Heligan Group

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Spotlight

Autonomous Systems

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Contents

Introducing Heligan Group

Founded in 2015, Heligan Group is an investment bank providing investment and advice to technology businesses operating within the Defence, National Security, Crime Prevention, and Public Safety markets.

Our partners and staff are a unique combination of finance professionals and accomplished 'on-sector' specialists drawn from government, intelligence, military, and policing backgrounds. Our team is further supported by a globally renowned network of advisors and associates.

The emerging trend for governments to seek help from the private sector to drive innovation and capability development within our chosen markets offers unprecedented commercial opportunities for businesses in the UK and beyond. Our experience, insight, and networks equip us to support our advisory clients and portfolio companies unlike anyone else, identifying and capitalising on growth opportunities for our investors.

Heligan is a strongly value-driven organisation that prizes honesty, candour, and respect in all our dealings. We practice the utmost discretion, while our security clearances allow us to engage with clients on sensitive issues.

Heligan Strategic Insights (HSI) generates actionable intelligence to improve business outcomes for the Group and its clients. HSI regularly produces research – in the form of data-driven market intelligence reporting and expert consultancy in our sectors of specialism - for internal and external consumption using access to data and networks not readily available in the open market. This spotlight, co-authored by Will Ashford-Brown (Director, HSI) and Ben Addley (Head of Research, HSI), on 'autonomous systems' is the eighth HSI Spotlight report to be published into the wider market.

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Introduction

Autonomous systems continue to revolutionise our every-day lives, with the rapid pace of innovation of key enabling technologies driving new and exciting use cases across a wide range of sectors and domains. Autonomous platforms are being developed and employed in the land, air, and sea domains, as well as in space and cyberspace. Whilst they may sound like new technology, autonomous systems can, in fact, trace their roots back to the 19th century, but recent advancements in technologies such as AI, sensing, and robotics have enhanced their utility and led to their increasing integration into everyday life, fuelling recent hype.

In defining what they are, autonomous systems are capable of performing tasks or operations without, or with limited, human intervention. These systems are typically able to carry out traditionally human-centric processes such as perception (of their environment), decision making (often supported by artificial intelligence), and autonomous execution of corresponding actions. But the degree to which a system is autonomous can vary, from fully autonomous systems requiring no human oversight, to semi-autonomous systems that seek confirmation or guidance from a human operator at various stages of operation.

Global instability – from the conflicts of Russia-Ukraine, Israel-Iran, and India-Pakistan - is increasingly characterised by the use of autonomous systems, capable of inflicting both significant human suffering and strategic military advantage – they have fundamentally changed the character of conflict.

Their proliferation on the battlefields of the 21st century, which is delivering a plethora of testing data to developers, is accelerating their rapid development, ultimately quickening their commercial adoption in use cases outside of the military.

McKinsey research suggests that the autonomous vehicle transportation sector is due to generate between £220 billion to £305 billion in revenue by 2035, which is an eye-watering figure. In addition, some estimates put the autonomous aircraft market's growth at 27.8% CAGR from 2024 to 2030, demonstrating the high growth potential for the broader autonomous systems market in the coming years.

This 'investability' provides the genesis for this Spotlight publication, which will examine autonomous systems' rich history and expected growth. Importantly we will analyse the critical enabling technologies that will fuel this expansion into the future and will also delve into the current and future use cases of autonomous platforms across all domains – land, air, sea, space, and cyber. Our analysis will critically explore areas Heligan assesses will bring returns to those willing to invest in the technology.

What is certain, however, is that autonomous systems will continue to play a pivotal role in the military domain, remaining integral to the arsenals of technologically advanced forces. At the same time, it is our assertion that their utility in the civilian sector will broaden as mainstream adoption accelerates and diverse use cases emerge.

Executive summary

With the proliferation of autonomous systems not just in conflicts around the world, but also in our everyday lives, the sector is poised for significant global growth:

Autonomous systems now account for up to **80%** of battlefield losses in the Russia-Ukraine conflict.

Only **10%** of autonomous systems attacks are intercepted by Ukrainian soldiers.

In 2024 Ukraine manufactured **2.2 million** drones, with this figure expected to equate to **4.5 million** in 2025 and plans to boost it to **7 million** in 2026.

Estimated worldwide revenue generation from the autonomous vehicle transportation sector of **£220 billion - £305 billion**.

Autonomous aircraft market growth of **27.8%** CAGR from 2024 to 2030.

£140 million to be invested in advanced drone and counter-drone systems in UK Defence Innovation's inaugural year of operation.

7 game-changing technology areas redefining autonomous systems

- Positioning, navigation, & timing
- Environmental & hazard perception
- Communication tech
- Range
- AI
- Edge compute
- C-UAS tech

7 core investment principles Heligan evaluate when considering autonomous systems

- Dual-use
- Kinetic vs non-kinetic
- Leadership teams
- Government support
- Diversity of portfolio
- Adjacent sectors
- Ukraine as a centre of excellence

The air domain

Overview and definition

Uncrewed Aerial Systems (UAS) or Uncrewed Aerial Vehicles (UAV) are, by nature, autonomous systems that operate in the air domain. The distinction between the two terms being: UAVs refer to the physical aircraft itself, or the flying component; and UAS refers to the entire system required to operate the UAV, including component parts such as sensors, GPS, and ground control modules. Such platforms are not novel technology but have gained significant traction over the last few years with their proliferation in the Russia-Ukraine conflict where they have changed the character of conflict in the 21st century.

There are different UAV classification types that are based on size, weight, engine type, operating altitude, range, and endurance as well as other factors depending on geography. The classification category will to some extent define what the drone is best used for – larger, heavier, more powerful, with a longer endurance and the ability to carry heavy payloads will tend to indicate a drone designed for the military market, to put kinetic capability over an enemy quickly and with lethal force. The US' Reaper and the Iranian designed Shahed drones exemplify this category of UAV. On the other hand, being small, lightweight, nimble and with a payload capacity of 5kg-25kg suggest a UAV more suited to civilian applications or the hobbyist market, although such UAVs do also have use by militaries for mobile units focused on covert or surveillance operations.

The configuration of a UAV also varies significantly across the market with variants configured with fixed single wing, dual-wing, quadcopters, paragliders, solar-powered engines, motor engines, electric engines, as well as UAVs with metres-long wing spans, down to nano-copters the size of a dragonfly. And it is this design of propulsion that typically determines whether a UAV has the capability for VTOL (Vertical Take-Off and Landing) or CTOL (Conventional Take-Off and Landing) – which in turn determines how and where UAVs are operated.

History

In the past, war has undoubtedly driven innovation and in the case of UAVs, this is no different – the earliest recorded use of a UAV occurred on 22 August 1849. Austrian forces besieging Venice attempted to float over 200 incendiary balloons, each carrying a small explosive payload equipped with a timed fuse that was to be dropped from the balloon over the beleaguered city.

Use cases

There is huge demand from militaries all over the world that now consider UAV technology and capabilities a normal part of their war-fighting arsenal. On the battlefields of Eastern Europe, they are being used for intelligence, surveillance, & reconnaissance (ISR), targeting in support of long-range strikes and artillery, kinetic strikes, and countering UAVs themselves. Often when used in a kinetic strike capability they are configured as one-way effectors, or 'kamikaze' drones, which terminate themselves on a target.

