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UK space strategy and the national space interest: A methodological approach

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Contents

Forewords	1
Executive summary	4
1.0 Introduction	7
1.1 Aim and structure	8
2.0 Defining the British national space interest	9
2.1 Current understanding of the UK's interests in space	10
2.2 Definitions	11
3.0 Elements of space power: DIME analysis	14
3.1 Components of 'spaceDIME'	15
4.0 Space power paradigms	19
4.1 Standard schools of space power thought	19
4.2 The new Positional paradigm for space power	23
5.0 Long-term strategic competition in space	27
5.1 Net Assessment principles and space balance	27
5.2 The Competitive Operational Capability framework	28
6.0 Methodological application	31
6.1 The space strategy making process	31
6.2 Further recommendations	44
7.0 Conclusion	45
7.1 Key findings	45
7.2 Final reflections	46
About the author	47
Acknowledgements	48
About the Council on Geostrategy	49
Notes	50

Foreword

Space captures the public imagination and the spirit of the United Kingdom (UK). It is fundamental to society, the backbone of our economy, a catalyst for growth, and vital for our national security and defence. But threats and risks to our vital national interests in space are rising.

Over the past decade, the number of satellites in orbit has nearly quadrupled. Once, our Space Domain Awareness capabilities struggled to monitor 3,000 objects; today there are over 11,000, with forecasts of up to 60,000 by 2030. Moreover, there is now a considerable adversary counter-space arsenal on orbit – ready, rehearsed and operational.

UK Space Command's mission is to protect and defend our vital interests in space, and enable the British Armed Forces to operate globally. To achieve this, we require credible capability to deter and, if necessary, to be postured and prepared to fight and win the battle above.

Accordingly, over the past year alone, we have increased our operational purchase, launched Britain's first military satellite in over a decade, opened the National Space Operations Centre, and invested hundreds of millions of pounds in space capabilities and integration. Moreover, the 2025 Strategic Defence Review raises space to parity with the traditional domains and makes recommendations to invest in the domain.

Yet, capability is only half the battle. The intellectual foundation for thinking about space power remains thin. Unlike other domains, there is no established corpus of theory to draw upon. As a result, technological development is racing ahead of conceptual understanding. If we are to act with confidence and coherence in this domain, we must also strengthen our thinking – developing the frameworks, doctrines and strategic literacy which underpin effective space policy.

That is why this Report by the Council on Geostrategy is so valuable. It contributes to the essential work of building a British school of thought on space power: how we understand our interests, define control, and conceptualise deterrence in orbit. The study of



space control – how to ensure freedom of action for the UK and our allies and partners while constraining the options of adversaries – is not just an academic exercise; it is an urgent national imperative.

Maj. Gen. Paul Tedman CBE

Commander, UK Space Command



Foreword

A succession of His Majesty's (HM) Government reviews in 2025 across the defence and civil domains held up against the backdrop of international geopolitical turmoil have cast Britain's current space strategy into sharp relief. Is the National Space Strategy up to the job? What is it trying to achieve in terms of space power?

The UK has a highly capable – arguably world class – industrial and academic space sector, which has increasingly been placed at risk following recent spending reviews. The case for investment and government intervention is less compelling when the sector's strategic aims do not appear to align with the national context. We have excellent people in government working in the space sector, but our strategic vision is, by necessity, developed in departmental silos.

The methodological approach proposed herein could, and should, be adopted across HM Government under a 'one-government' approach to space strategy. The British space sector is facing existential challenges in the next few years. A methodology for a space strategy via a rigorous and systematic analysis of national space interests is welcomed by industry. A clear, stable, coherent strategy and subsequent coordinated delivery, in partnership with the space sector, will accelerate corporate and private equity investment into the sector and enhance the UK's international position as a space power.

Without clarity of purpose, we will miss the substantial opportunity the space sector offers to Britain. I don't think any of us want that.

Doug Liddle

Chair, UKspace

Professor in Practice, Surrey Space Institute



Executive summary

CONTEXT

- The United Kingdom (UK) lacks a clear and comprehensive understanding of its interests in the space domain. This prevents a thorough examination and acceptance of the full scope of the space domain and its potential to benefit British national power.
- There is also a lack of a substantive theoretical apparatus for space power, and of methodological approaches for strategy making in this field. One consequence of this is that British space strategy is not actually ‘strategic’.

QUESTIONS THE REPORT ADDRESSES:

- What is the UK’s national space interest?
- What kind of national space power might Britain choose to pursue?
- What methodology might be applied to the process of UK space strategy making?

KEY FINDINGS

- The enduring British national space interest is the increase of the UK’s space power. The latter is also the principal aim of space strategy, in line with Prof. Sir Lawrence Freedman’s definition of strategy as ‘the art of creating power’.
- The elements of national space power are revealed analytically through a space version of the classic ‘DIME’ framework:
 - **Diplomatic:** Bilateral, multilateral and international cooperation, and engagement on space affairs;



Council on Geostrategy

- **Informational:** National space narrative, international prestige and hard information advantage through orbital intelligence;
 - **Military:** Support to terrestrial operations, space security and space warfare capabilities; and
 - **Economic:** Space infrastructure, the industrial ecosystem and the science base.
- The main grand-strategic options for the kind of national space power Britain might choose to pursue can be summarised in a ‘Positional paradigm’ framework of four separate views of space power, according to the priority ranking of space in His Majesty’s (HM) Government’s overall strategy:
 - **The adjunct view:** Space is seen as a supplementary activity, which supports and enhances terrestrial services and life on Earth;
 - **The advantage view:** Space is recognised as a relevant factor in geostrategic and even economic-technological competition, but still as a subordinate source of leverage and a niche advantage;
 - **The ascendancy view:** Space power is admitted in government thinking as a standalone, co-equal factor in strategic competition alongside all other main elements of power; and
 - **The apex view:** The theoretical upper band of space power ambition and application, where space is understood as one of the fundamental pillars of national power.
 - The global context to which space strategy must respond should be analysed through a ‘Competitive Operational Capability’ framework on Net Assessment principles, focused on the space power balances across four functional categories:
 - **Logistics:** Launch infrastructure and cadence; in-space movement and propulsion; Rendezvous and Proximity Operations (RPO); and In-Space Assembly and Manufacturing (ISAM);
 - **Command, Control, Communication, Intelligence, Surveillance and Reconnaissance (C3ISR):** Sensing and
-



Earth Orbit (EO); Space Domain Awareness (SDA); connectivity and communications; and Positioning, Navigation and Timing (PNT);

- **Counterspace:** Kinetic Anti-Satellite (ASAT) weapons; non-kinetic Directed Energy Weapons (DEWs); Electronic Warfare (EW); and cyber capabilities; and
- **Exploration:** Human spaceflight platforms; robotic probes and rovers; scientific instruments and payloads; and deep space mission technologies.

RECOMMENDATIONS

In order to develop an effective methodological approach to space strategy, HM Government should:

1. Adopt an 'ends-ways-means' methodology based on cross-correlating the three frameworks identified in this Report, where:
 - Space DIME analysis identifies the elements of national space power;
 - These elements determine the paradigm in which national space strategy operates, which requires a certain capability mix to compete effectively; and
 - The development of operational capabilities shapes the elements of space power, which feed back into the DIME framework – thus closing the strategy cycle.
2. Consider three further suggestions, alongside offering the above methodology as the main recommendation to policymakers:
 - Create a Space Net Assessment capability within government;
 - Adopt the concept of 'national space interests' in official doctrine formally; and
 - Prioritise human space exploration for its disproportionate positive impact on space power development.



1.0

INTRODUCTION

The United Kingdom (UK) lacks a clear and comprehensive understanding of its interests in the space domain. This is perhaps to be expected, considering the short history of the field itself and Britain’s comparatively limited engagement with it.

From a methodological perspective, the relatively limited extent of scholarship on space power theory presents another difficulty in bringing clarity to the concept of ‘space interest’. Space interests are entwined with space power, but a deficit of theoretical development of the latter limits how closely it is possible to define the former.

