged as an in-house capability hosted by one particular organisation (such as Somerset Council or Devon and Somerset Fire and Rescue Service) and used by other organisations under a shared support agreement, or organised as a shared “Somerset Drone Services” hub.

The main benefits of this approach are: developing a substantial range of drone capabilities that could be deployed in the Somerset region; and the cost of drone services being borne amongst a wider group of bodies. The main drawbacks of this approach are: the complexities in setting up this arrangement are very large; challenges in securing funding for services especially long term across multiple funding bodies; and developing a strategy for prioritising drone use by different bodies (for example prioritising emergency response use by the police over preventative flood management work by the Council).

Option 5 – Do minimum

The Council would publish ad-hoc tenders to external drone providers on an as-needed basis following generalised Council procurement processes. No internal processes to streamline drone-specific procurement would be developed, and every tender would be “from scratch”. The Council would develop no wider drone adoption strategy to guide decision making and approvals.

Option 6 - Business-as-Usual

The Council would establish no internal drone capability and would not enable a procurement process for drone use from external operators.

Indicative Costs

As part of the RESCUE project, an analysis was carried out of the different remote surveying options that are available on the market and their indicative costs. The analysis considered four types of remote surveying that could be used to monitor and mitigate flooding events, these were: drone systems, crewed aircraft, satellite data, and fixed sensors. The analysis found that for large

area surveying, either crewed aircraft or drones may provide the best service solution, but for all other applications only drones provide the required capabilities and flexibility at a relatively low cost. For more information, please see the Project RESCUE: Review of Service Provision Options report.

The table below gives indicative costs for the use of external drone service providers for the four mission types considered in this report (see page 10).

Type of Survey	Indicative Cost	Notes
Area surveying (small area of 10ha)	£850-£2750	Based on per hectare survey cost, costs vary depending on the sensor type and data processing requirements
Area surveying (large area of 100ha)	£6600-£20k	
Point inspection of flood management asset	£815-£1800	Based on a single day hire
Gathering videos and images of flooding	£815-£1800	

Potential Way Forward

In order to create a short list of options, each option was qualitatively assessed against a success criteria. A weighting to each success criteria was also assigned based on qualitative assessment of feedback during the stakeholder engagement portion of the RESCUE project. The scoring criteria and weighting for each option is given below.

Critical Success Factor	Weighting
Operational Effectiveness	30%
Compliance and Safety	15%
Financial Value	30%
Organisational Value and Strategic Impact	25%

Scoring criterion:

- 4 = Fully meets or exceeds
- 3 = Largely meets
- 2 = Partially meets
- 1 = Weakly meets
- 0 = Fails

Criteria	Option 1: Fully Outsourced	Option 2: Fully in-house	Option 3: Hybrid	Option 4: Regional shared service	Option 5: Do minimum	Option 6: Business-as-usual
Operational Effectiveness	4	3	4	3	2	1
Compliance and Safety	4	3	4	4	4	4

Financial Value	3	4	4	4	2	0
Organisational Value and Strategic Impact	4	3	4	2	1	0
Weighted Totals	3.7	3.3	4.0	3.2	2.1	0.9

Short-Listed Options

Based on the qualitative decision analysis the top three short listed options, in order to highest score are:

1. Hybrid
2. Fully outsourced
3. Fully in-house

Sensitivity Analysis

A basic sensitivity analysis was performed by manipulating two aspects of the scoring. First, altering the weighting to see how the results change.

- Baseline: 30% - 15% - 30% - 25%
- Even weighting: 25% - 25% - 25% - 25%
- Biased to Org. Value/Strategy: 25% - 15% - 25% - 35%
- Biased to Financial Value: 25% - 15% - 35% - 25%

Secondly, the criteria which were deemed the most uncertain given the highest range of scores (neglecting the BAU case) were re-assessed given a +/-1 point change in the scoring. In the case of the baseline case, the two criteria with the highest uncertainty were deemed to be Operational Effectiveness and Organisational Value and Strategic Impact.

Criterion	Option 1: Fully Outsourced	Option 2: Fully in-house	Option 3: Hybrid	Option 4: Regional shared service	Option 5: Do minimum	Option 6: Business-as-usual
Baseline	3.7	3.3	4.0	3.2	2.1	0.9
Even weighting	3.8	3.3	4.0	3.3	2.3	1.3
Bias to Org. Value/Strategy	3.8	3.3	4.0	3.1	2.0	0.9
Bias to Financial Value	3.7	3.4	4.0	3.3	2.1	0.9
+1 to point change from baseline	3.7	3.9	4.0	3.8	2.6	1.5

-1 point change from baseline	3.2	2.8	3.5	2.7	1.5	0.6
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The overall result from the sensitivity analysis shows that the down-selected options are not particularly sensitive to changes in the score weighting or adjustments in scores to the criteria considered higher uncertainty. The top three options, and their order, remain unchanged except in the +1 point case.