Technological development, which has fuelled the utility of these platforms, has also significantly broadened their use case beyond military applications. In non-military uses, we see them used in urban planning, agricultural monitoring, crop control, forest fire watch, aerial photography, and utility companies use them to monitor pipelines and power cables. Imperial College London has also developed a 'dual robot' drone that can both fly through air and land on water to collect samples and monitor water quality.

In policing and surveillance, they are used to protect and monitor critical national infrastructure, as well as giving events venues the ability to gain better situational awareness of large crowds. These important capabilities simply weren't available ten years ago to law enforcement, intelligence agencies, or public safety bodies.

Case study - Operation Spider's Web

This was an audacious covert, long-range drone strike by Ukraine against Russian long-range aviation assets on 1 June, 2025. The attack targeted five airbases – Belaya, Dyagilevo, Ivanovo Severny, Olenya, and Ukrainka – marking the largest drone operation to date, deep inside Russian territory.

Catching the public's imagination, 117 Ukrainian-made first-person view (FPV) drones were launched remotely from hidden trucks discretely prepositioned close to their targets. According to Ukraine's SBU, 41 aircraft were struck, causing billions of dollars' worth of damage, but most importantly, the operation enhanced perceptions of Ukrainian operational sophistication.

Key takeaways

Huge advances in sensor technology, robotics, accurate positioning systems and lighter, longer-lasting power systems have all contributed to a reduction in price and size, whilst the appetite to use them has massively increased – we are now seeing the rapid democratisation of UAV technology. This appetite is being driven by a societal shift that is starting to come to terms with a world where artificial intelligence, machine learning, and machine-driven decision support systems are built into most of the things we rely on every day. Automation is everywhere and the automation of transporting payloads, whether that be drones carrying packages, quadcopters carrying cameras, or autonomous human transportation by air, is all feeding a 'mainstreaming' effect of the technology.

The land domain

Overview and definition

Land autonomous systems, more widely referred to as Uncrewed Ground Vehicles (UGV) in a military context and Autonomous Vehicles (AV) in a civil context, are any land-based platform or vehicle that operates without a human onboard. This definition therefore includes remotely controlled vehicles, however, advancements in AI, sensing, and robotics have driven the emergence of vehicles able to operate under even greater levels of autonomy, such as self-driving cars.

On top of this uncrewed and ground-based nature, UGVs are typically equipped with an array of sensors, to enable navigation and/or target acquisition (whether the UGV is remotely operated by a human or is fully autonomous), as well as equipment to allow it to communicate to an operator, ground station, or other systems (crewed or uncrewed). With a payload, such as weapons, robotic arms, or cargo, these systems are able to tackle a variety of use cases, as we'll explore.

History

As with many technological innovations of the 20th century, the UGV's genesis came about from a military need, and it can trace its roots back to the Second World War. In the 1940s, German military engineers developed one of the first known UGVs, with the conception of the Goliath Tracked Mine. This was a tethered remotely-controlled vehicle used to deliver an explosive payload to enemy targets. Since then, UGVs have been developed to tackle much broader problems in areas beyond defence, such as bomb disposal, transport, and logistics.

Use cases

In policing and emergency response, UGVs support search and rescue teams access dangerous, inaccessible environments after catastrophes such as earthquakes. When equipped with thermal imaging sensors, they can locate survivors in poor visibility, having greater sensitivity to signals of life than humans. In addition, they have been used in firefighting, the handling of hazardous materials, and have been employed for years by bomb disposal experts – all of these use cases capitalise on UGV's innate resilience to harsh environments and remove the need to put a human 'on the line.'

In the defence and national security arena we see the US and Russia developing autonomous ground combat vehicles, equipped with weaponry and AI-assisted targeting systems, which match the lethality of any crewed variant currently in service, at a fraction of the cost. We also see developing use cases in a variety of other tasks on the battlefield including casualty evacuation and supply delivery – all of which again aim to remove humans from harm's way.

Many of these defence applications are currently being developed and battle-tested on the frontlines of Ukraine, with an ecosystem of hundreds of innovative SMEs riding the wave of military investment in the country. The Brave1 cluster spearheads this ecosystem, supporting these SMEs in establishing customer relationships, accessing funding, and championing their cause to overseas investors.

The conflict in Eastern Europe, which is estimated to have cost hundreds of thousands of military and civilian lives, is driving the speed of development in UGVs, as is the boost in European sovereign defence spending, which will inevitably support the further roll-out of autonomous ground vehicle technology in civilian use cases.

From the perspective of civil applications, we've been hearing for years of the development of AVs – completely self-driving cars, which promise to revolutionise our lives – frequently hailed as being on the brink of commercialisation. Whilst traction has been slow in the UK, announcements in early 2026 indicate AV trials coming to UK roads from as early as Q3 2026, and AVs are already being extensively used in US cities such as LA and San Francisco to transport people from A to B.

Leading the way with this offering are firms like Waymo (owned by Alphabet, Google's parent company) with their 'robotaxis' increasingly being deployed to urban centres. Indeed, 2026 looks to be a pivotal year for robotaxis stateside.

Furthermore, we've seen the utility of AVs in logistics (Asda has commissioned a trial to autonomously deliver groceries to over 170,000 residents), agriculture (i.e. autonomous tractors), and infrastructure inspection. Tesla is also increasingly looking to transition from driver-assist features to full autonomy across its growing fleet.