It is time for British strategic thinking on space affairs to mature. Here, there is a disconnect: His Majesty’s (HM) Government has had to develop policy and subsequent strategy documents for space in response to the quick evolution of the domain itself through a reactive process. This contrasts with the proactive, gradual process of policy evolution in most other domains, which happens over time.

Space is a complex domain. Physically, it is literally infinite. Technologically, it is free from the entire set of fundamental constraints imposed by the Earth’s gravity.

Clarifying the UK’s space interests is vital for effective policymaking. Even if the chronic fragmentation of HM Government’s decision making on space is overcome – and even more so if greater funding becomes available – successful policy will not automatically be the result. Whether in the civil sphere or in the military one, there should be a single guiding light towards which policy converges in order to make the most of Britain’s national resources in this domain. The UK’s European Space Agency (ESA) policy, for example, should not be conceived as a self-contained issue only loosely tied to a generic ‘national goal’ such as prosperity or growth, but should be subordinated to specific (and likely long-term) national space interests. Likewise, the driving



concept behind British defence space policy should surpass broad statements, such as ‘protecting and defending’ space assets, and be framed in more specific and strategic terms, again linked to the country’s overall national space interests.

1.1 Aim and structure

In order to contribute to the urgent work of clarification in British strategic thinking on space affairs, the following research questions have driven this Report:

1. What is the UK’s national space interest?
2. What kind of national space power might Britain choose to pursue?
3. What methodology might be applied to the process of UK space strategy making?

To answer these questions, this study first explores the notion of ‘national space interest’ and its relation to space strategy and space power, outlining its core parameters through a novel application of Diplomatic, Informational, Military and Economic (DIME) analysis. Second, building on some of the traditional schools of space strategic thinking, the Report proposes a new way of classifying top-level visions or paradigms of national space power – providing the *ends* of strategy – across four tiers. Third, this study offers a framework for analysing the key space technology capability balances in the global space competition, drawing on Net Assessment principles. This helps to determine the *ways* of space strategy through the capability mix required to compete effectively against rival space powers. Finally, the Report considers the notional application of these conceptual tools by drawing them together and showing how capability development profiles can feed back into the DIME framework of space power as the *means* of strategy, thus completing a coherent ‘ends-ways-means’ process for British space strategy making.



2.0

DEFINING THE BRITISH NATIONAL SPACE INTEREST

The ‘national interest’ is always a matter of some debate, regardless of topic. There is certainly no fixed definition that covers all contingencies. Official documents may outline a government’s objectives and intentions in different policy areas, but this is not enough to respond to or take advantage of changes in the strategic environment. Historical practice or traditional policy patterns, filtered through deeper layers of strategic culture and national identity, add further understanding to what a country generally wants to achieve, or how it will normally handle a particular question where its interests clash with those of foreign powers.

Beyond these factors, it is the politics of the day which have a critical role in shaping the national interest on any given issue when a major decision is required. A presumed ‘national consensus’ on certain topics is often very fragile or even illusory, and certainly vulnerable to political interference if the national interest is not well-defined. In other cases, it can be the result of untested, default assumptions or ‘comfort zones’, thus keeping a country locked in a sub-optimal policy trajectory and depriving it of greater opportunities.

2.1 Current understanding of the UK's interests in space

Britain operates with a very limited understanding of its national space interests. This, in turn, is a function of the limited understanding within HM Government – and the UK Parliament – of the full importance of space, both for the purposes of British policy and of its importance in absolute terms as a driver of global affairs in the 21st century and beyond.

The Strategic Defence Review, published in June 2025, recognised space as a ‘critical national infrastructure sector, a site of growing competition, and a domain that is central to warfighting’.¹ These official pronouncements suggest a clear upward movement of space through the ranks of national priorities as understood in government. At the same time, this recognition is shallow and empirical, rather than deep and backed by sound theory which can reach beyond ‘facts’. It is based on the observed impact of space technology, such as the size of the UK’s space sector, the criticality of space systems for resilience across various critical national infrastructures or the deepening dependency upon space of the British Armed Forces.

This empirical understanding of space, coupled with the short history of this policy area, prevents a thorough examination and acceptance of the full scope of the space domain and its potential to benefit British national power. It also accounts for the lack of a significant political ‘space lobby’ in the UK, as well as for the marginal role, funding and priority which space enjoys in Britain’s national policy mix.

In terms of ambition, HM Government’s views on space fall far short of the benchmark set by other nations with space capabilities. The definition of Britain’s space ambition is framed in limited and desultory terms: the 2021 Integrated Review announced to the world that the UK merely wants to be a ‘meaningful actor’ in space,² a ‘target’ reconfirmed in the 2021 National Space Strategy.³ Even the National Audit Office took issue with this elusive and ultimately meaningless phrase, noting that ‘the Strategy did not, however, set out clear and specific aims, or provide

¹ ‘The Strategic Defence Review 2025 – Making Britain Safer: secure at home, strong abroad’, Ministry of Defence, 02/06/2025, <https://www.gov.uk/> (checked: 29/10/2025).

² ‘Global Britain in a Competitive Age: The Integrated Review of Security, Defence, Development and Foreign Policy’, Cabinet Office, 16/03/2021, <https://www.gov.uk/> (checked: 29/10/2025).

³ ‘National space strategy’, UK Space Agency, 27/09/2021, <https://www.gov.uk/> (checked: 29/10/2025).

guidance on the outcomes that the government wants to achieve in a set timeframe.⁴

More problematic than the lack of a clearly stated and compelling national ambition for space is the lack of any references in government policy papers to the notion of a distinct *British* national space interest – as if such a thing does not exist.⁵

There is thus an entire level of understanding and analysis regarding UK space affairs which is missing from HM Government policy. This is, arguably, the result of space policy and strategy being assembled in a bottom-up process from individual departmental submissions, rather than through a proper top-down strategy making exercise tied to wider considerations of statecraft and Britain’s role in the world.

This is why UK space strategy is not actually *strategic*, but is little more than a collage – and lowest common denominator – of how different branches of HM Government think that space applies to their brief. The departments cannot be faulted here; since space is not seen as a standalone area of national power, departments are obliged to link any prospective space activities within their remit to HM Government’s top political priorities (such as ‘growth’, or ‘levelling up’ under a previous administration). This is in contrast to how policymaking should work in a strategic domain, i.e., beginning with identifying the goals to pursue – the ends of strategy – flowing from an understanding of what is important and why.

2.2 Definitions

The concepts of ‘space power’ and ‘national space interest’ are fundamental to any exercise in national space strategy making. With respect to the former, previous Council on Geostrategy research has distinguished between *spacepower* and *space power*;⁶ a distinction which is retained here:

⁴ ‘The National Space Strategy and the role of the UK Space Agency’, National Audit Office, 23/07/2024, <https://www.nao.org.uk/> (checked: 29/10/2025).

⁵ A deceptively similar notion – that of generic national interests being at play in the space domain – does get passing mention in the National Space Strategy, but, even through its vagueness, it is functionally entirely different from the focused, dedicated conception of ‘national space interest’ discussed here.

⁶ See: Gabriel Elefteriu, ‘Why should Britain invest in military spacepower?’, Council on Geostrategy, 17/10/2024, <https://www.geostrategy.org.uk/> (checked: 29/10/2025).



Spacepower is the military component of space affairs. Military spacepower is wholly subordinated to *national space power*, which includes not only the totality of the national space enterprise that sustains it,⁷ but also the non-military aspects of space power. In turn, the definition of (national) space power follows that given by [John] Sheldon and [Colin] Gray as: “The ability in peace, crisis or war to exert prompt and sustained influence in and from space”.⁸

As an operative concept, the ‘national interest’ functions in general as a double-sided lens for policy decision making. It helps to identify external questions, which are said to be *of* national interest to a country, and it helps frame the country’s own policies, which are said to be *in* the national interest. The first task is therefore to determine the scope of the definition in a space context, and the second task is to determine its object (see: Box 1).

