



HM Government

Space Industrial Plan

From ambition to action – advancing UK
Space Industry

March 2024

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Ministerial Foreword



Andrew Griffith MP, Minister of State (Minister for Science, Research, and Innovation) and James Cartlidge MP, Minister of State (Minister for Defence Procurement)

The UK's rich heritage as a world-leading space nation is not just a matter of pride, but the cornerstone of our ambition to drive economic growth on a global scale and to use space technology to improve lives and inspire future scientists and innovators.

Space offers a vast range of new opportunities, global broadband connecting otherwise unreachable areas, climate monitoring advancing our ability to tackle one of the greatest challenges facing the world, to 3D-printing organs in space reducing transplant waiting times and the risk of rejection.

We want to be a part of the exciting world that space can create, from the UK becoming a launch pad for polar orbit to manufacturing pharmaceuticals and printing organs in microgravity. By embracing the world space can create, we will improve lives.

From the way we communicate, to protecting our national interests, space technology is embedded in the fabric of our daily lives, and we need to harness the role of space in bolstering our productivity, driving investment, and strengthening our national resilience.

The UK space sector is incredibly valuable to the UK economy, employing 48,800 people, offering some of the most productive and skilled jobs in the country, with labour productivity 2.5 times the national average.¹ Global satellite services also underpin at least 18% of UK GDP (£370 billion), supporting everything from mapping to weather forecasting, to monitoring the power grid and enabling every single financial transaction, playing a vital yet often hidden role.

As we move deeper into a disruptive era of space technology and exploration, characterised by a new generation of space companies, solutions and an ever-diversifying international landscape, we need to rethink how government works with our industry partners. Government has delivered significant changes in how our objectives for space are delivered nationally. It is clear however that the next stage of our journey requires new ways of government and the private sector working together.

¹ know.space Size & Health of the UK Space Industry (2022)

This plan builds on our commitments from our National Space Strategy which laid robust foundations for the ambitious journey ahead to embed space as a fundamental driver of industrial growth and national resilience. We are prioritising activity out to 2030 with clear, timed missions and actions that we want to see backed and run by UK industry. This will only be deliverable through a shared endeavour, and we are offering our hand in that partnership.

The timing of this publication is critical. The sooner we set out our priorities to the sector, the faster we can align our efforts and allow the UK to both seize emerging opportunities and address the evolving threats of an ever more congested and contested domain. Space plays an integral role in supporting and enabling integrated deterrence in all other domains to respond to broader threats to the UK. The war in Ukraine and instability in the Middle East has served to reinforce the importance of space in civil resilience, securing information advantage and enhancing military operations. We will take an integrated approach that brings together all levers of state power, across government and with our Allies.

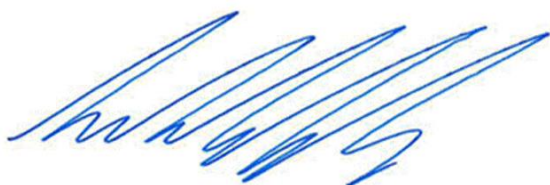
This publication coincides with a pivotal moment for how space activity is governed as we enter the planning for the next Spending Review, and beyond. This will be the first full cycle in which the National Space Strategy, the Department for Science Innovation and Technology Space Directorate and Ministry of Defence Space Command have all been in place from the start, giving us an opportunity to design and deliver programmes and funding effectively across government.

Space is aligned with wider ambitions of becoming a science and technology superpower by 2030, set out in the Science and Technology Framework. Space, a crucial element of our scientific landscape, is just as pivotal in advancing other deep tech sectors - such as Quantum and AI – as they will be key to unlocking advancements in space.

We recognise that this same opportunity is being pursued by a growing number of nations, tailoring their approaches to secure advantage. To maintain our competitiveness, our investments in space need to be targeted to go further. Government is prepared to act and spend where there are opportunities: for instance, the Connectivity in Low Earth Orbit (C-LEO) R&D programme that will build on the UK's established leadership in satellite communications. As this market shifts towards high-volume constellations, C-LEO will position the UK to maximise the commercial opportunities it offers.

International collaboration will continue to be a focus area as we set the scene for the growth of the UK's space sector. The UK will continue to build bilateral partnerships with like-minded space-faring nations, alongside bolstering existing relationships with the US, Five Eyes partners, the Combined Space Operations partner nations, wider NATO members, and as a proud founding member of the European Space Agency (ESA).

This plan is a commitment to our future in space. We are confident that the UK will continue to be a beacon of innovation, exploration, discovery, and growth in the boundless potential that space offers.



Creating a New Way of Working with the UK Space Industry

The National Space Strategy (2021) and Defence Space Strategy (2022) marked significant milestones for the UK Space Sector, outlining a shared vision beyond 2030, and setting out government's ambition for our space industry to take a leadership role on the global stage. We also set out delivery of these ambitions in the National Space Strategy in Action (2023) and redoubled our commitment to being a science and technology superpower in the publication of the Science and Technology Framework (2023)

Building on this foundation, the Space Industrial Plan establishes a prioritised approach to delivering the 'thrust phase' of the NSS out to 2030 as part of setting out our new way of working with the commercial space sector. This plan focuses on implementing pillars of the National Space Strategy, unlocking growth in the UK Space Sector, and developing resilient space capabilities and services.