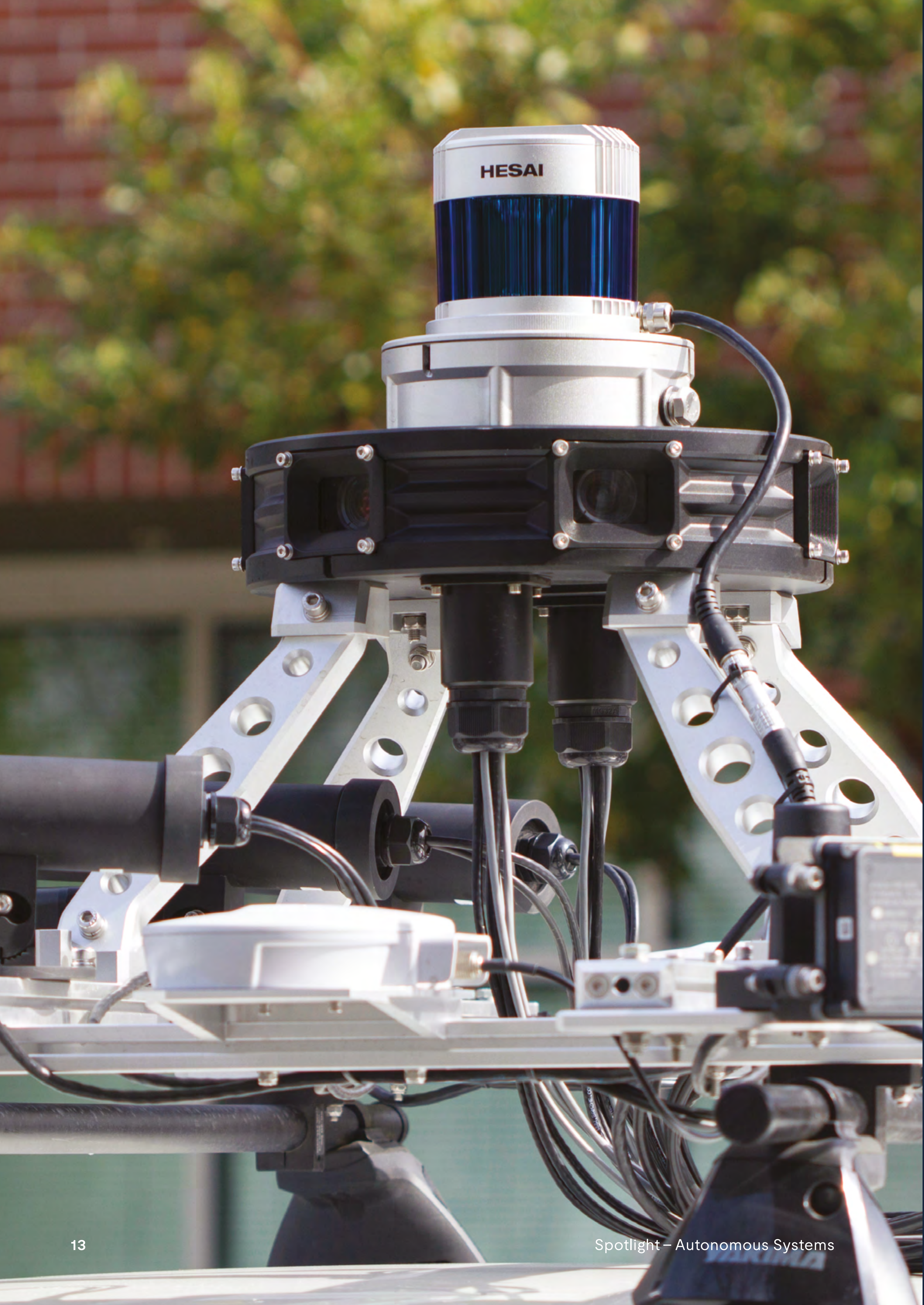
However, despite their popularity, civilian adoption en masse remains relatively limited, with trust in the technology often cited as a barrier to uptake. This is despite road collision data highlighting human error in 88% of all incidents.

Key takeaways

Land autonomous vehicles have a surprisingly long history, rooted in their military genesis. As key enabling technologies in AI, sensors, and communication links have matured, we have seen the emergence of highly sophisticated, autonomous systems with real-world civilian applications and the potential to revolutionise the way we live. Recognising this promise, the UK has invested heavily and sits at the forefront of UGV and AV development, which must be sustained in order for us to keep pace with our American counterparts and earn a seat at the 'regulatory development table.'

There is also no doubt that such systems will be used extensively in anger on the battlefields of the future, but civil applications will require the industry to overcome public concerns primarily centred around safety. From an investment standpoint, the growing sector, coupled with its connections into a flourishing defence industry, make it an attractive proposition. However, the dual use nature of UGVs presents complications around the potentially kinetic nature of such technology – a UGV used for humanitarian work could be repurposed with weaponry to undertake military operations.

These are critical questions that investment committees must address decisively – and without delay – or risk losing out on a potentially high-value opportunity.



Heligan Network insights: connected & automated mobility

Heligan Associate Network Member: Jim Campbell

Heligan Associate Network

The Heligan Associate Network provides Heligan and its partner organisations with unrivalled access to highly influential business leaders and subject matter experts across our sectors of focus: Defence, National Security, Crime Prevention, and Public Safety. Leveraging the knowledge base of this crucial network, we examine the UK Connected and Automated Mobility (UK CAM) initiative – its genesis and remit, the AV regulatory environment, and current keystone CAM projects underway worldwide. We provide an overview and the full UK CAM report can be found on our website.

UK CAM

Acknowledging that the UK has some way to go to rolling out fully autonomous AVs on British roads, the UK government, led by the Department for Transport (DfT), established the 'UK CAM Testbed' in 2017 – a consortia of CAM innovation and test facilities, geographically centred on the Birmingham-London corridor, including Oxford and Cambridge.

UK CAM brings together worldclass automotive proving grounds; leading CAM universities (Coventry, Warwick, Loughborough, Cambridge, and Cranfield); a consortium of technology companies (Jaguar Land Rover, Ford, AVL, and Costain); research institutes (the Transport Research Laboratory); local authorities; and facilitates cross-sector collaboration across industries such as infrastructure, automotive, autonomous driving, AI, robotics, telecommunications, IoT, insurance, legal, data analysis, and cyber security. All of this aims to position the UK as a leading player in AV development globally.

With a predicted AV manufacturing market value of upwards of £40 billion by 2035 and an industry supporting over 38,000 skilled jobs, the government has aligned £200 million to support UK CAM.

CAM regulatory environment

The leading CAM nations, including the UK, US, South Korea, Singapore, China and Germany, are engaged in a race to develop and commercialise CAM technologies. These nations, along with the European Commission, continue to collaborate in developing international CAM legislation, regulation, and standards. In the UK, the Automated Vehicles Act 2024 is a landmark piece of legislation designed to regulate the use of AVs on public roads. It marks a significant step towards integrating AVs into everyday life, with the potential to revolutionise transportation and enhance road safety.

Key aspects of it are:

1. **Safety standards.** Automated vehicles must meet rigorous safety checks and demonstrate a level of safety equivalent to or exceeding that of a competent human driver.
2. **Approval and licensing.** A new system for authorising and licensing AVs has been introduced, covering both fully autonomous vehicles and those with specific autonomous features.
3. **Liability frameworks.** The Act builds on previous legislation to clarify liability in accidents involving AVs, ensuring that insurers and manufacturers are held accountable where necessary.
4. **Economic impact.** The legislation is expected to unlock a £42 billion AV manufacturing industry, creating 38,000 skilled jobs by 2035.
5. **Road safety.** The Act paves the way for safe commercial use of AVs, which have the potential to reduce the human error which accounts for 88% of road collisions. Therefore, AVs are anticipated to significantly lower accident rates.

CAM future developments

1. **Deployment timeline.** Self-driving vehicles could be operational on UK roads as early as Q3 2026, following successful trials.
2. **Subsequent legislation.** The AV Act 2024 allows for the creation of additional regulations to address emerging challenges, such as data privacy, cybersecurity, and ethical considerations. Secondary legislation is currently under consultation, so we're sure to see changes and clarification to the law emerge.
3. **Global leadership.** The UK aims to position itself as a global leader in AV technology, with ongoing trials and significant investments in companies like Wayve.
4. **Public acceptance.** Future efforts will focus on building public trust and addressing concerns about safety, congestion, and job displacement.