BOX 1: SCOPE AND OBJECT OF THE UK’S NATIONAL SPACE INTEREST

Scope: The British national space interest encompasses all issues, events, entities and decisions – at home and abroad – which can have a material impact on the status and development of UK space power.

Object: The enduring British national space interest is the increase of UK space power.

This formulation is consistent with Prof. Sir Lawrence Freedman’s definition of strategy as ‘the art of creating power.’⁹ By extension, it follows that space strategy is the art of creating space power. In other words, the development of space power is the principal aim of strategy, which in turn can only exist to serve the national interest.

⁷ See: Gabriel Elefteriu, ‘Better space: Consolidating the UK National Space Enterprise’, Council on Geostrategy, 12/11/2024, <https://www.geostrategy.org.uk/> (checked: 29/10/2025).

⁸ The ability in peace, crisis or war to exert prompt and sustained influence in and from space. See: Colin Gray and John Sheldon, ‘Space Power and the Revolution in Military Affairs: A Glass Half Full?’, *Airpower Journal*, 13:3 (1999).

⁹ Sir Lawrence Freedman, *Strategy: A History* (New York: Oxford University Press, 2013).



The utility of the definitional approach articulated above is that it allows HM Government to design and orient policy in line with the national space interest proposed here (i.e., the increase in British space power). The result would be a more disciplined and effective application of space policy interventions, and a concentration of effort towards a guiding purpose.

Acceptance within HM Government that there is such a thing as a UK national space interest as a standalone consideration of the highest strategic order – rather than just as a loose, haphazard collection of ‘space policy challenges’ subordinated to other classes of national interest – is the necessary first step on Britain’s road to space power.



3.0

ELEMENTS OF SPACE POWER: DIME ANALYSIS

The UK's key policy documents in this area – the National Space Strategy and the Defence Space Strategy – will likely be due an update in the following 18 months or so. Their next iteration should avoid the vagueness and aimlessness of past strategies, and demonstrate a clear understanding and application of the notion of the British national space interest to the main challenges and questions facing the UK in the space domain. These can be defined and categorised in a variety of ways. Below is one first attempt at this task, using the DIME framework to describe the elements of national space power and considering the nominal national space interests at play in each case (see: Box 2).

BOX 2: DIME

DIME helps to explain national power by arranging national activity and outputs into Diplomatic, Informational, Military and Economic elements. In other words, DIME is a framework for describing national power.¹⁰

- **Diplomatic:** Influence through foreign policy, alliances and international negotiations;

¹⁰ In 1939, Edward Carr divided international political power into three categories: military power, economic power and the power over opinion. During the Cold War, the US and its armed forces expanded those categories and developed a four-element schema known as DIME. See: E. H. Carr, *The Twenty Years' Crisis 1919-1939: An Introduction to the Study of International Relations* (London: Macmillan & Co., Ltd., 1946).



- **Informational:** Control and dissemination of information, including soft power, propaganda and cultural influence;
- **Military:** Hard power through armed forces, defence capabilities and military technology; and
- **Economic:** Wealth, trade, industrial capacity and financial influence.

3.1 Components of ‘spaceDIME’

The space version of DIME – called ‘spaceDIME’ for the purposes of this Report – offered here introduces three sub-elements under each component of the framework.

3.1.1 DIPLOMATIC

The Diplomatic component of spaceDIME includes the following elements:

- **Bilateral cooperation** ranging from individual missions to complex space relationships or partnerships (astropolitical influence). The defence space collaboration between the UK and the United States (US) is a prime example.
- **Multilateral cooperation** and alliances, best illustrated at present by Britain’s ESA membership. The possible addition of a space element to AUKUS Pillar II would also fall in this category.
- **International engagement** in space negotiations and diplomacy on aspects of the global space regime, mostly conducted through United Nations (UN) formats and within the bounds of the Outer Space Treaty. Examples include the UK’s initiatives on responsible space behaviour resolutions at the UN,¹¹ as well as efforts on space sustainability.

¹¹ See: Aidan Liddle, ‘Responsible behaviours in outer space: Towards UNGA 76’, Foreign, Commonwealth and Development Office, 08/06/2021, <https://blogs.fcdo.gov.uk/> (checked: 29/10/2025).

3.1.2 INFORMATIONAL

In a space context, the Informational component of the original DIME framework is best understood both in its narrative meaning and in its 'data' sense across three sub-elements:

- **National narrative** is about a country's space activities, directed at domestic audiences, which articulates the national ambition in space and the place of space in the national story. Britain currently does not have a coherent national space narrative to speak of. At the opposite end of the scale, the People's Republic of China (PRC) has cultivated an extremely powerful space narrative, which has positioned the Chinese space programme as a pillar of national ambition and collective pride.
- **International prestige** is derived largely from achievements in space exploration and space science, but also comprises, in a wider sense, a country's reputation as a consequential actor in this domain and as an attractive place for space business. The UK has obvious strengths in this area, drawing on the reputation of its science base and its contributions to the National Aeronautical and Space Administration (NASA) and ESA missions in particular. However, the quasi-total absence of Britain from the field of human space exploration, as well as the lack of any UK-only and UK-flagged national space missions, counts against its prestige.
- **Orbital intelligence** in this context refers to a country's overall ability to have information coverage of the space operating environment, both for operational and strategic communication purposes. For example, Britain is leveraging its National Space Operations Centre (NSpOC) both to enhance its own understanding of the space domain and to project influence internationally.

3.1.3 MILITARY

The Military component of spaceDIME is divided into three sub-elements spanning the current and near-future tasks of spacepower:



- **Terracentric support** reflects the traditional role of military satellites in providing support to operations on Earth,¹² including for missile defence. The UK lacks sovereign capabilities in this area, except for the Skynet communications system, but it is developing Intelligence, Surveillance and Reconnaissance (ISR) systems with one demonstrator, Tyche, already in orbit.¹³
- **Space security** comprises defence space missions at the lower end of the scale, from space cybersecurity and protection systems to non-kinetic offensive counterspace capabilities. Britain has some capability in some of these areas.
- **Space warfare** includes kinetic orbital warfare and ground-based Anti-Satellite (ASAT) weapon systems and associated space vehicles, and, in the foreseeable future, terrestrial strikes from orbit. The UK does not currently compete in these areas.

3.1.4 ECONOMIC

The Economic component of spaceDIME is designed to encompass the key non-military elements of the National Space Enterprise, with the exception of the institutional factor governing space policy and programme management, which is assumed:

- **Infrastructure** comprises the ground segment and launch (spaceports, Space Launch Vehicles [SLVs] and ground control stations); civilian and commercial orbital assets across all main types of services (e.g., from Earth Observation [EO] and Position, Navigation and Timing [PNT] to solar, Active Debris Removal [ADR], weather and other climate monitoring missions); and digital services (i.e., the uptake of space services across the economy). Britain has some notable capabilities in some of these areas, but overall it lags far behind peer nations, such as France.

¹² The US Space Force refers to this as 'Global Mission Operations'. See: 'Space Force announces new mission statement', US Space Force, 06/09/2023, <https://www.spaceforce.mil/> (checked: 29/10/2025).

¹³ 'UK Space Command successfully launches first military satellite', Ministry of Defence, 17/08/2024, <https://www.gov.uk/> (checked: 29/10/2025).



- **Industrial ecosystem** examines the status of large-scale integrators, the specialist supply chain and the non-industrial aspects of the business ecosystem (e.g., legal, financial and regulatory). The UK's interest here is not merely to generate more turnover in the industry, but to shape the domestic industrial base in particular ways which serve the goals of national strategy.
- **Science base** ranges from academic space science centres and labs to a country's involvement in space science missions, and to its achievements and capabilities in human space exploration in particular. Britain makes world-class contributions to space science, but in niche areas and on a limited scale, with no national end-to-end space missions.



4.0

SPACE POWER PARADIGMS

The spaceDIME framework is descriptive. Even though some of its elements are immediately suggestive of certain courses of policy action – especially when held against the overarching purpose of increasing UK space power – it has no intrinsic prescriptive function. Policymakers can use spaceDIME analysis to identify and understand issues where the British national space interest is at stake, but not necessarily what to do about it, or what priority to assign to each aspect under consideration (i.e., determining its importance).