Until now, our approach to R&D and regulation to support space industrial growth has generated a wide range of small, innovative companies.² We aim to move towards a system that nurtures key players of all sizes in the space industry. This plan is driven by our need to be more efficient in our use of resources, so we have set out a sequenced and prioritised plan of action to give industry and government confidence to invest long-term in the UK space sector. Alongside a commercially driven pull for R&D funding from industry, we want to send a strong demand signal in a targeted set of capabilities where we want the UK to excel. Industry can then proactively respond to clear government demand, creating a 'virtuous circle'³ for space in the UK, modernising the relationship between government and industry.

We want both a growing and increasingly resilient industrial ecosystem and recognise that critical industrial capabilities are a vital strategic asset. This enables our space industry to weather economic and geopolitical shocks – as it did during the Covid-19 pandemic⁴ – and ensures that the UK has access to critical capabilities which underpin our national security. In a more contested environment, this is indispensable to maintaining our operational independence and the UK's freedom of manoeuvre in space.

Through extensive workshops, dialogues with industry and collaboration across government we have built our understanding of what needs to change. This plan will focus on:

- Where we want to achieve UK leadership in specific capabilities and indicate where government expects a focus of resources across the space industry, and

² There are an estimated 1,590 UK-based organisations with space-related activities, 90% of which have an annual income of less than £5 million (Size & Health of the UK Space Industry 2022).

³ A successful 'virtuous circle' across the UK space industry would see the injection of public and private funding generate company growth and new technology development, which is commercialised in the UK for strategic advantage. The clear signal from government on its long-term priorities for the space sector gives companies the confidence to invest themselves in developing new technology, products and services. Government then works with industry to help increase export market share for those technologies, encouraging further reinvestment and beginning the cycle again.

⁴ The UK space sector saw a 5.1% growth in income during 2020-21 (Size and Health of the UK Space Industry 2022)

- How we intend to change the way we work with the space industry to achieve a shared vision and when we expect to see progress from our initiatives.

There are challenges facing UK space companies, and this plan meets industry's call to action with government commitments, and a plan that focuses on our relationship with commercial space companies and investors. The UK space sector builds on world-class research by our universities and academic institutions, with the sector's R&D intensity five times the UK average. Their role will remain vital, particularly as we seek to foster a 'research to operations to research' approach, unlocking new knowledge and developing cutting-edge solutions to stimulate the commercial cycle in the UK space ecosystem.

Our plan is based on a set of time-bound missions and actions to address these challenges. We define five national space capability goals to focus on first, a set of intervention areas describing how we will utilise our most effective levers to hone and shape the business environment and achieve our vision, and how we plan to use monitoring and evaluation to support effective implementation of this plan. We want to create an environment where science in the UK can thrive, so have also aligned the chapters of the document to the levers set out in the Science & Technology Framework.

We have already made funding available to deliver the initial actions set out in this document up to 2024/25. All future spending decisions will be subject to the normal spending review processes. This Plan will be critical in informing spending choices for the future.

Improving Delivery of our National Space Capabilities

We made clear commitments in the National Space Strategy to deliver national space capabilities, and they are crucial to achieving our UK long-term goals in space, wider national prosperity, security, and influence. We need to have a more directed approach to our interventions to ensure we deliver across government in a timely way and allow industry to align with our plans.

Vision: The UK has the full range of space capabilities⁵ that it needs to successfully deliver the National Space Strategy, securing UK leadership and strategic advantage globally. Government has domestic suppliers of critical elements needed for projects and infrastructures requiring elevated levels of assurance.

Our Missions to 2030 are to:

- **Deliver the first national space capability goals** to meet UK requirements through focussed and ambitious actions across government and industry.
- **Have clear, strategic sequenced plans to deliver all 22 space capability goals⁶** to enable coordination and planning, and effectively focus activity, funding, and investment.
- **Shape government interventions to create the environment for our domestic sector to deliver our capability goals.** We will signal our requirements early and brief the sector on space threats to enable them to respond.
- **Refine our Defence Highly Assured Technical Areas and work collaboratively to update industry as the technology evolves.**

Actions – initial new activity in 2024 to meet these missions will include:

- **Developing cross-government initiatives** to provide additional support, a more ambitious approach, or an accelerated plan in the short-term to deliver national space capability goals in five specific areas:
 - **Space Domain Awareness (SDA):** This would build on existing UK capabilities to deliver a world-class sensing and data management system for objects in space to effectively protect and manage UK-licensed spacecraft, establish a modern, high-capacity and innovation-friendly regulatory function that supports space sustainability goals and offers more accurate services to spacecraft operators. It would enable the UK to perform surveillance and tracking of spacecraft, underpinning the safety and security of the space domain. It would involve improved UK sensors on Earth and in space, and digital infrastructure to process and disseminate data.
 - **In-Orbit Servicing, Assembly and Manufacturing (IOSAM):** This would secure UK leadership in new, highly innovative global markets based on producing new materials and manufacturing in space, as well as new in-orbit services such as debris removal and refuelling satellites. It would involve delivery of an in-orbit

⁵ National space capabilities are a range of infrastructures which provide the UK with certain functions or services, whether to meet a government requirement or to create new market opportunities. Certain critical elements need to be UK-sourced for assurance.