CAM defence programmes

The US and Europe are at the forefront of developing CAM technologies, with numerous civilian projects underway aimed at revolutionising the transportation of goods and people. The full list of these initiatives are detailed in Heligan's full CAM report. In the defence realm, CAM is being driven by advancements in supporting technologies such as AI, robotics, and networked systems to enhance battlefield capabilities. Here we examine some of the leading defence-focused CAM programmes globally:

Europe

1. **GCAP/Tempest** – UK-led 6th generation fighter programme, including AI co-pilots and optionally crewed flight capabilities.
2. **Eurodrone** – European joint venture between Germany, France, Spain, and Italy developing a sovereign European MALE (Medium Altitude, Long Endurance) UAS designed for intelligence and strike missions.
3. **Future Combat Air System (FCAS)** – Multinational defence programme including France, Germany & Spain to develop a 'system of systems' incorporating a 6th generation fighter and interconnected remote carrier UAS platforms capable of swarming and supporting crewed aircraft.

US

1. **Loyal Wingman -** Focused on the development of Collaborative Combat Aircraft (CCA) for the US Air Force. CCA's are AI-piloted drones operating alongside piloted aircraft such as the F-35 and the Next-Generation Air Dominance (NGAD) platform. Boeing's MQ-28 "Ghost Bat" and Kratos' XQ-58A "Valkyrie" are key examples of prototypes in development.
2. **Robotic Combat Vehicle (RCV) & Optionally Manned Fighting Vehicle (OMFV) -** These programmes seek to develop autonomous ground vehicles for the US Army to support troops in combat.
3. **Sea Hunter -** A fully autonomous uncrewed surface vessel (USV), or warship, developed by DARPA to conduct anti-submarine warfare and reconnaissance missions.

China

1. **Loyal Wingman -** Leveraging China's FH-97 and GJ-11 UAS, this is China's response to the US CCA programme of the same name, developing AI-powered stealth drones.
2. **JARI USV (Orca) -** A small autonomous combat vessel capable of engaging surface and underwater threats.
3. **Sharp Sword & CH-7 Stealth UAV -** Autonomous drones designed for long-range surveillance and attack missions.

Russia

1. **Uran-9 & Marker Combat Robot -** Semi-autonomous UGVs equipped for combat with weapons and AI-assisted targeting.
2. **S-70 Okhotnik (Hunter) -** A UAV capable of autonomous stealth combat missions designed to work with Su-57 fighters.

Notable others

1. **Ghost Shark (Australia) -** A fully autonomous underwater drone for surveillance and anti-submarine warfare under development by Anduril.
2. **SWiFT (India) -** A fixed-wing drone prototype leading to the development of India's Ghatak stealth UAV.

Key takeaways

The interconnected nature of AVs and CAM technology poses cybersecurity challenges, and opportunities for cyber criminals, therefore the AVs of the future need to be 'secure by design,' which will require collaboration between the AV industry and cybersecurity sector.

Opportunities for the industry lie in the UK's leadership in key enabling technologies such as AI and space technology. The development of advanced AI will fuel advancements in hazard perception, and machine learning will make AVs more reliable in more complex environments, such as built-up urban areas.

Additionally, with AVs currently relying on reliable high-bandwidth, low-latency 5G networks – often the preserve of urban areas – to navigate and communicate with other vehicles, there will need to be a democratisation of space-based communication technology and integration with AVs. This will support the deployment of vehicles into more remote, less connected, regions.

Lastly, the next generation of sensors for AVs, such as LiDAR, with higher resolution, will enable more accurate motion prediction which will be crucial for high-speed, long-range hazard perception and collision avoidance.

It is our assessment that whilst the US leads the way, the UK is well-placed to work with international partners to develop international standards centred around safety, licensing, and liability (holding insurers and/or manufacturers accountable where necessary in incidents of collisions).

With self-driving vehicles touted to be operational on UK roads later this year, a number of opportunities and challenges lie ahead for fully autonomous AVs. At the top of UK CAM's agenda, we see challenges in enhancing the civil populace's appetite to adopt such technology. The government, through UK CAM, and private businesses operating in the AV sector, will need to work together to address these public concerns around safety, congestion and job displacement before we'll see large-scale uptake of autonomous AVs.

That said, CAM technologies continue to develop at an unprecedented pace, and coupled with government backing and investment, we're likely to see the UK take a leading role in the commercialisation of AVs in the next 12-18 months.

The sea domain

Overview and definition

Maritime Autonomous Systems (MAS) refer to uncrewed platforms that operate on or under the surface of the sea without an onboard human presence. These include Uncrewed Surface Vessels (USVs) and Uncrewed Underwater Vehicles (UUVs), each typically integrated with navigation systems, payloads, communications, and supporting infrastructure, much like their airborne and landborne counterparts. These platforms can range from small torpedo-sized underwater drones to full-sized vessels capable of months-long deployments. Control can be direct via remote operators, semi-autonomous, or fully autonomous with onboard AI and sensor systems.

History

The roots of maritime autonomy reach back as early as World War II, which saw navies experimenting with remotely controlled boats for minesweeping and target practice. In the Cold War era, the US and Soviet Union both developed underwater vehicles for intelligence gathering, some equipped with a degree of autonomy. However, it's only in the last decade that we've seen a real leap forward in terms of autonomy, endurance, and adoption – the Russia-Ukraine conflict is a strong example of this, with Ukrainian military operations frequently using USVs in the Black Sea to harass and sink Russian naval vessels. This campaign of using expendable USVs in swarms has ultimately resulted in Russia withdrawing its naval fleet from the sea around Crimea.

Use cases

Today, MAS are in active service around the world. Militaries use them for a whole range of activities such as mine clearance, anti-submarine and surface fleet warfare, ISR (intelligence, surveillance, and reconnaissance), and logistics support.

The UK has taken a leading position in maritime autonomy, with the Royal Navy actively developing and fielding a new generation of autonomous maritime platforms. Central to this effort are programmes like NavyX, the Royal Navy's autonomous systems accelerator, trialling platforms and working closely with NATO partners in joint experimentation to bring new innovation to the seas more quickly. The initiatives under NavyX (and other parts of the Navy and UK Special Forces) align with the Royal Navy's Maritime Aviation Transformation Strategy and the Strategic Defence Review's ambitions, and are seen as crucial to remain relevant in a world that is going to be dominated by one nation's ability to project power of this sort over others.

Scale-ups like Kraken Technology lead in this pioneering activity, developing next generation MAS capable of multirole operations, one-way kinetic operations, and can operate at ranges of up to 2000 nautical miles. These relatively inexpensive systems are leading to the development of maritime swarming concepts, emerging from the conflict in Ukraine, and further advances in propulsion and underwater communication are unlocking new opportunities.

Additionally, the Royal Navy recently accepted three sets of autonomous minesweeping systems, known as SWEEP, into service, enabling the safe clearance of sea lanes and ability to defeat modern mine threats remotely using uncrewed platforms.

In the commercial and civil world, MAS are transforming offshore energy, with platforms able to monitor, inspect, and repair subsea infrastructure and drilling rigs. Their loitering nature – the ability of an autonomous system to remain in a specific area for an extended period of time – allows them to conduct extensive environmental monitoring and collect oceanographic data in support of marine science.