Benefits Appraisal

Primary quantifiable benefits of utilising drone services for management of flooding events:

- Avoided incident costs from faster detection of breaches/obstructions and earlier targeted interventions (e.g., sandbagging, pump deployment).
- Reduced traffic and economic disruption via earlier re-opening of transport links.
- Lower survey costs versus helicopters or repeated ground surveys.
- Productivity gains: fewer site revisits, improved targeting of on-site crews, reduced overtime.
- Evidence for funding and claims: high-quality imagery supporting disaster relief, insurance recoveries, or capital bid cases.

During any pilot or staged technology adoption the Council should consider creating a benefits realisation plan with specific metrics. These metrics should include measurable benefits such as: time to aerial assessment of a flooded area, number of hazardous access tasks avoided, cost per km² surveyed, days of road closure averted, number of times datasets or insights were shared across agencies and organisations.

Costs Appraisal

Primary costs that must be considered for utilising drone services for management of flooding events are:

- Initial up-front costs of drone equipment, personnel training, and regulatory compliance;
- Ongoing costs for equipment maintenance and repairs, liability insurance, continuity training;
- Procurement costs for sourcing external service providers;
- Service costs for hiring external service providers (these may be per day, per incident or per km² of area surveyed).

The use of drones to manage flooding events is a new initiative, utilising a relatively new technology. Any future procurement should clearly consider the budget and operational requirements for new services and capabilities, and it is recommended that a pre-market engagement is carried out to assess and control costs ahead of any formal procurement.

Risk Assessment

Risk	Description	Economic Impact	Mitigation
Regulatory/Permissions	Delays or limits on operations (e.g., weather, airspace constraints)	Reduced benefits if deployments curtailed	Early CAA engagement; conservative planning; contractor backup; mixed-fleet for wind/rain tolerance
Skills and Capacity	Pilot shortages; training attrition	Overtime or reduced coverage	Accredited training pipeline; cross-training; retainers with suppliers
Technology Obsolescence	Rapid change in platforms/sensors	Accelerated replacement cost, higher overall spend on capital assets than predicted	Lease or framework procurement; modular payloads; staged refresh
Data conversion and integration into organisation	Storage, processing into actionable insights, compatibility issues, uptake within organisational processes	Extra OPEX, benefits not fully realised	Plan for storage sizing; establish data standards, automate processing, training plan, internal communication and access to services plan
Public Acceptance	Privacy concerns, reputational risk	Operational constraints; communications cost	Clear privacy policy; community engagement; visible markings; audit logs
Utilisation Variability	Fewer flood events, access windows, or new disruptive non-drone based technology	Lower realised benefits	Scheduled innovation/new technology adoption review; use drones for other business areas

COMMERCIAL CASE

Procurement Strategy and Objectives

This Commercial Case sets out the proposed procurement strategy for the acquisition and/or commissioning of an aerial drone (UAS) capability to support Somerset Council's response to environmental emergencies and environmental monitoring activities. It demonstrates that the preferred option is commercially viable, compliant with procurement legislation, and capable of delivering value for money. The approach aligns with the Council's Contract Procedure Rules (CPRs), the Council's Standing Orders, and the Public Contracts Regulations 2015 (as amended).

The overarching commercial objectives are to secure a legally compliant procurement route and to achieve best value for money across the asset lifecycle. In doing so, the strategy seeks to ensure operational resilience and sufficient surge capacity, allocate risk appropriately between the Council and its supplier(s), and support wider social value and environmental sustainability objectives.

Options Appraisal (Commercial Delivery Model)

From the six delivery models described in the Economic Case, a review of comparable public sector organisations indicates that drone services are typically delivered through one of three principal commercial models.

Option 1 – Fully Outsourced Service Model

Under this model, external drone operators would be procured via a framework agreement or competitive tender process. The principal advantages of this approach include the avoidance of capital expenditure, access to specialist expertise and advanced equipment, and the transfer of a significant proportion of operational risk to the supplier.

However, this option carries potential disadvantages. Mobilisation delays may occur during widespread incidents, and availability risks may arise during periods of national emergency when demand is high. In addition, for services requiring frequent deployment, long-term revenue costs may exceed the cost of internal provision.

Option 2 – Fully In-House Capability

This model would involve procuring drone equipment directly, alongside training and maintenance contracts, with operations managed and flown by Somerset Council staff. The key advantages include immediate mobilisation capability, greater operational control, long-term cost efficiency where deployment is frequent, and strengthened internal data governance arrangements.

Conversely, this approach requires upfront capital investment and creates an ongoing training and compliance burden. There is also a risk associated with technological obsolescence over time.