⁶ As published in the National Space Strategy in Action (2022)

technology testing facility and a regulatory sandbox⁷ to develop the UK's core competencies for high-frequency, close-proximity operations, and help shape global design standards and regulations.

- **Space data for Earth applications:** This would deliver a new digital infrastructure to provide trusted insights from Earth Observation (EO) and Intelligence Surveillance Reconnaissance data, Space Weather monitoring and other sources to users, on demand, through a range of tools made widely accessible to serve sensitive and non-sensitive users (a national space data architecture). In line with DSIT's commitment to better leverage public data sets, while prioritising data privacy and consent. This improved access and utilisation would increase the exploitation of high-value satellite data across the economy. This will help realise the benefits of UK investments in space infrastructure, to deliver better and more efficient public services and create new commercial markets for products and services.
- **Position, Navigation and Timing (PNT):** The new national PNT policy framework includes development of a proposal for a new national space-based PNT augmentation system to provide UK high precision services. This will work alongside the National Timing Centre as part of the wider UK PNT framework. The Ministry of Defence (MOD) will develop a new 'MOD time' to provide a system of last resort to enhance national resilience. These developments of UK's capabilities will strengthen our capabilities and better position ourselves internationally.
- **Satellite Communication Technology:** This would involve development of a strategy and range of initiatives to secure UK leadership in commercial Satellite Communications for the next 10-15 years. The strategy would identify mechanisms to grow, retain and attract satellite communication companies in the UK to operate networks and innovate services to meet civil and defence needs and develop next generation technologies and capture global commercial opportunities. This will be linked into DSIT work on building UK capability in Future Telecoms, a priority set out in the Science & Technology Framework. We will set out our vision for growing the UK's future telecoms ecosystem, which includes Satellite Communications, this year.

These capability goals sequence our long-term ambition to 2030. We will seek to realise these objectives over time as technical delivery options develop and funding becomes available, which will be assessed through the normal spending review processes.

- **Completing a National Space Capability Development Plan** by the autumn. This will inform the delivery of all 22 national space capability goals to 2030 in collaboration with the UK sector and allow discussion with international partners. It will include:
 - A set of roadmaps for the delivery of all 22 national space capability goals,
 - A review of existing capability delivery programmes and mechanisms,
 - A capability management framework to coordinate delivery of the roadmaps.

⁷ Experimental approaches which offer supervised real-life or simulated test environments (digital or physical) where innovators can trial new products, services or business models, enhanced supervision from the regulator and with bespoke regulatory requirements.

- **Publishing an updated Defence Highly Assured Technical Areas**, to provide a clear signal of where government needs to preserve the option to procure onshore for national security and assurance reasons (Annex A).

Existing National Space Capabilities

The adoption of a more directed approach to provide additional support, greater ambition, or an accelerated plan for the delivery of our capability goals and Highly Assured Technical Areas responds directly to calls from the space sector for clarity to align with government planning. This does not de-prioritise existing programmes to deliver our capability goals, such as the Launch programme, Intelligence, Surveillance, and Reconnaissance concept (ISTARI), and Deep Space Advanced Radar Capability (DARC), which will detect, track, and identify objects in deep space. UK Space Command will continue to work with the UK Space Agency (UKSA) to establish an integrated military and civilian National Space Operations Centre (NSPOC).

We will also continue to focus delivery on our initiatives to develop space control capabilities, conduct space science and programmes such as the Vigil solar weather monitoring capability and UK exploration missions delivered through ESA, such as the Rosalind Franklin Mars rover.

We will continue to exploit these existing capability initiatives to the full. For example, the Launch Programme has enabled a market in the UK attracting inward investment, with the spaceports bringing launch operators to the UK. Rocket manufacturers like Orbex and Skyrora have established their headquarters in the UK, collectively employing around 150 people across the UK. We support these companies' ambitions to grow in the UK and export internationally to the extent possible to realise our capability goals and broader benefits.

Another example is the Skynet programme which will provide highly assured military satcom services to our Armed Forces, other government users and Allies. Key SKYNET procurements will deliver future Freedom of Action by building UK 'Technological Capital'⁸ and demand the growing of a UK skills base for design, software coding, system integration and testing, whilst investing in building critical UK industrial capabilities. This focus underpins both our current and future Operational Independence through promoting a vibrant UK industrial base with superiority in critical space technologies.

Future National Space Capabilities

Government will maintain a balanced portfolio of activities to deliver the full range of national space capability goals contained in the National Space Strategy, for example, by supporting R&D to prepare for capabilities or opportunities which are likely to become a focus for delivery in the future, for example on future energy, propulsion systems and new fuels, and discovery science missions.

International engagement is a core part of the National Space Strategy and will be integral to the delivery of our future national space capabilities. We will explore ways to deepen our policy, operations, and capability-focussed activities with the US along with other international partners bilaterally and through the Combined Space Operations (CSpO) initiative, NATO, European allies, and other like-minded powers. This will include targeted engagement and bilateral dialogues such as the UK-US Atlantic Declaration, the UK-Australia Space Bridge, and the UK-Republic of Korea Space Memorandum of Understanding in 2024/25.

⁸ A focus on people, skills, infrastructure, and advanced space technologies and manufacturing techniques, including associated intellectual property.