Most exciting is the potential for MAS to transform maritime shipping and logistics, with countries such as Norway and Japan leading the way in the roll out of uncrewed cargo transport and smart port operations. Norway's MV Yara Birkeland is the world's first fully electric and autonomous container ship in commercial operation, demonstrating the benefits that MAS can bring in terms of cost reductions and enhanced personnel safety. Whilst this is a significant step forward in the use of autonomous systems in maritime shipping, we are yet to see regulatory sign-off for cross-ocean routes, which has the potential to significantly reduce operating costs for global logistics. MAS are also being used for underwater search and recovery, pollution mapping, and post-disaster infrastructure inspections.

Case study - Sub Sea Baby, a World's First

Late in 2025, Ukraine's ingenuity was once again on show to the World. This time Ukraine's Security Service (the SBU) struck a £300 million Improved Kilo II-class submarine docked in Novorossiysk, on the Black Sea. Ordinarily an attack on the Russian Navy in the Black Sea would not have been raised eyebrows, but what captured the imagination was in fact the tactic employed by the SBU, particularly in the context of recent moves by Russia to reposition the bulk of its naval assets eastwards, away from Crimea, in response to sustained Ukrainian pressure.

In this daring operation the SBU scored the first ever successful strike on a submarine using a UUV or Sub Sea Baby kamikaze maritime drone. Details are limited, but how the SBU were able to deploy, navigate to the target and detonate the payload will be of real interest – particularly whether the UUV was able to employ novel methods of communication underwater and autonomous navigation.

Key takeaways

MAS are no longer speculative technologies – they are operational realities reshaping both defence and commercial maritime domains. From uncrewed cargo vessels to naval swarms, MAS are enhancing safety, reducing costs, and enabling operations previously deemed too risky or impractical. While technological momentum is strong – driven by advances in AI, sensor fusion, and propulsion – regulatory frameworks lag behind and must evolve more rapidly to unlock their full potential, allowing MAS to safely operate in shared waters alongside crewed ships.

Nations like Norway and Japan are proving that coordinated innovation and policy can deliver real-world capability. Both nations have already conducted sea trials for autonomous commercial vessels, demonstrating that automated ferries and smart navigation systems are now more than just prototypes – they are real and operational. Therefore, as autonomy matures across the surface and subsurface domains, MAS will become a cornerstone of maritime strategy, logistics, and sustainability in the years ahead.

The space & cyberspace domains

Autonomous systems are not just confined to the land, sea, and air domains – but are now being developed and deployed across space and cyberspace. They leverage technologies – such as AI, machine learning, and robotics – that are already operational in autonomous systems in land, sea, and air. In the emerging space economy, autonomous systems support In-space Servicing, Assembly, & Manufacturing (ISAM) operations to conduct in-space maintenance, orbital adjustments and de-orbiting of satellites, and deep space exploration, to name a few. Over the past half a century, humans have become increasingly reliant on satellite-based services, such as global communications and positioning, which has placed a greater emphasis on the need for autonomy in space. In addition, with the very nature of space being the 'final frontier,' where very few humans have gone, the role played by autonomous systems in space has an even greater impact.

In the cyber domain, the evolving threat landscape – comprising increasingly sophisticated social engineering tactics, AI-assisted phishing operations, and challenges in securing the cloud and the network of our increasingly connected IoT devices – is requiring a step change in how we protect our critical assets in cyberspace. Autonomous systems are being deployed to predict, detect, respond, and mitigate cyber attacks, acting in real time with minimal human intervention. This ability to react to threats in real time is a game changer for cybersecurity and frees up Security Operations Centre personnel to deal with a much broader range of tasks and threats that continue to evolve.

Emerging autonomous systems technology

Behind all of these autonomous systems lies a sophisticated tech stack, supporting critical capabilities including positioning, navigation, hazard and environmental perception, range, and communication. Advancements in each of these capability areas – supported by developments in technologies such as AI, sensing, and edge computing – is enhancing the utility and lethality of military autonomous systems. On top of this, the increasing threat posed by autonomous systems is fuelling the growth of novel counter-UAS technology, being developed to protect personnel and critical national infrastructure.

Heligan provides analysis on the key technological developments that will shape the nature of future autonomous system capability in the next 18 months and beyond.

Positioning, Navigation, and Timing (PNT)

This remains a real challenge for traditionally GNSS (Global Navigation Satellite Systems) dependent autonomous systems, when faced with the reality of GPS-denied environments on the battlefields of the 21st century. But it's also worth noting that GPS-denied environments aren't just the preserve of modern warfare, but are inherent to environments such as warehouses, dense urban areas, and subterranean spaces. In overcoming these PNT challenges, a number of solutions are being developed, each utilising differing approaches to achieve accurate positioning without the support of traditional GNSS.

- **Inertial navigation systems –** an area being pioneered, capable of ascertaining positioning to the grid reference. These systems work by using motion sensors such as accelerometers and gyroscopes, combined with previously known positions, to calculate the trajectory and route of a moving autonomous system, ultimately placing it in the real world. However, inertial navigation remains subject to challenges such as measurement drift, which accumulates over time, resulting in potentially significant inaccuracies in positioning. This is a critical shortcoming when operating autonomous systems such as UAVs for military strike operations, where the risk of collateral damage is high.
- **Quantum inertial sensors –** although still a number of years away from commercialisation, this technology is now being developed to overcome the inaccuracies in positioning inherent to traditional inertial navigation systems. The technology relies on the phenomenon of 'atom interferometry,' which sees atoms behave like waves when cooled to near absolute zero. When the atoms are split by lasers, the fragments of the atom travel simultaneously along two paths, behaving like two waves interfering with each other, and are then recombined. Encoded in this pattern of interference is detailed information about how the atom's environment has affected its journey, including the smallest shifts in motion. The fact that atoms are identical in shape and behaviour, the opposite of mechanical components used in inertial navigation systems, means that positioning data is achievable with orders of magnitude higher accuracy. However, this technology has only just begun initial testing, so remains a few years away from operational use.

- **Computer vision –** when used in concert with physical environment modelling, is another recognised method of positioning currently under development. By combining data from an array of onboard sensors (i.e. optical, LiDAR, Radar), autonomous systems can infer their position based upon comparisons of captured images to models of their current operating environment. The performance of this positioning method is therefore dependent on the accuracy of the physical environment model as well as the effectiveness of AI visual recognition solutions, which continue to advance today.
- **eLORAN –** in removing the reliance of autonomous systems on US-operated technologies such as GPS, states are increasingly looking to deploy their own sovereign satellite constellations to support capabilities and systems requiring PNT. However, the relative weakness of signals originating from space means that they are highly susceptible to battlefield jamming. To contend with this challenge, a positioning system called eLORAN (enhanced Long Range Navigation) is proposed. Using a network of terrestrial transmitters, the system can triangulate the position of eLORAN-integrated platforms to a high degree of accuracy. Land-based transmitters ensure signal strengths remain high, mitigating the effects of jamming. The development of 'deployable eLORAN' solutions – capable of establishing localised PNT for expeditionary operations – presents opportunities for militaries engaged in GNSS-denied environments. However, with the technology still under development, eLORAN is not widely available, with the UK Government still in the early stages of exploring the rollout of such a network at home.
- **Doppler Velocity Loggers (DVL)** - Leveraging the 'Doppler effect,' DVLs – typically suited to UUVs – transmit sound waves from a moving vehicle towards the sea floor and measure the frequency shift of the reflected echoes. With the Doppler effect (i.e. the frequency shift due to the relative motion between wave source and receiver) directly proportional to the relative velocity of the vehicle and the sea floor, the speed and direction of the UUV can be calculated. The use of multiple transmitters and receivers, each emitting sound waves in multiple directions, can therefore be used to calculate the position of a UUV in the water column meaning that DVLs can be highly effective in navigating underwater autonomous systems.
- Other PNT solutions incorporate developing technologies such as **LiDAR** (Light Detection And Ranging) and **Ultra Wide Band** (UWB), which is specifically suited to short range positioning in indoor environments such as warehouses.