Two further ‘filters’ or tools are needed for these tasks. One requirement is a systematic way to analyse and understand the global context in which UK space policy evolves, and to which it must respond, given that policy does not happen in a vacuum. This challenge is tackled in Section 5.0 of this Report.

The other requirement, discussed in this Section, is for a coherent vision or paradigm of space power, which can be used to set goals and facilitate policy design and application in an intentional and consistent manner.

4.1 Standard schools of space power thought

No fully fledged, accepted space power theory is available, as scholarship in this area is still in its early stages. Instead, for the purposes of policymaking, Britain can operate at the more general level of space power *schools of thought*. While lacking the rigour of theory per se, classifying perspectives on space affairs according to schools of thought



brings some discipline and coherence to the debate and the policymaking process.

4.1.1 LUPTON'S CLASSIC UTILITARIAN PARADIGM

Multiple authors have attempted to classify theoretical thinking on space power and space operations, and almost all of them have done so from a defence space perspective. Nevertheless, their principles are relevant and easily applicable to the wider understanding of 'space power' used in this study. The classic approach, devised in the late 1980s by David E. Lupton, describes four foundational schools of space strategic thought, from the perspective of the role and utility they each envisage for space power:¹⁴

- **The Sanctuary School** views space as a neutral domain for peaceful, scientific pursuits, prioritising exploration, astrophysics and civilian applications such as weather monitoring. It emphasises international cooperation through joint missions (e.g., the International Space Station) and treaties to prevent space weaponisation. Strategically, it fosters collaboration to avoid conflict, focusing on shared scientific advancement over power projection. Unlike other schools, it criticises military uses of space, promoting space as a global commons for humanity's benefit.
- **The Survivability School** views space as a critical enabler of terrestrial operations first, emphasising the need to protect EO, communications or PNT satellites and maintain their functionality. It recognises the growing reliance on these systems for military, economic and civilian purposes, and prioritises resilience against both kinetic and non-kinetic threats. Asset protection approaches include hardening satellites against attacks, developing redundant systems, enhancing satellite manoeuvrability or deploying defensive countermeasures such as decoys. From a policy standpoint, the Survivability School advocates for investments in defensive technologies, redundancy and international agreements to reduce threats, albeit from a national interest perspective rather than a liberal internationalist one.

¹⁴ David Lupton, *On Space Warfare: A Space Power Doctrine* (Montgomery: Air University Press, 1988).

- **The Control School** seeks to dominate space by securing operational freedom for a country's forces while denying adversaries access to space, and using military capabilities such as ASAT weapons and jamming. It focuses on controlling key orbits, especially Low Earth Orbit (LEO), to support terrestrial campaigns through intelligence and communication superiority. Strategically, it enables tactical advantages by disrupting enemy space assets, prioritising military operations over protection or peace. More offensive than the Survivability School, it contrasts with the Sanctuary School's cooperation, aiming for supremacy within the space domain.
- **The High Ground School** believes space provides the ultimate strategic vantage point for military dominance, enabling decisive influence over terrestrial and space conflicts. It prioritises space-based weapons, missile defence and control of assets such as lunar bases or cislunar space for global power projection on Earth and in orbit. Strategically, it seeks supremacy through offensive capabilities and deterrence, surpassing the Control School's focus on access denial. Unlike the Sanctuary School's peaceful ethos or the Survivability School's defensive stance, it embraces weaponisation to leverage space as the decisive domain for national power.

4.1.2 RECENT PERSPECTIVES

The advent of the US Space Force in 2019 occasioned a new wave of attempts at theorising the role and purpose of spacepower. Research by the Aerospace Corporation proposed six separate perspectives from an operational standpoint (see: Table 1):

TABLE 1: PERSPECTIVES OF SPACEPOWER¹⁵

Perspective	Description
Space control first	Advocates gaining space control first to allow all other uses of space to proceed.

¹⁵ Russell Rumbaugh, 'What Place for Space: Competing Schools of Operational Thought in Space', Centre for Space Policy and Strategy, 07/2019, <https://csp.s.aerospace.org/> (checked: 29/10/2025).



Enable global missile war	Presumes that precision-guided missiles (ballistic and hypersonic) are poised to change fundamentally how war is fought, so long as space-based capabilities for surveillance, targeting and navigation are available.
Keep the plumbing running	Presumes traditional military operations remain dominant, although dramatically more effective because of space.
Frictionless intelligence	Presumes the value of space for gathering strategic intelligence supersedes all other uses.
Nukes matter most	Presumes nuclear war is so terrible a possibility that the role of space in commanding nuclear weapons should supersede all other uses.
Galactic battle fleet	Sees even grander long-term uses of space for national security, including space-based weapons which can strike anywhere in the world, defence of the planet from any threat originating elsewhere in the universe, and exploitation of key orbital 'terrain' beyond geosynchronous Earth orbit.

The other major approach to distinguish between different types of space power thinking takes Earth as the reference point and simplifies the debate into just two main perspectives inspired by naval strategy:¹⁶

- **The brownwater school** of space power, which 'looks down on Earth', sees the value of space primarily as supporting and enhancing terrestrial activity and military forces. In space, it focuses on ensuring operational continuity in crowded orbits while denying adversaries short-range advantages. Unlike expansive approaches, it avoids deep space overextension, concentrating on defensive and responsive tactics in a contested near-Earth environment.
- **The bluewater school**, which 'looks out from Earth' and while accepting the support functions of space power, sees its long-term goal and fulfilment as enabling human expansion into space and protecting in-space commercial and other interests. It thus extends

¹⁶ See: Peter Garretson, 'Bluewater and Brownwater Space Strategies and Their Budgetary Profiles', Nonproliferation Policy Education Centre, 08/2023, <https://npolicy.org/> (checked: 29/10/2025). The creation of the US Space Force spawned a new wave of thinking along these lines. See: Malcolm Davis, 'Towards a blue-water space force?', Australian Strategic Policy Institute, 19/05/2020, <https://www.aspistrategist.org.au/> (checked: 29/10/2025).

to deep space projection in cislunar regions, lunar surfaces and beyond, aiming for sustained global influence through multi-role capabilities such as reusable spacecraft or lunar bases. It focuses on long-range logistics, resource control (e.g., helium-3 mining) and space-based weapons to achieve strategic superiority.

4.2 The new Positional paradigm for space power

The standard schools of space power thought are not fully adequate for the purposes of national space strategy making, because they focus exclusively on the *utility* and *use* of space in the abstract, and do not account for the *status* of space power within a country's overall grand-strategic framework. However, the core challenge for space power development on a national basis is precisely the way in which space is recognised and integrated in top-level political strategic thinking in government, which ultimately determines a country's level of directed ambition and national interest in space affairs. Thus, the fundamental question which any school of thought, vision or paradigm of space power must answer is: **'How central is space power to national strategic thinking?'**

Within the second Trump administration, US space policy is seeing a fundamental shift. The most impactful developments are taking place in the area of American military spacepower, with the advent of the Golden Dome project and the historic doctrinal shift of the US Space Force towards a space superiority posture.¹⁷ The geopolitical context has also changed radically in recent years, while the build-up of global space capabilities – particularly in the PRC – has accelerated to an unprecedented level. These developments are effectively invalidating much of the previous tradition codified in the existing schools of space power thought.

An alternative approach from the perspective of the centrality of space power to a country's self-perceived national interest – the 'Positional paradigm' – can be summarised in the manner shown in Table 2. Additionally, it should be noted that each category of space power in this framework should be understood as a spectrum of policy focus and prioritisation.

¹⁷ See: Gabriel Elefteriu, 'Rethinking Britain's defence space posture', Council on Geostrategy, 21/05/2025, <https://www.geostrategy.org.uk/> (checked: 29/10/2025).