Transforming our Relationship with Industry

As we set the conditions for a competitive space industry, we must work together to create it. Achieving the UK's ambitions in space is not solely a matter for government, and nor can government's interventions deliver effectively without the support of industry.

Vision: The UK Government has established robust strategic relationships, and a shared vision with key players of all sizes in the space industry. This has led to unified and compelling activity that drives UK leadership in key capabilities, delivers our wider national strategic goals, and directly supports industrial growth. Through this, the UK has fostered a united front within its space industry and fortified its position on the international stage.

Our missions by 2030 are to:

- **Build a longer-term, mature relationship between government and the UK space industry** to maximise mutual benefits from company and government activity, investment, and development opportunities. Alongside others, we will ensure SMEs have a voice in to government policy development and activity.
- **Create the conditions for increased diversity and competitiveness of medium- and large-scale companies** to better balance the size distribution of space companies in the UK, ensure resilience and continued access to the capabilities and systems we need, and generate the most cost-effective choices for customers (including the public sector).
- **Foster a business development and scale-up support ecosystem for a complete journey of growth** through access to finance, procurement, and other enabling interventions.

Actions – initial new activity in 2024 to meet these missions will include:

- **Rolling out a new government strategic engagement model for key relationships across lead departments.** We will move towards building more strategic, two-way relationships with a longer-term focus through targeted engagement and information sharing.
- **Scoping pilots for new business development tools and approaches,** alongside the ESA Business Incubator, UKSA Accelerator and Unlocking Space for Investment programmes.
- **Embedding the Supplier Code of Conduct and space sector model behaviours across activity** in the sector to reflect our expectations for how businesses and government should act in the UK to deliver our goals. The sector should:
 - Develop stronger and more competitive space supply chains in the UK, leading to projects returning more benefits to UK industry and economy.
 - Tackle gaps identified through the space skills survey and action plan.
 - Expand regional development in line with regional growth policy and clusters.

- Focus on placing the sustainability of the orbital environment at the core of space activity, helping to ensure space remains sustainable, safe and accessible for future generations.
- Use and provide funding for UK R&D programmes, increase the level of R&D funded privately, and foster demand for UK Space products and services.
- Design business plans, roadmaps and programmes that support our national space capability goals and Highly Assured Technical Areas.
- **Designing a Defence Space ‘front door’ process** to enable better communication of Defence emerging needs to industry, and for industry to communicate new market developments and creative ideas the market may have for driving innovative capabilities in the Defence Space Sector.

Our Strategic Approach to the European Space Agency (ESA)

Our membership of the European Space Agency is critical if we are to achieve our national ambitions for space. Our ESA contributions account for approximately 70% of our national civil budget, so it is vital that we channel funding effectively to directly support our national strategic goals, including which national capabilities are best delivered through ESA participation. The UK is a valuable contributor to ESA, drawing on a wealth of sector expertise and skills. The UK sector is very well equipped to grow with ESA as it evolves and takes important steps towards greater commercialisation and entrepreneurialism.

To ensure that the UK gains ever more through ESA, a new approach will be developed to help realise the maximum benefit from the broad range of ESA programmes, strengthen the UK's position in ESA and provide confidence to the sector to aid long-term planning. We will:

- **Create a more coherent UK cross-government framework** that enables the UK to prioritise its own programme investment decisions clearly and robustly at future Councils of Ministers.
- **Influence the programmes that are developed by ESA** to align with UK competitive advantage, capability requirement and space science goals.
- **Provide a clear strategic timeline of priority areas of investment**, linked closely to the Capabilities Plan, spanning multiple Spending Review periods.
- **Assess the skills and facilities that the UK benefits from through ESA membership** to better evidence and inform policy decisions.
- **Maximise the benefit of the European Centre for Space Applications and Telecommunications (ECSAT)** based in Harwell, working closely with ESA as they explore possible future areas of focus for the site.
- **Facilitate greater collaboration with wider international partners beyond ESA member states.**

Enhancing the Regulatory Environment and Sustainable Practices for Space

Regulation has a critical role to play in incentivising sustainable practises, investment, innovation, and growth. It is a key lever for positioning the UK as a competitive nation. The UK has one of the most advanced space regulatory regimes in the world and we have taken a strong leadership role internationally, collaborating to develop standards, regulations, and norms of behaviour – and we want to go further.

Vision: The UK's regulatory regime is world-leading and an exemplar framework for safe, secure, and sustainable space. Our competitive and responsive regulatory environment enables innovation, provides transparency to promote growth and attract investment, and positions the UK to drive global standards for sustainable use of space with international partners.

Our Missions to 2030 are to:

- **Provide clarity and certainty on a set of prioritised improvements to our space regulations** to provide investors, developers, and operators the confidence to deliver their business in the UK and to promote novel, emerging technology, and growth.
- **Provide strategic prioritisation of space safety, national security, sustainability, and growth** in all space regulation initiatives and coordinate effectively with other regulatory processes.
- **Lead the development of international norms for a safe and sustainable space environment** by driving the agenda for change together with our international partners.
- **Set world-leading national standards in the UK for sustainable space operations through innovative regulatory policy.**

Actions – initial new activity in 2024 to meet these missions will include:

- **Publishing a Space Regulatory Review that will identify barriers faced by the UK's space sector**, including licensing, sustainability, data policies, novel activity regulations, and procurement practices. The report will make recommendations for overcoming these challenges and identify opportunities to ensure the UK remains competitive. Emerging findings have identified a number of areas for further consideration and potential development, including:
 - Streamlining the cross-regulator licensing process for orbital applications.
 - Improving cross-government coherence and integration.
 - Aligned sustainability and safety standards to regulatory/policy incentives.
 - Identifying possible financial tools to enable market access.
 - Developing innovative, agile approaches to rapid regulatory development.
 - Developing appropriate regulation to enhance our security and resilience, including in areas such as EO data security and spectrum filing management.