These solutions have the potential to support PNT in verticals such as logistics and transport (i.e. fleet management; warehouse operations), emergency services (i.e. navigation to incidents; subterranean operations), defence (i.e. UAVs and other autonomous systems operating in GNSS-denied environments), agri-tech (i.e. autonomous farm vehicle navigation in remote areas), space (i.e. orbit control), finance (i.e. high frequency transactions), and construction (i.e. surveying).

Environmental and hazard perception

In autonomous systems this is being significantly improved by advances in LiDAR technology, which transmits and receives pulses of light to build up a point cloud, or a map of its surroundings. This supports obstacle detection and avoidance, PNT, and importantly environmental perception. Traditionally expensive – early systems were £50,000+ per unit – and heavy, LiDAR solutions are now becoming much more affordable, light weight, and compact, allowing for improved integration into typically weight-constrained autonomous systems such as UAVs. Range and point cloud resolution improvements are also boosting their utility.

Communication technology

Developments in this area are improving the resilience of autonomous systems to electromagnetic effects, such as jamming, often a challenge to contend with on the modern-day battlefield. Ingenuity here is bred from the fact that until we reach full autonomous capability – and even then, systems operating in swarms will need to communicate with each other – platforms will require communication with human operators and base stations on the ground. Therefore, resilient communication is a must if militaries are to effectively operate autonomous systems in contested environments.

- **Smart frequency hopping –** a solution under development, which incorporates AI to understand hostile jamming signals in the environment and uses this information to change the autonomous systems' transmitting frequencies. The fact that jammers are unable to cover the full electromagnetic spectrum makes this method of resilient communications possible.
- **Directional antennas –** a technology that has been around for some time but is undergoing a renaissance thanks to their use in countering jamming. Directional antennas focus radio frequency energy in a specific direction, rather than broadcasting it equally in all directions. This can improve the 'signal to noise' ratio for an autonomous system's transmitter and receiver, helping it overcome the noise introduced by jamming. So, by pointing an antenna away from a jammer and toward the user's autonomous platform, the platform gets a stronger signal from the desired source and a weaker signal from the jammer.
- **Fibre optics –** fibre optically integrated autonomous systems have been pioneered in the Russia-Ukraine conflict to overcome jamming in the electromagnetic spectrum. UAVs tethered to a spool containing kilometres of fibre optic cabling, with ranges of up to 20km, are now common across the battlefields of Eastern Europe. Communications flow between the platform and operator through the fibre optic cabling, making them immune to the effects of jamming. However, this technology is not without its limitations, most notably range, but also there are reports suggesting that in the immediate aftermath of a drone strike, seized fibre optic cabling can allow troops to trace a light signal back to the operator's location.
- **Subsea –** the ability to effectively and freely communicate underwater is essential to protect our critical undersea infrastructure. Current methods use acoustic technology, as opposed to radio frequencies ubiquitously used in the air domain, but this is hamstrung by several issues: low data rates, susceptibility to fluctuations in the underwater environment, and vulnerability to variations in water temperature, salinity and refraction, particularly at depth. The proliferation of autonomous systems at sea and the growing threat to our subsea infrastructure is driving demand for solutions that allow end users to communicate data in real time, rather than current methodologies which harvest data at sea and require post-mission analysis, impeding the ability to action intelligence at speed. Various private and public initiatives are underway to innovate in this space: Newcastle University's USMART project (an underwater interconnected sensor net of low-power loitering sensors), AUKUS' 2025 Maritime Innovation Challenge, NATO's Allied Underwater Battlespace Mission Network challenge, Portugal's REPMUS exercises in the North Atlantic, and the Royal Navy's CABOT programme (digitisation of the North Atlantic, supported by autonomous surface and undersea platforms).

Range

The range of autonomous platforms, particularly smaller UAVs such as DJI drones, has long been a limiting factor, with operating duration typically constrained to less than an hour of flight time. Impeding greater mission duration has been the traditionally slow pace of battery development, though this is now being offset by significant improvements in battery capacity in recent years. On top of this, wireless charging, changing battery architectures, and power transfer technologies amongst UAVs are slowly being realised, enhancing the range at which military drones can penetrate behind enemy lines. Therefore, developments in power endurance stand to drastically enhance the lethality of military autonomous systems and utility of civilian platforms.

AI

Advancements in AI and machine learning have supported autonomous piloting in platforms such as UAVs which has been key in overcoming challenges in environments denied access to GNSS, required for navigation, and denied free use of the electromagnetic spectrum, required for autonomous system command and control. In a military context these advancements have also supported other emerging technologies, such as computer vision, where it has facilitated better target identification and significantly improved environmental perception. Evolving military tactics which employ UAVs and USVs in swarms of hundreds of systems, are playing a crucial role in overwhelming an enemy's defences. In the Russia-Ukraine conflict both sides use swarms of relatively inexpensive systems to relentlessly attack each other, which is proving much more effective than costly artillery and missile strikes. Underpinning swarming, and critical to the effective control of hundreds of autonomous systems, will be AI, which will enable a single human operator to control hundreds of systems in unison. We currently only see single operators handling tens of UAVs, so a real step change is expected here.

Edge compute

Whilst in the past decade AI has expanded considerably, the integration of this enhanced intelligence into autonomous systems has typically been held back by limitations in edge compute capability. That is the ability to ingest large quantities of data and run complex analysis 'at the edge' on the compute hardware of autonomous systems. Traditional hardware and software at the edge has typically struggled to carry out the analysis of vast data sets or run AI models locally, necessitating the transfer of data for analysis back to remote servers. However, critically for autonomous systems this inhibits ingestion, analysis, and action in real time, limiting the effectiveness of such systems. In addition, this transfer of data to remote servers or command posts for processing has also traditionally meant that autonomous systems have been susceptible to the effects of communications jamming. But what we're seeing now is the development of hardware and software to enable significantly improved edge compute capability in autonomous systems, allowing them to act with true autonomy and work on data in real time, which is enhancing their effectiveness in both military and civilian contexts.

Counter-autonomous systems technology

The mass adoption of autonomous system technology poses significant risks to civilians, deployed troops, and critical national infrastructure alike. Small, commercial off-the-shelf UAVs have famously disrupted civilian flight operations at some of the UK's busiest airports, and there have been UAV sightings over US military airbases in the UK. As a result of this, we're seeing rapid advancements in technology designed to protect people and assets from autonomous systems. These approaches range from kinetic solutions – missiles, interceptor drones, and drone nets – to non-kinetic solutions – directed energy lasers, microwave weapons, and electronic warfare jamming.