TABLE 2: SUMMARY OF THE POSITIONAL PARADIGM FRAMEWORK OF SPACE POWER

View	Definition	Core focus	Strategic implications
Adjunct	Space as an add-on or supplementary activity, which enhances terrestrial services and life – not central to national strategy.	Supporting Earth-based needs (e.g., satellite communications, weather monitoring).	Low-priority investments in space technology for everyday utilities, eschewing deep integration.
Advantage	Space as a tool for strategic advantage in pursuit of terrestrial objectives, providing leverage in Earth-focused goals.	Gaining edges in military and economic terrestrial affairs (e.g., EO satellites).	Investments in space assets for tactical benefits such as intelligence or navigation, tied to ground operations or for general economic growth.
Ascendancy	Space as a co-equal core element of national power, requiring systematic build-up in orbit and beyond to integrate with other domains (e.g., land, sea, air).	Balanced integration and governance of space capabilities (e.g., launch, orbital networks, exploitation, lunar gateways).	Methodical development for multi-domain synergy, emphasising sustainable infrastructure and strategic parity.
Apex	Space as the paramount priority, surpassing other elements of national power, demanding accelerated, aggressive expansion for dominance.	Elevating space above all domains (e.g., full space control and military power projection on Earth from orbit, space colonisation).	Urgent investments in hard power assets (e.g., space-based weapons, orbital habitats, lunar bases) for hegemony.

4.2.1 THE ADJUNCT VIEW

In the adjunct view, space is seen as a supplementary activity, which supports and enhances terrestrial services and life on Earth, and which serves as an add-on or overlay to core national priorities rather than a central strategic element.

It takes different forms across a spectrum of postures, from minimal engagement in space activities, limited to basic satellite usage for essential services such as weather monitoring (with little national investment or strategic oversight) to significant reliance on space for supporting terrestrial infrastructure, such as advanced remote sensing, while still viewing it as an accessory without integrating it into national power structures.

In the military field, the Adjunct approach ranges from limited passive satellite data for terrestrial situational awareness, with no dedicated military space capabilities, to the use of advanced commercial sensors for tactical intelligence. However, space remains peripheral to military strategy.

4.2.2 THE ADVANTAGE VIEW

In the advantage view, space is recognised as a relevant factor in geostrategic and even economic-technological competition, but still as a subordinate source of leverage and niche advantage in certain contexts, such as in aspects of defence or in boosting economic competitiveness.

It covers policy stances ranging from the consistent utilisation of space services across government and the economy, with limited national ownership or development of dedicated space systems, to more intensive integration of commercial capabilities, such as launch and limited deployment of sovereign space assets and applications (including surveillance and communications networks or missile warning systems), to secure substantial terrestrial advantages. Yet, space development remains secondary to terrestrial priorities, and space power remains disconnected from the other elements of national power.

4.2.3 THE ASCENDANCY VIEW

In the ascendancy view, space power is admitted in government thinking as a standalone, co-equal factor in the strategic competition alongside all other main elements of power, with the space competition seen as a high and urgent priority to national strategy and status in global affairs.

States operating within the ascendancy approach engage in a systematic build-up in orbit and beyond to integrate space seamlessly with other domains such as land, sea, air and cyber. It covers a variety of space postures, from the gradual incorporation of space into national strategy through capacity-limited – but full-spectrum orbital – and



terrestrial space infrastructure (including well-developed launch), at first ensuring minimal co-equality with other domains via shared governance and ranging to comprehensive systematic expansion, including advanced space stations and cislunar assets, fully embedding space as a peer domain with robust multi-domain coordination. In military spacepower terms, it features aggressive space superiority doctrines and the deployment of limited kinetic ASAT weapons alongside other orbital warfare capabilities.

4.2.4 THE APEX VIEW

The apex view covers the theoretical upper band of space power ambition and application, where space is understood as one of the fundamental pillars of national power, and ultimately, beyond the foreseeable future, as the dominant one, with the space competition seen as vital to national strategy.

This view demands an accelerated and uncompromising programme of space expansion to achieve dominance in orbit, cislunar space and beyond. It takes a number of forms, from an aggressive prioritisation of space through comprehensive launch capabilities and rapid development of infrastructure in key orbits (elevating it slightly above other domains with focused resource allocation) to a theoretical full commitment to expansive dominance, including space colonisation and advanced hard power space assets, subordinating all other domains to a space-centric national destiny. The military space postures under this approach range from prioritising the early deployment of orbital weapons to secure strategic dominance and deterrence across the domain to the build-up of extensive space-to-Earth orbital strike systems for terrestrial dominance.



5.0

LONG-TERM STRATEGIC COMPETITION IN SPACE

After the grand-strategic framing of space power, the second foundational requirement for space strategy and the determination of the national interest is to have a coherent method for analysing the space domain in a global context. All major nations – regardless of their attitude to space, but especially if they are pursuing space power – should also respond to real-world challenges in the space domain, rather than simply make space development decisions in a siloed, self-referential manner. As before, there are different ways to categorise these challenges, but one high-level approach is to apply a ‘Competitive Operational Capability’ framework, borrowed from Net Assessment.

5.1 Net Assessment principles and space balance

By definition, space is the ultimate long-term strategic competition, given the infinite scope for physical strategic expansion and technological development in this domain. Net Assessment, as the premier analytical framework designed precisely for analysing long-term competitions, provides the most appropriate lens through which to filter the national space interest and the requirements of space strategy.¹⁸

Strategic competition is an interaction between two or more establishments in all dimensions. During the Cold War, the focus was on the interaction of Western and Eastern Bloc defence establishments. In a

¹⁸ See: Gabriel Elefteriu, ‘A Question of Power: Towards Better UK Strategy Through Net Assessment’, Policy Exchange, 28/11/2018, <https://policyexchange.org.uk/> (checked: 29/10/2025).

space context, this idea can be adapted into an interaction of National Space Enterprises.

The purpose of strategy under competitive conditions is to disrupt the balance of power and therefore collapse an opponent’s strategic position.¹⁹ This does not require conflict, although it can accommodate it. Strategic policy decisions which generate asymmetries can be enough to gain decisive advantages, as the Cold War demonstrated. By applying a Net Assessment method, the high-level categories of functional or operational capability-focused space balances which underlie the strategic space competition can be discerned.

5.2 The Competitive Operational Capability framework

Traditionally, ‘functional’ net assessments analyse the military balance from the point of view of a particular capability, or an aspect of the competitive landscape from a strategic perspective, such as the nuclear balance or the naval balance. Applied to space, functional balances of space power would consider core operative categories of strategic space advantage at the present state of technological development, resulting in four typologies: Logistics; Command, Control, Communication, Intelligence, Surveillance and Reconnaissance (C3ISR); Counterspace; and Exploration (see: Table 3).

TABLE 3: KEY COMPETITIVE OPERATIONAL CAPABILITY BALANCES

Logistics	C3ISR	Counterspace	Exploration
Launch infrastructure and cadence (e.g., reusable systems, high-frequency operations and large payload mass capacity for cost-effective	Sensing and EO (e.g., advanced optical and radar sensors for Earth observation and real-time data collection, including multi-spectral imaging).	Kinetic ASAT weapons (e.g., direct-ascent missiles and co-orbital interceptors).	Human spaceflight platforms (e.g., crewed capsules and habitats for orbital and lunar missions).

¹⁹ See: Andrew Marshall, ‘Long-Term Competition with the Soviets: A Framework for Strategic Analysis’, RAND Corporation, 04/1972 <https://www.rand.org/> (checked: 29/10/2025).



Earth-to-orbit access).

In-space movement and propulsion (e.g., advanced ion and nuclear thrusters for efficient orbital transfers and deep space transit).

Space Domain Awareness (SDA) (e.g., ground and space-based sensors for tracking orbital objects, debris and adversary activities).

Non-kinetic Directed Energy Weapons (DEW) (e.g., lasers and high-power microwaves).

Robotic probes and rovers (e.g., autonomous landers and surface mobility systems).

Rendezvous and Proximity Operations (RPO) and space robotics (e.g., automated docking, satellite servicing and in-orbit refuelling for sustainment).