- Simplifying, amending, and combining legislation, where appropriate.
- **Launching the first industry-led sustainability standards for space and designing incentives for their adoption by industry.**
- **Working with the United Nations Office for Outer Space Affairs (UNOOSA) to implement Phase 4 of the Guidelines for the Long-term Sustainability of Outer Space**, through close collaboration with the UN Committee on the Peaceful Uses of Outer Space (UN COPUOS) and its member nations.
- **Ensuring effective orbital licensing for current and future EO capabilities.**
- **Delivering groundbreaking variable liability insurance and finance incentives, including variable liability limits, for responsible space operators** to reward sustainable practices and drive innovative approaches to sustainable space operations.
- **Supporting the intent of His Majesty King Charles III's initiatives in the Astra Carta**, which aims to convene the private sector in creating and accelerating sustainable practices across the global space industry. This is delivered by the Sustainable Markets Initiative and Government will act in accordance with its objectives to accelerate sustainable practices across the global space industry.

Boosting UK Investment and Access to Finance

Greater private capital into commercial space companies has led to rapid, disruptive changes in the sector and we see potential for that to grow. It is unlikely that the sector's ambitions will be fulfilled solely through government support – we want a greater flow of private capital into UK space companies.

Vision: The UK has built on its strength in attracting seed and early-stage funding to be a market with sufficient, effective growth and scale-up funding. The UK continues to lead on space investment in Europe and closes the gap to the US, with the UK and City of London becoming the pre-eminent global centre for space financial products and services.

Our Missions to 2030 are to:

- **Increase the UK's ability to attract, provide and sustain scale-up funding to space companies** to ensure access to the right kinds of finance, in the right timeframes and in sufficient volume to grow, stay and move to the UK.
- **Channel funding from national and global private investors into specific UK capability subsectors and companies** to streamline investment processes, increase and optimise the mix of public and private investment for achieving our national space capability goals.
- **Make space investments more mainstream in the UK** to unlock institutional investment by removing the perception that space investments are more unprofitable, capital intensive, and higher risk than other advanced sectors such as quantum, AI and biotech.

Actions – initial new activity in 2024 to meet these missions will include:

- **Implementing a new Private Investment Framework for Space**, enabling government to take a more strategic approach to attracting private investment into the UK space sector. It will assess the suitability of individual space capabilities for investment, and will assess different investors and their origins to encourage investment into specific parts of the sector. These decisions will also factor into government funding and support mechanisms to achieve the greatest balance of public and private investment in the sector.⁹
- **Delivering the new Unlocking Space for Investment programme.** Initiatives within the UKSA programme will improve SME access to early stage and growth capital. This includes changing investor perception on space, supporting companies to become investor ready, enabling more opportunities for collaboration between the investor ecosystem and space companies, and funding early space investment opportunities.
- **Encouraging and supporting the investment and space communities to host a global space finance conference in London in Autumn 2024**, to cement London as a global hotbed for space investment.

⁹ Sector intelligence and investor feedback will help inform these decisions. All the assessment will be undertaken in line with our international obligations and national legislation such as the National Security & Investment Act 2021.

- **Initiating a joint action plan with the finance and commercial space sectors to unlock London as the leading global space finance hub.** We will develop a single roadmap – cohering existing, and exploring new, government and industry activity – to clearly understand what scale of activity and investment is needed, by when, to meet capital market institution needs.
- **Assessing the use of more flexible, non-R&D funding vehicles** to ensure we have the right support available across the entirety of the sector.
- **Ensuring that cross-sector government initiatives and opportunities that support scaling up and financing of wider tech sectors consider specific requirements of space companies.**

Increasing the Adoption of UK Space Services

Some 40% of global private capital investment has been deployed in downstream spacecraft-derived data, applications, and services since 2015.¹⁰ However, space data and services often present a siloed and misunderstood technical offering, and potential markets remain untapped. We want to realise this demand and establish a full lifecycle from research to adoption.

Vision: UK space services, data and applications have become a commercial success across new and existing global markets. New business models – such as space data brokers and integrators – have allowed space to play a key role in emerging, priority technologies and tackle key future societal challenges. All companies can readily identify, adopt, and integrate space solutions, which have become a natural part of the conversation across all markets.

Our Missions to 2030 are to:

- **Deliver a greater uptake of space solutions through Strategic Suppliers and intermediaries** to stimulate the unearthing of, and access to, more commercial opportunities and further accelerate the use of space solutions.
- **Communicate the impact that space data and technology can have in other sectors and promote its uptake**, using language that end-users can understand to generate a clear value proposition across all potential markets.
- **Work with industry to identify opportunities for space to meet challenges across UK Government's five critical technology areas¹¹** to capitalise from strategic advantage in emerging technologies and leverage existing public investment.
- **Stimulate commercial innovation and the creation of new business models** to understand public sector requirements, aggregate demand and streamline procurement. This will increase collaboration between suppliers, end-users, and the R&D community, bridging the gap between space and wider industries.