Our Technological Game Winners

Heligan assesses that while all seven key technology areas will significantly influence autonomous systems across land, sea, and air, advancements in PNT and edge compute are poised to have the most profound and far-reaching impact on the wider defence sector as their capabilities mature over the next 12–24 months.

In an era when autonomous systems reign supreme on the battlefield and states possess the ability to shut down GNSS services at a button's push, solutions to PNT in GNSS-denied environments will have a disproportionate impact on one sides' ability to inflict damage on the other.

Additionally, our view is that developments in PNT offer significant benefits far beyond autonomous systems, because PNT disruption affects far more than platform navigation. Reliable positioning and timing underpin a wide spectrum of critical functions – from military guidance systems to financial transactions and the synchronised operation of national power grids.

While eLORAN solutions are close to domestic rollout, the real step change will come from fully deployable PNT capabilities for expeditionary forces. Continued advances in physical environment modelling, the commercialisation of quantum inertial sensors, and the operational deployment of Doppler velocity loggers will be pivotal in enabling this transformation.

As we've highlighted, rapid advances in AI modelling have enabled far greater levels of autonomy across modern platforms. Yet this progress has been fundamentally constrained by limited edge-compute capacity – the ability of autonomous systems to process large sensor streams and run complex models on-board rather than relying on remote servers.

Emerging hardware and software solutions that accelerate and optimise AI processes such as inference – the process by which trained models analyse new data and generate real-time decisions – now have the potential to be genuinely transformative. As edge compute capability improves, autonomous systems will be able to make instantaneous decisions at the point of need, remain resilient in contested electromagnetic environments, enable much larger and more sophisticated swarming tactics, and strengthen the safety case for civilian AV applications.

Ultimately, these developments unlock the prospect of true autonomy not just on land, sea, and in the air, but also across space and cyberspace – a step change in how autonomous systems operate and deliver effect. This will be game winning for the field of autonomy.

Heligan's watch list

The businesses leading the way in PNT and edge compute innovation who we're most excited about.

- **Aquark** – backed by the NATO DIANA accelerator programme and the NATO Innovation Fund, Aquark specialise in miniatured, deployable quantum devices that provide PNT solutions.
- **Opertan** – a spin out from the University of Sheffield, the team at Opertan are developing a solution that allows machines to see, sense, navigate better than existing AI approaches. They hope to empower smaller, lighter, ultra-low power solutions that are more efficient and deployable at the edge.
- **Klepsydra** – already working alongside the European Space Agency, Klepsydra's goal is to deliver orders of magnitude lower latency and greater throughput in the computationally intensive AI process of inference.

Autonomous system M&A activity

M&A activity in the autonomous systems industry has been extensive in recent years across both the defence and commercial sectors – see Appendix I for Heligan's collation of the most significant acquisitions in the sector. In the defence sector, buyers have targeted technologies that strengthen uncrewed aerial, ground, and maritime capabilities, alongside autonomy-enabling software.

On the commercial and industrial side, activity has focused on applying autonomy across sectors including automotive, logistics, and energy. Acquirers are seen to be seeking platforms that can drive efficiencies at scale, from warehouse automation to autonomous haulage and inspection systems.

Across both defence and commercial markets, recent activity shows that acquirers are targeting companies with distinctive IP, platforms that are already field-proven, and technologies with clear growth potential. Large defence companies and industrial groups, which have capital, customer access, and integration pathways to scale are becoming increasingly active in this space.

In 2025 drone manufacturers made significant investments into the UK economy, with Portugal's Tekever announcing plans to set up a factory in Swindon, joining Stark and Munin Dynamics in the town. With competitor Flyby also voicing its intent to develop a presence there, Swindon looks poised to play host to a strategically important autonomous systems defence cluster in the years to come.

These regional defence and security clusters form a key pillar in the government's Defence Industrial Strategy, released in September 2025, as it looks to implement regional defence spending as vehicle for economic growth.

In addition, Ukrainian Ukrspecsystems and German Quantum Systems have both also committed to investing a combined £240 million in the UK, providing a strong endorsement of the UK's defence innovation capabilities.

Investment considerations

When assessing the investment potential of autonomous systems, Heligan's key indicators for success lie in seven critical factors:

1. Dual use

When evaluating products with both defence and civilian applications – such as autonomous systems – their 'dual use' nature can be particularly appealing to investors. Dual use broadens the markets beyond defence, in which manufacturers can sell. This is important as the defence industry has historically been plagued by heightened bureaucracy as well as lengthy and erratic procurement cycles. This has typically meant a highly concentrated customer base and delayed revenue generation for firms selling into the MOD, either directly or through 'systems integrators.' This has proven problematic for investors when appraising defence, but despite this, we are continuing to see a bifurcation of the sector into pure military plays (referred to as 'war tech') and pure civilian plays, with some civilian-focused businesses even straying towards military applications, although we don't see this happening in the other direction. Problems aside, defence is clearly becoming an increasingly attractive market, buoyed by a growing influx of private capital – helping to explain the sector's intensified focus on defence applications of autonomy. So, whilst the defence sector still grapples with a number of inherent challenges, evidence points towards it becoming much more commercially attractive in the long run. Therefore, firms with an active go-to-market strategy targeting not only the civilian market but, more importantly, the defence sector, will be better positioned to mitigate many of the risks associated with doing business with government and tap into the growth potential of defence.

2. Kinetic vs non-kinetic

This dual use nature of the technology also poses an ethical and moral conundrum – autonomous systems have proven their lethality on the battlefields of the Russia-Ukraine conflict, where they have been used to guide and deliver munitions or even acted as munitions themselves in the unrelenting 'kamikaze' drone strikes we see being carried out on a daily basis. Whilst the technology has real world civilian applications in sectors including logistics and transportation, the potentially destructive effect they possess cannot be overlooked. Therefore, this 'kinetic' nature of autonomous systems must be carefully evaluated when assessing autonomous system businesses for investment and should only be invested in by those comfortable with the potential uses of the technology.

3. Leadership teams

As in any firm, the success of a business is highly dependent on the quality of the leadership team. This is no different when assessing investments in autonomous system companies, however, entrepreneurs with strong military or public sector backgrounds are likely to have a clearer understanding of end user customer needs and be better equipped to navigate the complex defence procurement landscape, including the myriad of MOD frameworks required to sell directly into government. Additionally, leadership teams in possession of security clearances are essential and also pave the way for more in-depth commercial discussions with customers. Heligan is seeing a significant uptick in military personnel leaving service and moving directly into military-focused SME's, particularly in the autonomous sector, bringing with them direct and up-to-date military experience to this extremely fast-moving technology area.

4. Governmental support

Initiatives such as the Defence and Security Accelerator (DASA), the National Security Strategic Investment Fund (NSSIF), the NATO Innovation Fund (NIF), and America's In-Q-Tel support growing businesses through a range of mechanisms from grants to cash for equity. These businesses go through a rigorous tech and commercial due diligence process ensuring that they are some of the most promising companies of their cohort, de-risking their proposition. Those on the hunt for investments in defence should therefore take note of these government-backed firms.