Option 3 – Hybrid Model

The hybrid model would establish a core in-house rapid response capability, complemented by a compliant framework agreement or call-off arrangement to provide surge capacity and specialist

requirements. Under this arrangement, turnkey solutions could be commissioned for major emergencies, flooding events, and extreme weather incidents, while the Council's internal team would manage day-to-day operational requirements.

This blended approach offers enhanced operational resilience, reduces reliance on a single supplier, and provides a balanced solution between capital efficiency and flexibility. It supports continuity of service during concurrent or large-scale incidents and is considered capable of delivering best overall value for money.

Procurement Route

The procurement route should be determined by the aggregated contract value.

Where the total contract value falls below the relevant procurement thresholds, a competitive quotation process should be undertaken in accordance with the Council's Contract Procedure Rules. A minimum number of compliant bids should be obtained, evaluated using the Most Economically Advantageous Tender (MEAT) criteria, and supported by a documented audit trail.

Where the contract value exceeds the applicable threshold, procurement should be conducted using the Open or Restricted Procedure under the Public Contracts Regulations 2015, or via a call-off from a compliant public sector framework agreement.

In all cases, the procurement process should be conducted in accordance with the core principles of transparency, equal treatment, non-discrimination and proportionality. Where required, a compliant Contract Notice should be published and procurement timelines adhered to.

In addition, consistent with public procurement principles and local policy commitments, the procurement strategy should consider opportunities to promote SME participation, carbon reduction (including reduced emissions compared with helicopter deployment), local skills development, ethical supply chains, and proportionate social value commitments aligned to contract value.

Proposed Contract Structure

Equipment (In-House Component)

For any in-house capability, it is proposed that the Council would enter into a supply contract of three to five years' duration, supported by a maintenance and support agreement. The contract would include provision for training and accreditation, warranty and replacement arrangements, and account for associated costs including staffing, laboratory or storage facilities, and any dedicated land transport requirements.

Services (Framework / Surge Capacity)

For outsourced or surge capacity provision, a framework agreement of up to four years is proposed. This would include defined mobilisation response times and robust Service Level Agreements (SLAs), covering deployment times, data delivery standards, image resolution requirements, reporting obligations, and availability commitments.

Performance would be monitored against agreed Key Performance Indicators (KPIs), including service availability, response times, data accuracy and quality, incident reporting compliance, equipment availability, regulatory compliance, and any reputational considerations. Regular contract review meetings should be scheduled, and performance data retained for audit and assurance purposes.

Contracts should also include provisions for termination for convenience and default, clear data ownership clauses, defined data transfer arrangements, knowledge transfer requirements, and asset disposal provisions where applicable.

Financial and Commercial Considerations

Whole-Life Costing

Evaluation of options should be undertaken on a whole-life cost basis. This should include capital acquisition costs, maintenance and consumables, software licensing, training and accreditation, insurance, and asset replacement cycles.

Value for Money

The deployment of drone capability has the potential to reduce reliance on helicopter hire, third-party surveyors, manual inspection teams, and high-risk site access. In doing so, it enables faster situational assessment, reduces operational expenditure, lowers health and safety exposure, and improves recovery coordination.

Taken together, these benefits demonstrate the potential for the proposed procurement strategy to deliver both operational effectiveness and long-term commercial value for Somerset Council.

Risk allocation

Any contract(s) should allocate risk in accordance with best practice, for example:

Risk	Proposed Allocation
Equipment defect	Supplier (under warranty)
Regulatory compliance	Operator
Data breach	Party at fault
Insurance coverage	Supplier to maintain minimum levels
Force majeure/weather	Shared

Insurance requirements should include appropriate levels of public liability and professional indemnity cover.

Abbreviations

ASLRF	Avon & Somerset Local Resilience Forum
BAU	Business As Usual
BT	British Telecom
CAA	Civil Aviation Authority
CPR	Contract Procedure Rule
HSE	Health & Safety Executive
KPI	Key Performance Indicator
LRF	Local Resilience Forum
MEAT	Most Economically Advantageous Tender
MVP	Minimum Viable Proposition
NHS	National Health Service
NPAS	National Police Air Service
OPEX	Operational Expenditure
RESCUE	Resilience and Emergency Services Coordination Using Enabled-drones
SLA	Service Level Agreement
SRA	Somerset Rivers Authority
UAS	Uncrewed Air System
UK	United Kingdom

References

1. Contract Procedure Rules and Standing Orders For the Supply of Goods, Provision of Services and Execution of Works Made on 9 February 2022 under Section 135 of the Local Government Act 1972
2. The Public Contracts Regulations 2015,
<https://www.legislation.gov.uk/ukxi/2015/102/contents/made>