Actions – initial new activity in 2024 to meet these missions will include:

- **Delivering a £2m Small Business Research Initiative by August 2024** to fund feasibility studies that combine terrestrial technologies with satellite data and services, tackling key challenges from private sector non-space organisations.
- **Work with government's Strategic Suppliers to unlock innovative space solutions**, link them up with SMEs and support them in becoming greater users of space in delivering public contracts.
- **Establishing a set of actions to drive demand for EO data across the public sector**: coordinating its innovative use throughout government and enhancing data-driven and effective decision-making.

¹⁰ PWC analysis of space sector investments since 2015 suggests that around 40% of private capital investment has been deployed in global downstream spacecraft-derived data, applications, and services.

¹¹ The Science and Technology Framework identifies 5 technologies most critical to the UK: AI; Engineering Biology; Future Telecommunications; Semiconductors; Quantum Technologies

- **Publishing findings from the Geospatial Commission commercial EO data pilot**, covering how the public sector's access to and innovative use of EO data can be supported to improve public services.
- **Promoting open access and collaborative use of space data across sectors** to unlock more in sights and draw the connection between space data, geospatial technology,¹² and the broader data ecosystem, including through exploring participation in data hackathons.
- **Exploring opportunities for jointly run funding calls** – partnering across other sectors within government and internationally – that can be leveraged by industry to advance cross-cutting technology and drive space into new markets.
- **Completing the UK's new EO data hub by April 2025** as a pathfinder project towards a potential national space data architecture, streamlining data access for government, industry, and academia. The hub will host national and international datasets, including those developed by the EO Climate Information Service.

¹² UK Geospatial Strategy (2030)

Improving Government Space Procurement

Government space procurement is today decentralised, with a limited awareness of opportunities across departments. As the sector grows, we see government's use of space solutions growing with it and want our space procurement to meet the evolving needs of both UK Government and companies.

Vision: Government has upskilled itself to be a more intelligent customer for space technology with a more appropriate, well informed risk appetite for procuring innovative space services. Government has streamlined the defence and civil space procurement interface with suppliers, providing companies with improved opportunities to secure government contracts and leading to a greater uptake of space services.

Our Missions to 2030 are to:

- **Improve coherence and efficiency of all government space procurement** to increase awareness, access, and ease for both suppliers and public bodies. We want government to procure more services, more easily.
- **Design and deliver our civil space programmes using the most appropriate delivery mechanisms** to give government the flexibility to deploy the most impactful financial lever we can, maximising the strategic value of each project. This will increase the effectiveness of our spend and provide companies the best opportunity to grow and attract investment.
- **Increase pace, flexibility, and agility of secure defence acquisition** to meet and react to current and future threats and challenges, maximising opportunities and deliver operational capabilities early. MOD is driving acquisition reform to increase the pace of delivery of military capability. This is to ensure we can respond to current and future threats and challenges through the MOD's new Integrated Procurement Model announced on 28 February 2024.

Actions – initial new activity in 2024 to meet these missions will include:

- **Crown Commercial Service (CCS) will jointly develop government's route to market for space with Defence, Equipment and Support (DES).** The adoption of a multi-supplier model will exploit the flexibilities under the new Procurement Act 2023, refresh the current CCS Dynamic Purchasing System¹³, and incorporate the aims and principles of the previously announced Defence Space Capability Framework. The model will champion pace and flexibility to accelerate procurement. Implementation is planned for April 2025. DES and CCS are working together to agree this approach.
- **Tailoring cross-government delivery mechanisms to better align with space industry needs and creating a UKSA commercial toolkit.** We will set out the range of uses of R&D funding and identify where we can better utilise existing R&D levers to ensure the most effective programme design across our civil space budget (such as greater use of the Small Business Research Initiative and wider UKRI levers).

¹³ RM6235: Space-Enabled and Geospatial Services

- **Delivering a new series of CCS-led workshops, customer days, use cases and newsletters** aimed at ensuring public bodies are aware of, understand, and can access the opportunities offered by space services.
- **Introducing the principles of the MOD SKYNET Integrated Enterprise Solution (SKIES) for the acquisition of military hardened and civilian Satellite Communication Equipment and Services.** The intent is that SKIES will work with industry to enable the SKYNET programme to be more agile and iterative, adopting more commercial practices and freedoms. Defence will seek progressive improvements made over years, rather than large single-event changes.

Building a Skilled Space Workforce

Challenges in recruiting, training, and retaining a workforce are clearly documented within the sector¹⁴, shared with many other science and technology-focused sectors. Government, industry, and academia are already taking action, and delivering these missions will only be achieved with collaboration. Delivery of the UK's national space capability goals are dependent on a steady supply of talent at all career stages.

Vision: The UK has a skilled, diverse space workforce capable of delivering fully on national space strategy goals, capabilities and supporting sector growth. Government, industry, and academia are well-coordinated in delivering a consistent, growing pipeline of talent across the UK, capable of reacting to changing needs, risks, and opportunities over time. Progress against the missions below can be clearly measured and reported upon.