Government tailwinds

Demonstrating its commitment to establishing the UK as a global leader in defence innovation, the government has pledged more than £140 million towards the development of advanced drone and counter-drone technologies during the inaugural year of UK Defence Innovation (UKDI). This substantial investment underscores the nation's strategic focus on autonomous systems and its ambition to drive technological progress in the sector.

5. Diversity of portfolio

For defence-focused investors, the autonomous systems sector is just one emerging area of defence technology which has the potential to revolutionise the character of warfare. Therefore, it would be prudent to invest across various defence tech subsectors to mitigate risk and maximise exposure to these emerging technologies.

6. Adjacent sectors

The autonomous systems manufacturing market remains highly saturated, with over £450 million invested since 2019 in UAVs, across 96 funding rounds, and drone startups amassing 70% of all defence and dual use funding in 2025, according to reports. In contrast, only £23 million has been invested in 'anti-drone' technologies representing a significant opportunity for investors. Heligan also assesses that in peacetime, whilst the demand for military UAS is likely to fall, the demand for counter-UAS solutions is likely to remain owing to the persistent threat to critical national infrastructure. However, integration challenges with such systems – typically consisting of various highly technical components required for detection, identification, and neutralisation – should be fully considered.

7. Ukraine as a centre of excellence

The Russia-Ukraine conflict has witnessed a substantial shift in the character of conflict – autonomous technology has emerged as a force multiplier, redefining the tempo and lethality of modern warfare. As a result, Ukraine is now home to a thriving ecosystem of hundreds of SMEs supporting the autonomous systems sector, the majority of which directly support the country's war effort. 'Battle testing' their products on the battlefield, in real combat scenarios, has allowed firms to develop highly capable platforms that rival the very best globally. In addition, the Ukrainian defence sector's shift to rapid innovation cycles of up to 24 hours, positions it as a growing powerhouse in autonomous technology, both today and into the future. Investors should therefore view the innovations arising from Ukraine's defence sector as key indicators of future trends, as well as look to forge connections with the ecosystem for access to some of the most exciting businesses shaping global autonomous system technology.

Final thoughts

The development of autonomous systems capability has been supercharged by global conflicts in the 21st century, particularly the war being fought in Eastern Europe between Russia and Ukraine. We've also seen these systems used in anger in the Middle East and Far East, with states responding to this changing character of conflict by investing heavily in autonomous capability at a time when global defence budgets have seen significant increases.

Aside from the three traditional domains of land, sea, and air, autonomy is also being developed at pace in space and cyberspace domains, as threats have evolved in these emerging frontiers.

Their proliferation across the battlefield is matched by a growing appetite from governments to harness this technology for their civil populace, with a range of programmes underway to utilise autonomous systems in goods and people transportation as well as search and rescue, surveying, and environmental monitoring.

Supporting the emergence of alternative use cases have been rapid developments in the technology stack that underpins autonomous systems. Novel solutions in PNT, sensing, edge compute, communication and AI integration are expanding the utility and effectiveness of these platforms in both military and civilian domains.

The popularity in autonomous systems is also driving sustained M&A activity, with a number of global players obtaining cutting-edge autonomous systems technology through strategic acquisitions in the past three years. Amid growing demand, Heligan's seven key investment considerations provide a clear guide for those aiming to successfully navigate and capitalise on the sector's expansion.

Overall, the outlook for autonomous systems is highly positive, with accelerating advances in underlying supporting technologies driving their integration across defence and commercial domains, positioning the technology as a critical enabler of future operational and economic advantage.

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Appendix I

Heligan has compiled a selection of the most significant global acquisitions in the autonomous systems domain over the past three years, covering AI, robotics, autonomous vehicles, and logistics targets operating across land, sea, and air. The active participation of major corporations in these transactions underscores the growing strategic importance of the autonomous systems sector.

nextracker onsight

Nextracker – OnSight Technology (July 2025, US)

Acquisition of robotics and AI firm focused on autonomous solar-site inspection and fire detection. Expands Nextracker's digital operations platform and accelerates adoption of robotics in renewable energy infrastructure.

gm general motors cruise

General Motors – Cruise (April 2025, US)

Acquisition secures advanced autonomous driving technology developed by Cruise. Reinforces GM's position in next-generation mobility and supports integration of autonomous vehicle capabilities into its wider automotive platform.

HEXAGON indurad

Hexagon – indurad (including xtonomy) (November 2024, US)

Purchase of radar-based industrial automation group and its autonomy spin-out xtonomy. Strengthens Hexagon's capabilities in autonomous haulage and positioning systems, advancing fully autonomous mining and heavy-industry operations.

BAE Systems – Malloy Aeronautics
(February 2024, UK)

Acquisition of British developer of heavy-lift electric drones (T-650 platform). Strengthens BAE's uncrewed aerial capabilities and logistics solutions.

Saab – BlueBear Systems Group
(August 2023, UK)

Purchase of UK AI-enabled swarming and autonomy specialist. Enhances Saab's position in multi-domain autonomy and AI-driven C2 systems.

AeroVironment – Tomahawk Robotics
(August 2023, US)

Acquired common controller technology enabling unified operation of air/ground uncrewed systems. Improves battlefield interoperability.

Ocado Group – 6 River Systems
(May 2023, UK)

Acquisition of warehouse robotics developer from Shopify at a discounted valuation. Adds autonomous mobile robot technology and a global customer base, broadening Ocado's logistics automation offering beyond grocery fulfilment.

EDGE Group – Milrem Robotics
(February 2023, Estonia)

Majority stake in leading European UGV manufacturer (THeMIS, Type-X). Largest foreign defence investment in Estonia, expanding terrestrial robotics.

Anduril – Dive Technologies
(February 2022, US)

Acquired large-scale autonomous underwater vehicle (AUV) start-up. Entry into maritime domain to complement air and land portfolios.

LDC – Eagle Eye Innovation
(February 2026, UK)

Provides capital to scale UAV-enabled monitoring of critical national infrastructure, supporting greater deployment of autonomous aerial inspection and surveillance capabilities across UK energy, transport and utilities assets.

Indra Group – GuardianUTM
(carve out from Altitude Angel)
(January 2026, UK)

Adds UAS traffic management (UTM) software capability, enabling safe integration of drones into controlled airspace. The deal strengthens Indra's digital air traffic management ecosystem and leadership in autonomous airspace infrastructure.

TermaA/S – OSL Technology
(November 2025, UK)

Adds advanced counter-UAS detection and mitigation technology to Terma's defence electronics portfolio, strengthening its position in integrated air and base protection. The acquisition expands Terma's C-UAS capability and access to UK and NATO security customers.

EOS – MARSS Group
(November 2025, UK)

Privides a kinetic counter-drone interceptor capability, complementing its remote weapon and defence systems portfolio. The transaction enhances EOS's offering in layered counter-UAS defence solutions for military and critical infrastructure customers.

Andreessen Horowitz – Shield AI
(May 2025, US)

$450m+ of investment supports scaling of AI pilots and autonomy software for military UAVs, particularly the Hivemind autonomy stack. The funding accelerates deployment of autonomous ISR and combat drones across US and allied defence programmes.

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