UKSA Space Domain Awareness Study

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What is Space Domain Awareness?

Space Domain Awareness (SDA) is the identification, characterisation and understanding of any factor in the space domain that may affect space operations or impact the safety of space-based or space-enabled assets. Key components of SDA are the observation of space objects via ground-based or in-orbit sensors, analysis of the data to provide actionable products or services such as collision warnings, and analysis and forecasting of space weather events. SDA is a true international, cross-domain initiative, requiring effective collaboration for the benefit of all.

Strategic

SDA capability development demonstrates clear progress against all four pillars of the National Space Strategy and all three strategic goals of the Defence Space Strategy.

Sustainability

The sustainability of the space domain, the assets within it, and the services they provide is of such paramount importance to the UK economy that it should not be considered as a potential expense but as fundamental necessity that cannot be done without. SDA is vital to ensuring the sustainable and ongoing use of space through the continual ability to monitor, manoeuvre, and protect space assets.

SDA has a substantial impact on the sustainability of individual missions with high levels of SDA reducing the need to manoeuvre helping to conserve fuel use and increase mission duration whilst also minimising service disruption. It also enables additional sustainability technologies such as in-orbit servicing to extend mission duration and management and removal of space debris to reduce conjunction risks.

Financial

The estimated cumulative ROI based on an investment of

£568m

up to **2030** is

£2.1bn

based on the mitigated cost of a loss of space services or assets and the potential revenue of other space activities enabled by SDA.

UK SDA Landscape

The UK has a hugely successful space industry, comprising a world-leading academic sector and a proven and expert commercial sector, and is one of the top 5 of nations in terms of number of licenced assets, and with ambitious plans to leverage this success in areas such as telecoms, space-based power and in-orbit servicing and manufacturing. To achieve these ambitions, attract investment and protect its assets, the UK needs world leading infrastructure including advanced Space Domain Awareness.

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NSpOC Recommendations

Space Service Desk - A national space operations centre, bringing together the civil, military, and commercial sectors would allow for the collection, consolidation, and exploitation of SST data to produce high quality analytical products for a range of users.

SDA Advisory Group - Establish an advisory group for SDA to advise and guide on developing UK SDA capability. The group should include members from across academia, industry as well as civil and military space.

Collaboration Marketplace - A collaboration marketplace should be established to facilitate the matching of academic research with industrial demand, increasing visibility of activities and paving the way for more efficient sponsoring of research.

Sensor Recommendations

Data Accuracy Study - A study should be commissioned to assess the cost/benefit of increasing data accuracy to identify the point of diminishing returns. This study should conclude with a set of target figures for accuracy improvement over time to 2030 that can inform a plan for sensor enhancement.

R&D For Sensor Improvements - The UK should invest in the procurement of more sovereign sensors to improve its sensing capability and international credibility as well as contribute to closing gaps in global capability.

R&D Recommendations

SDA Strategy - A cross-Government SDA strategy and vision is required to cohere academia, industry, civil and military entities and provide clarity on intended aims for the UK in SDA.

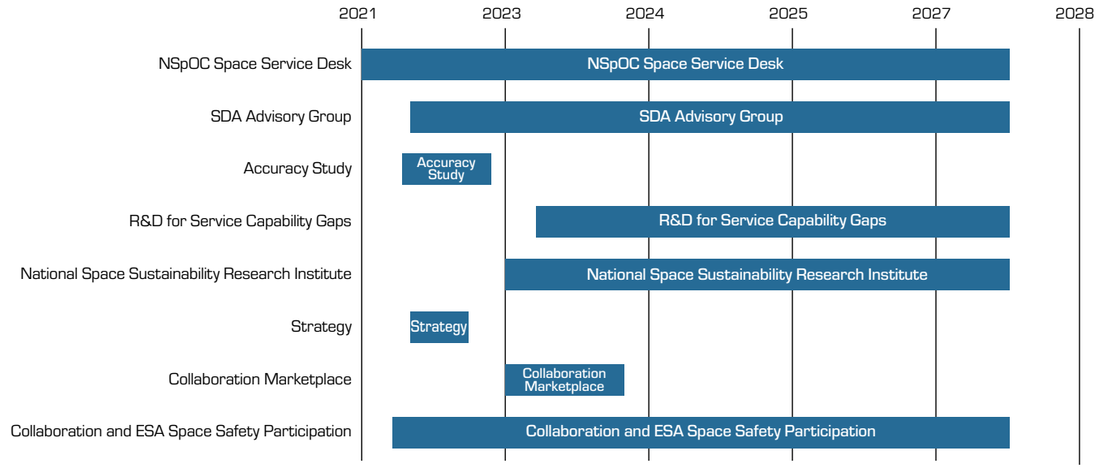
National Space Sustainability Research Institute - A National Space Sustainability Research Institute should be considered to simplify and coordinate funding for research and innovation activities.

Collaboration Recommendations

Maintaining International Collaboration - The UK should attempt to maintain the strongest possible international ties including with ESA, Five Eyes and CSpO partners, and other nations.

Roadmap

A candidate roadmap has been developed to help inform a SDA-specific strategy and complete the study.



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If you would like a copy of the full report please contact: peter.death@cgi.com