Our missions to 2030 are to:

- **Grow the overall space sector workforce**, building on wider national efforts to strengthen our Science and Technology workforce, and developing the skills and experience needed for more specialised space careers.
- **Support the sector to address recruitment and retention challenges**, ensuring there are sufficient visible and accessible routes into attractive, rewarding career pathways for people of all skillsets, backgrounds and experience levels.
- **Increase access to high-quality, accessible, space training** that is responsive to the changing needs of the sector and individuals within it, ensuring everyone (inside and outside of the space sector) can upskill or retrain throughout their career.
- **Expand opportunities for participation in the space sector**, engaging with people from underrepresented groups across the UK, to encourage future careers in space and ensure a more diverse range of people enter the space workforce.
- **Grow an expert, dynamic and innovative space workforce within government** capable of delivering on the ambitions in the National and Defence Space Strategies.

Actions – initial new activity in 2024 to meet these missions will include:

- **Publishing a cross-government Space Workforce Action Plan**, building on the findings of the published space skills survey, sector inputs, and workshops via the Space Partnership. This will be focused on clarifying the barriers to growth, and actions to take forwards collectively. Ensuring actions and their impacts can be measured will be essential, e.g. via the biennial Space Sector Skills Survey funded by UKSA.
- **Using the new MOD Space Competency Framework to design a Space Professional Training Pathway for military service personnel**. The Framework and Training Pathway will act as a key enabler to support recruitment, upskilling, and retention by allowing MOD Space Professionals to build their skills and knowledge, plotting a career path within the space domain.
- **Completing Phase 1 of the physical build of the new Space Academy**, expected by mid-2025.

¹⁴ Space Sector Skills Survey (2023)

Stimulating International Trade

Services offered by the UK space sector are in high demand overseas. Exports from the UK account for 34% of the sector's total income, with at least £11.7 billion in inward investment secured over the past decade. The space sector is global by nature and as we support industry to expand further, the UK needs to be even more globally facing.

Vision: A globally competitive UK space sector that has built on our strong export market through a targeted 'invest to export' approach. Prompt, tailored government support has enabled UK-based companies to access new commercial opportunities overseas. UK space companies serve the rapidly growing overseas markets, enabling the UK to secure new global market share.

Our Missions to 2030 are to:

- **Focus investors and companies on the global export potential of their products as part of a wider 'invest to export' approach.** This will help companies build up resilience through international commercial opportunities, supported by government contracts and domestic demand.
- **Capture sizable commercial opportunities overseas in line with our capability goals.** Supporting companies to develop the necessary technology to win contracts to improve and promote a resilient and more internally competitive sector.
- **Build shared economic security with allies and other advanced spacefaring nations** through sustained bilateral and multilateral dialogues to secure and promote the UK as an assured partner capable of providing commercial solutions and supply chain partners.
- **Consider exportability and strengthening our relationship with industry as key priorities in Government defence procurement processes** and the delivery of priority co-ordinated export campaigns.

Actions – initial new activity in 2024 to meet these missions will include:

- **Increasing commercial space sector use of UK Export Finance-backed support** to facilitate and stimulate international investment.
- **Identifying export opportunities overseas for UK companies through DBT and UK Defence and Security Exports (DSE);** supporting industry to win export opportunities via establishment of a formal Government-to-Government contract offering and focussed (joint government and industry-led) Integrated Campaign Teams; and by working with companies on strategic supply chain planning, providing tailored support to strengthen the UK offering.
- **Upskilling UK companies on export license requirements** through the DBT-run Space Export Academy.
- **Identifying and delivering priority coordinated export campaigns,** in line with commitments in the Defence and Security Industrial Strategy, by adopting a more coherent approach between government and industry. This includes greater consideration of exportability in defence procurement processes and strengthening our relationship with industry as a key priority.

Developing the UK's Space Ecosystem

The UK space ecosystem has an active and successful set of space clusters which play an increasingly large role in the growth and resilient access to crucial capabilities across the UK. To promote this even further, we want to utilise their local expertise to test new innovative programmes in collaboration with adjacent sectors, to fuel local and national growth.

Vision: Academia, local businesses, government, and clusters have seamlessly collaborated across space and wider sectors to drive new local expertise and excellence, expand regional supply chains, and create new products and services to directly deliver against our national capabilities. There is a more coherent, nurturing, cross-UK space network for existing and new business that has driven increased domestic and international investment.

Our Missions to 2030 are to:

- **Prioritise support for the most impactful and focused clusters** to maximise their stability and contribution to our national growth strategies, encourage innovation, and attract private investment.
- **Unite our network of clusters to collaborate geographically and with other high-tech sectors** to unlock access to new growth markets, create new, larger, innovative businesses, and increase supply chain resilience.
- **Test high-impact programmes with targeted clusters** to generate high-reward R&D and infrastructure across the UK and develop a highly skilled regional workforce.
- **Harness regional industrial bases to deliver national and highly assured technical capabilities** to ensure the UK has robust, balanced, regional supply chains, and effective access to strategic capabilities.

Actions – initial new activity in 2024 to meet these missions will include:

- **Publishing a Promotional Guide to Space Clusters** at the Farnborough International Airshow in July to highlight the strengths of the UK Ecosystem domestically and internationally, highlight notable case studies, and provide opportunities for knowledge exchange.
- **Initiating a detailed implementation strategy** that sets out roles and responsibilities of delivery partners (such as the UKSA), government, and cluster leads, on how to maximise the benefits from the delivery of future programmes.
- **Giving clusters a clear voice in regional policy development** through the National Space Strategy Working Group bringing government, delivery partners, cluster stakeholders, academia, and industry together.