Connectivity and communications (e.g., laser/optical networks and delay-tolerant systems for resilient data relays across missions).

Electronic Warfare (EW) (e.g., ground-based jamming and spoofing systems).

Scientific instruments and payloads (e.g., spectrometers, telescopes, etc.).

In-Space Assembly and Manufacturing (ISAM) (e.g., modular construction) and other space resource exploitation technologies, such as space solar power and mining.

PNT (e.g., quantum clocks and cislunar networks for precise guidance in contested environments).

Cyber capabilities

Deep space mission technologies (e.g., space autonomy and navigation systems).

5.2.1 LOGISTICS

The **logistics balance** encompasses all major capability differentiators involved in space access, movement and sustainment, from Launch infrastructure and cadence, and payload mass,²⁰ to RPO and manoeuvrability, and ISAM technologies. The Logistics imperative applies across all orbital regimes, and space strategies which recognise a

²⁰ The concept of Mass Value, developed by Peter Hague, is particularly useful in analysing launch balances. See: Peter Hague, 'Mass Value', *Planetocracy*, 03/10/2020, <https://planetocracy.org/> (checked: 29/10/2025).



future national space interest in cislunar and deep space should not fail to account for this.

5.2.2 COMMAND, CONTROL, COMMUNICATION, INTELLIGENCE, SURVEILLANCE AND RECONNAISSANCE (C3ISR)

The **C3ISR** balance groups all major satellite capabilities (civil, commercial and military) whose main strategic effect centres on the collection, generation and transmission of different types of data into one functional category. It is further subdivided, both across commercial and military missions, into sensing and EO, SDA (ground and space-based), connectivity and communications, and PNT.

5.2.3 COUNTERSPACE

In the present competitive framework, the **counterspace** balance has a more restricted understanding than the standard scope of the term, as it excludes dual-use systems and others which are often part of counterspace missions, such as SDA. This category is thus dedicated to space or ground-based weapons systems and other military capabilities developed specifically and exclusively for targeting space systems components, subdivided in the traditional way across kinetic ASAT weapons, non-kinetic DEWs, EW and cyber capabilities.

5.2.4 EXPLORATION

The **exploration** balance comprises all activities and platforms used for human or robotic presence and science missions in Earth orbit, on the Moon, and towards Mars and beyond. It is subdivided into human spaceflight platforms, robotic probes and rovers, scientific instruments and payloads, and deep space mission technologies. Exploration appears as a standalone category because of its vital role in national narratives – as exploration is the core ethos of spaceflight – and for its ability to drive cutting-edge Research and Development (R&D). Strategically, exploration capabilities enable spacefaring nations to establish footholds in new space regions, such as on the Moon. The exploration balance is therefore not a niche scientific concern, but a core dimension of the global space competition.



6.0

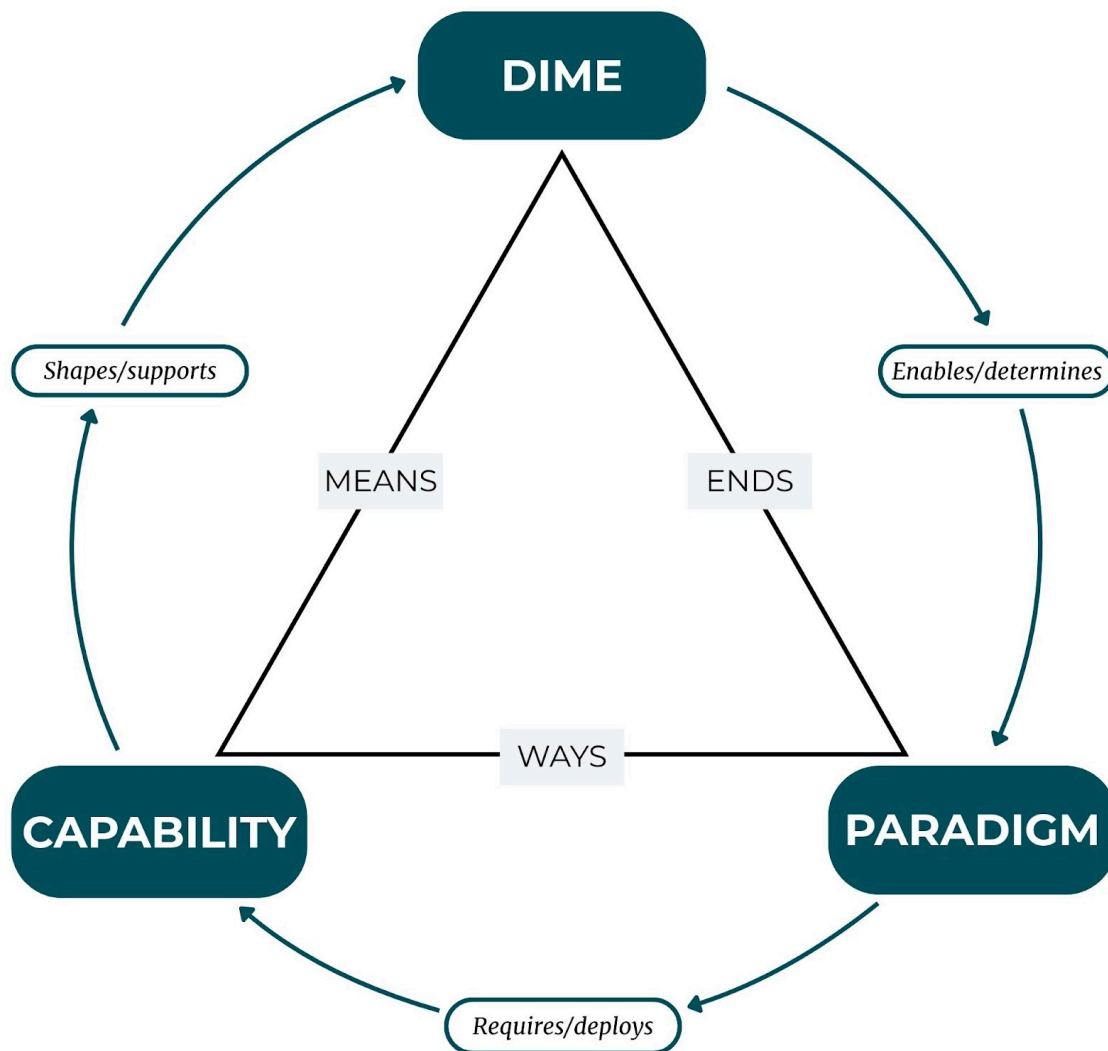
METHODOLOGICAL APPLICATION

The task of addressing the drift and incoherence of current UK space strategy, along with the vagueness of the national ambition for the space domain, is more than simply a matter of political will, and certainly goes beyond matters of institutional reorganisation or leadership. This task is, first of all, an intellectual problem of the first order. It demands strategic answers in an effectively completely new, extremely complex and rapidly evolving field of strategy (space), which remains severely under-researched and lacks any authoritative theoretical foundations.

6.1 The space strategy making process

The absence of any substantial theoretical apparatus is why the process of space strategy making is itself a challenge. The conceptual tools developed and presented in this Report – spaceDIME analysis, the Positional paradigm of space power and the Competitive Operational Capability framework – are intended to help in this respect. They should be applied to the process of space strategy making in a particular way; in the sense that it requires a specific method. This method is described in Sections 6.1.1, 6.1.2 and 6.1.3, and is structured around the classic understanding of strategy as *Ways connecting Means to Ends* (see: Diagram 1). This provides a useful guideline to British space strategy making within the frameworks outlined in this study.

DIAGRAM 1: THE SPACE STRATEGY MAKING PROCESS



6.1.1 ENDS

The starting point in the process is the spaceDIME analysis, which identifies the elements of national space power and their current status. The national space power profile is then correlated with the Positional paradigm framework described in Section 4.2 in order to determine the strategic paradigm of space power in which the UK is operating. This is the stage where a political decision is required on whether to select a



higher paradigm as the goal of national space power development – the ends of strategy.