Monitoring and Evaluation

To successfully implement effective policy, we need to understand how we are progressing against our missions, and how they contribute to the National Space Strategy goals.

The availability of data that describes the sector is increasing and as our evidence base develops, our ability to monitor and evaluate becomes more nuanced and insightful. We will use this to improve our ability to design impactful future activity and ensure the timely and effective delivery of our strategic space goals.

Tracking the progress and success of this plan and its missions will occur at two different levels: within individual programmes, and against the overarching goals of the National Space Strategy.

Led by DSIT, we will work across the whole of government to ensure progress against this plan, driving delivery and accountability through the National Space Board and National Space Council.

Annex A: Highly Assured Technical Areas

Capability Areas		Areas	Description
Satellite Communications		Defence User Segment	High-integrity user terminals and equipment, including terminal hybridisation, also enabling bearer diversity and greater efficiencies in size, weight, and power. Assured user segment PNT technologies including global navigation satellite system receivers. MOD will also need assured anti-jam capabilities – the ability to generate or receive precise timing when terminal is prevented from receiving global positioning system data.
		Antennas, Receivers and Electronic Scanners	Access to a UK source of resilient, high performing space-based antennas and receivers is essential to assured space capability. Electronically scanned array systems, with beamforming, shaping and null generation capabilities are of particular interest. Whilst optimisation of these capability for X-band and KA-Band activity is likely to have the broadest utility to Defence, other frequencies are not discounted. Highly assured large aperture or high gain systems are likely to have niche application.
		Inter-satellite Links	Resilient Inter-satellite Link System (ISL) are an essential underwriting component of space infrastructure, including electro-optical and radiofrequency. Defence has a need for ISLs which are hardened against dazzling and other forms of interference, and for which the overall integrity of the ISL system against supply chain interference can be assured.
Space Domain Awareness		Software reconfigurable onboard process	There is a demand for critical processing technology which is reconfigurable and resilient on-orbit to be available to Defence from an on-shore supply base. MOD is particularly interested in reconfigurable processing for data traffic routing, and the generation of waveforms. On-board edge processing and algorithmic development that are enabled by reducing the size, weight, and power ratio processing, will allow us to transport data and information at a time of relevance.

Intelligence, Surveillance & Reconnaissance		Tracking Telemetry & Control	Tracking, Telemetry and Control (TT&C) is fundamental to all space operations. Defence will continue to require robust UK cryptography solutions and jamming protection for our TT&C links across all orbital regimes.
		Robust threat and hazard mitigation	On space platforms, assurance measures include prevention measures, and engineering a system to be robust (resistant to some threats), resilient (promptly recovering from other threats) or with redundancy (maintain options unaffected by specific threats). We seek to develop technologies which: assist in threat attribution, stealthy operations and active defence and deterrence measures; to further harden our assets against radiation and electro-magnetic interference; to mitigate against the risk of laser dazzling and countermeasures; to understand and counter activity in the radio-frequency spectrum and to provide capabilities which will allow us to manoeuvre rapidly and regularly. We also seek protection against dazzle and countermeasures for electro-optic and hyperspectral sensors.
		Assembly, Test & Integration	The capacity to integrate a wide variety of components in an assured way within a larger system is critical in enabling MOD access the wider market and deliver cutting edge capabilities. Threat-based environmental testing at sub system and component level will be critical to being able to understand the risk we face from evolving counter-space technologies. Performing space system integration in the UK is a key route to ensuring capability protection. Just as critical is being able to test and evaluate the performance of these integrated systems in a secure environment. This capacity will be particularly important in the test and evaluation of electro-optical and radio-frequency protective measures, as well as sensor performance and resilience.
		Software	MOD will require access to a range of space specific software in support of its activities in the space domain, particularly in support of Space Domain Awareness. MOD will leverage either bespoke software, developed to meet high standards of assurance from the outset, or where desirable, commercial software that can be forensically analysed and assured by trusted UK sources include image data processing software, astrodynamics propagator software, real-time orbit determination software, space weather forecasting data processing
Space Control			

			capability, and space object characterisation, discrimination software and network configuration and management.
Position, Navigation and Timing		Sensors	Sensors, both ground and space based, are critical for space operations. MOD requires access to assured UK terrestrial capabilities in radar system integration, and passive radio-frequency sensing, and will also seek access to sensors which enhance our understanding of space environment, hazards and threats including those which will need to be placed in-orbit. Defences sensor mix requirement will continually evolve, informed by threat and intelligence requirement.
		Time transfer through space and Timing Capability	There is a sovereign requirement for a timing capability including the ability to transfer time through space. While not space-based, as part of this there is also the requirement of timing technology, such as atomic and quantum clocks and the broader development of quantum technology.
		Alternative Navigation Technologies (AltNav)	Alternative Navigation (AltNav) technologies are required to provide an alternative PNT solution to global navigation satellite systems and enhance the UK's resilience. This will include space-based AltNav technologies, such as satellite signals of opportunity, terrestrial satellite signals of opportunity, image based odometry and image based scene matching.

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