Table 4 summarises the full correlation between spaceDIME and the Positional paradigm framework. An approximate and subjective ‘scoring’ of existing British space power elements is indicated by the shaded cells.

TABLE 4: CORRELATION BETWEEN SPACEDIME AND POSITIONAL PARADIGM FRAMEWORKS

SpaceDIME element/sub-element	Adjunct view	Advantage view	Ascendancy view	Apex view
Diplomatic: Bilateral cooperation	Limited to occasional sharing of basic satellite data for non-strategic purposes, with no complex partnerships or astropolitical influence.	Selective partnerships for space intelligence sharing and/or limited science and commercial joint projects, supporting minor astropolitical influence.	Integrated partnerships for orbital infrastructure, building astropolitical influence through multi-domain ties.	Extensive partnerships for militarised space dominance, exerting powerful astropolitical influence.
Diplomatic: Multilateral cooperation	Minimal or limited participation in international forums for utility services, such as weather data, without forming alliances.	Substantial participation in multilateral organisations (e.g. ESA), and other joint projects for limited space technology R&D with Earth-focused applications.	Co-equal participation in alliances and structures for shared space projects and/or governance, fostering balanced coalitions.	Leadership of extensive space alliances prioritising large-scale space infrastructure projects and deep space missions.
Diplomatic: International engagement	Passive compliance with the Outer Space Treaty (OST), with no active role in negotiations	Significant advocacy for new rules to protect existing advantages (e.g., via space	Active diplomacy and ability to influence OST-level regime changes.	Dominant diplomacy to reshape the OST for space-centric hegemony.



	and rule making.	security and debris mitigation clauses).		
Informational: National narrative	Space portrayed domestically as a practical tool for everyday 'public benefit' (e.g., growth, Critical National Infrastructure [CNI], etc.), with little emphasis on major achievements to inspire national pride.	Space highlighted domestically as a key enabler for achieving terrestrial goals (e.g., economic or military) and for the country's future.	Space as a core element of national identity, integrated into domestic stories of multi-domain strength.	Space as one of the select top few drivers of national destiny, dominating domestic rhetoric for national pride.
Informational: International prestige	Limited prestige from basic satellite services, seen as commonplace utilities rather than symbols of national capability.	Moderate prestige from scientific contributions, technological innovation and military applications.	Symbol of astropolitical power through national exploration missions, orbital networks and cislunar presence.	Ultimate symbol of space superiority through colonisation and military spacepower potential.
Informational: Orbital intelligence	Basic ground-based monitoring for situational awareness.	Advanced but limited ground-based SDA, enabling some deterrence and attribution in certain scenarios.	Integrated extensive SDA capabilities (including in-space) for multi-domain superiority, enabling robust deterrence and prompt attribution.	Extensive domain intelligence across all orbital regimes and in cislunar space.
Military: Terracentric support	Limited space support for ground	Significant sovereign space assets	Extensive, multi-orbit military	Extensive, resilient, persistent,



	operations via own means, with other support largely sourced commercially or from allies.	for tactical support and some strategic functions, with limited missile defence support.	satellite infrastructures, and full multi-domain integration of space and the space layer for advanced missile defence.	highly integrated military satellite constellations for complete space-based information superiority.
Military: Space security	Standard cybersecurity for ground segment and commercial satellites (e.g., weather or communications), with no non-kinetic counterspace.	Advanced cybersecurity across space systems, passive protection of satellites and limited non-kinetic counterspace.	Advanced passive protection (e.g., shielding and high manoeuvrability), and advanced non-kinetic/ EW capabilities (e.g., jamming, spoofing and lasing).	Proliferated space-based space security capabilities, including space-based lasers, with full orbital coverage.
Military: Space warfare	No dedicated kinetic space warfare capabilities.	Direct ascent ASAT capability and/or co-orbital ASAT; inspector satellites.	Extensive proliferated kinetic space control and military spaceplanes.	Advanced global terrestrial strike from orbit, cislunar control and proliferated Single Stage-To-Orbit (SSTO) spaceplanes.
Economic: Infrastructure	Limited ground station network; use of commercial satellite services (e.g., for weather monitoring and PNT); small-scale, emergent launch; and low uptake for space-derived	Significant ground segment and launch, limited nationally controlled orbital infrastructure and moderate digital uptake.	Robust launch capacity; systematic build-out of ground, orbital and cislunar satellite infrastructure; in-space resource exploitation; and widespread digital uptake.	Large-scale efficient heavy launch, and extensive ground and space infrastructure enabling space-economic dominance.



	data applications.			
Economic: Industrial ecosystem	Reliance on largely off-the-shelf supply chains for small satellites, with limited industrial capacity.	Niche sector strengths and limited Large Systems Integrator (LSI) diversification, with a vibrant and competitive but low-scale supply chain.	Robust manufacturing base with high LSI competition, a largely national extensive supply chain and strong investment ecosystem.	Multi-dimensional, comprehensive space industrial base as a core sector of national economy.
Economic: Science base	Limited R&D in academia for basic science missions.	Advanced but niche science and technology research labs, exquisite but small-scale contributions to science missions and minimal human space exploration capability.	Advanced space stations and robust human space exploration programmes.	Large-scale human presence in orbit (e.g., habitats and stations), on the Moon and/or Mars; and an extensive deep space missions portfolio.

6.1.2 WAYS

The next step in the strategy process proposed in this study is to correlate the Positional paradigm framework with the competitive analysis of space balances: the Competitive Operational Capability framework described in Section 5.2. This exercise reveals what operational capabilities are required under each space power paradigm in order to compete effectively in the space-strategic environment. As this is essentially a question of choosing a particular path of space power development in response to given strategic conditions, this step corresponds to the *ways of strategy*.

This approach also permits an assessment of what new capability levels a country needs to attain in order to move up to a higher space power status – in line with its politically determined ambition – and improve its strategic position in the space domain.



Table 5 summarises the full correlation between the two frameworks. Again, an approximate ‘scoring’ of Britain’s current level of capability and technological development is indicated by the shaded cells. The UK’s desired level of capability – i.e., enabling the national space ambition, set by the political factor – would also be immediately identifiable once ministers have made their decision. Seen from this perspective, the central purpose of national space strategy would be to chart a policy course to the next chosen level of British operational capability across the explored categories.

TABLE 5: CORRELATION BETWEEN COMPETITIVE OPERATIONAL CAPABILITY AND POSITIONAL PARADIGM FRAMEWORKS

Competitive Operational Capability framework element/ sub-element	Adjunct view	Advantage view	Ascendancy view	Apex view
Logistics: Launch infrastructure and cadence	Basic, infrequent launches using commercial providers for small satellites, with no focus on reusable systems or high cadence.	Diversified but limited capacity launch capabilities, up to semi-reusable systems.	Robust, reusable launch systems with high cadence for deploying integrated orbital and cislunar assets, supporting multi-domain operations.	Reusable heavy launch systems with rapid, high-frequency launches for dominant orbital, lunar and interplanetary asset deployment.
Logistics: In-space movement and propulsion	Limited to standard chemical propulsion for commercial satellites, with no advanced thrusters or deep space transit capabilities.	Advanced ion propulsion technology for repositioning satellites – focused on near-Earth orbits, not deep space transit.	Deploying cutting-edge propulsion technology (e.g., nuclear) for high delta-v manoeuvres, and efficient orbital transfers and cislunar transit.	Next-generation propulsion, including nuclear, for rapid deep space transit, enabling expansive colonisation and control.



<p>Logistics: RPO</p>	<p>Non-existent or minimal, confined to commercial satellite repositioning and debris mitigation without automated docking or servicing.</p>	<p>Emergent RPO technology for satellite servicing, with basic docking capabilities and military applications.</p>	<p>Sophisticated RPO technology for automated docking and satellite servicing, enabling sustainable orbital economy.</p>	<p>Pervasive deployment of highly manoeuvrable autonomous RPO technology for servicing, and orbital and cislunar infrastructure development.</p>
<p>Logistics: ISAM</p>	<p>Absent or emergent, as space infrastructure is not prioritised beyond terrestrial support functions.</p>	<p>Limited, focused on niche commercial uses supporting terrestrial economies, not large-scale construction.</p>	<p>Significant in-orbit production facilities, modular in-space construction, and 3D printing for orbital stations and lunar gateways.</p>	<p>Large-scale orbital manufacturing, and extensive construction for permanent orbital habitats, lunar bases and Martian outposts.</p>
<p>C3ISR: Sensing and EO</p>	<p>Commercial optical and Synthetic-Aperture Radar (SAR) sensors largely for Earth observation (e.g., weather and agriculture), with limited multi-spectral imaging.</p>	<p>Advanced, high-resolution optical, radar and other sensors, with on-board processing for tactical support.</p>	<p>Advanced sensor technology across all major phenomenologies for integrated Earth and space observation, and sophisticated missile defence.</p>	<p>State-of-the-art sensors, including quantum, for dominant Earth, cislunar and deep space observation and targeting.</p>
<p>C3ISR: SDA</p>	<p>Limited ground-based tracking for commercial satellites, lacking real-time or adversary-</p>	<p>Developing ground and space-based sensors, processing and integration with partial</p>	<p>Extensive ground and space-based high-resolution sensors for agile tracking of objects and</p>	<p>Highly advanced pervasive orbital and cislunar sensors for tracking all objects and</p>



	focused awareness.	coverage and limited resolution for mission support and basic adversary monitoring.	adversaries across orbits.	adversaries, enabling total situational awareness.
C3ISR: Connectivity and communications	Limited commercial radio-based satellite communications (satcom) for civilian uses.	Significant satcom technology deployment, resilient military satcom, and emergent optical links to enhance terrestrial command and control.	Mega-constellation deployment, and extensive use of laser and optical networks for resilient multi-domain satcom, supporting integrated operations.	Advanced high-capacity networks for resilient communications in Earth orbit, cislunar and beyond.
C3ISR: PNT	Reliance on existing Global Navigation Satellite Systems (GNSS) for terrestrial navigation, with emergent space-based enhancements.	Sovereign, resilient GNSS with emergent space-based backups and alternative PNT.	Sophisticated, resilient GNSS and advanced alternative PNT, with large-scale integration across CNI and military.	Extensive use of quantum clocks and cislunar PNT networks for precise guidance across domains and into deep space.
Counterspace: Kinetic ASAT weapons	Minimal or nonexistent development or deployment.	Limited potential or development of dual-use ground-based ASAT missile technology and emergent technology for military RPO.	Ground-based ASAT missiles, spaceplanes and co-orbital interceptors for multi-domain space combat and targeting.	Proliferated ASAT systems and manoeuvrable platforms for prompt, large-scale strike from ground, and in-space positions with full orbital and cislunar coverage.



<p>Counterspace: Non-kinetic DEWs</p>	<p>Emergent ground-based ASAT directed energy capabilities.</p>	<p>Ground-based lasers for satellite dazzling, with limited coverage.</p>	<p>Advanced space-based laser and microwave ASAT for disrupting and damaging adversaries' satellites.</p>	<p>High-power space-based laser, microwave and Electro-magnetic Pulse (EMP) capabilities for widespread satellite disruption and space control.</p>
<p>Counterspace: EW</p>	<p>Limited commercial-grade ground-based jamming for terrestrial purposes.</p>	<p>Advanced ground-based jamming and spoofing systems to deny adversary support to terrestrial operations.</p>	<p>Extensive space-based jamming and EW attack systems to deny adversary space operations in multi-domain conflicts.</p>	<p>High-powered proliferated long-range jamming and spoofing in all orbital domains; total adversary denial; and prioritising space hegemony.</p>
<p>Counterspace: Cyber capabilities</p>	<p>Basic cybersecurity for commercial satellites and ground stations, with no offensive space-focused tools.</p>	<p>Military-grade cyber tools to defend satellite networks, with limited offensive capabilities against ground infrastructure.</p>	<p>Sophisticated cyber tools for defending and attacking space systems, integrated with other domains.</p>	<p>Cutting-edge cyber tools for neutralising adversary systems across all space segments.</p>
<p>Exploration: Human spaceflight platforms and systems</p>	<p>Research and technology R&D in space medicine and life support systems, and limited human spaceflight (dependent on</p>	<p>Significant sovereign human spaceflight programmes and associated technology development, with limited</p>	<p>Extensive human presence on orbital stations and an emergent ability to deploy lunar bases.</p>	<p>Large-scale permanent crewed orbital habitats with artificial gravity, as well as for lunar and Martian colonisation.</p>



<p>Exploration: Robotic probes and rovers</p>	<p>foreign support). Limited to scientific payloads on international missions, with no independent probes.</p>	<p>orbital station deployment. Ability to deploy end-to-end missions, primarily for Earth-focused science, with limited cislunar and planetary exploration.</p>	<p>Advanced autonomous landers for lunar and planetary exploration, and highly developed deep space exploration programmes.</p>	<p>Large-scale development and deployment of autonomous exploration missions across the solar system, including for resource capture.</p>
<p>Exploration: Scientific instruments and payloads</p>	<p>Standard instruments for Earth-focused data (e.g., climate measurement sensors), with minimal space science.</p>	<p>Advanced instruments for astrophysical research and discovery missions, and niche support for deep space exploration missions.</p>	<p>Major scientific instruments (e.g., telescopes) deployed on deep space platforms.</p>	<p>Highly capable space science technology deployed at scale for scientific discovery and astrophysical analysis.</p>
<p>Exploration: Deep space mission technologies</p>	<p>Limited technology (e.g., emerging satellite autonomy for near-Earth data relay), with scope limited to monitoring deep space passively without dedicated missions.</p>	<p>Basic autonomy for near-Earth missions, with no focus on deep space navigation.</p>	<p>Systematic use of Artificial Intelligence (AI) and pulsar systems for integrated multi-domain missions, with scope including cislunar and planetary probes.</p>	<p>Sophisticated AI-driven and pulsar-based systems, and new communications technology for independent Mars and interplanetary missions, ensuring unchallenged space exploration primacy.</p>

6.1.3 MEANS

The final step in the strategy making process is to correlate the Competitive Operational Capability analysis of space balances with the spaceDIME framework. In this way, it is possible to anticipate how the pursuit of certain operational capabilities – identified in Section 6.1.2 – will shape and enhance the elements of national space power, which are effectively the fundamental *means* of national space strategy. This exercise returns the strategic process to its starting point, closing the feedback loop of strategy making and allowing for a clear determination of national space interests.

Table 6 summarises a simplified version of the correlation between the Competitive Operational Capability and spaceDIME frameworks, focused only on the headline elements of each, rather than also including their subdivisions.

TABLE 6: CORRELATION BETWEEN COMPETITIVE OPERATIONAL CAPABILITY AND SPACEDIME FRAMEWORKS

Competitive Operational Capability framework element	Diplomatic	Informational	Military	Economic
Logistics	Enhances space diplomatic influence by enabling international partnerships for shared launch infrastructure and sustainment protocols, fostering astropolitical ties through access agreements.	Boosts orbital intelligence capabilities by providing reliable launch and in-space movement for deploying sensing and communication satellites, supporting data relay and situational awareness.	Supports military operations by enabling rapid deployment of assets for deterrence and space control, integrating logistics with terrestrial and space missions.	Drives economic growth through robust launch systems, in-space manufacturing and propulsion technologies, building a strong ecosystem for space infrastructure development.



C3ISR	Strengthens diplomacy through alliances for shared terrestrial intelligence and SDA data, shaping space governance norms for ISR/SDA cooperation.	Enhances informational dominance via advanced sensing, SDA and PNT systems, ensuring real-time superiority and deterrence across domains.	Amplifies military capabilities with precise ISR for terrestrial and space operations, enabling command, control and strategic strikes.	Supports economic development by deploying orbital networks for navigation, communications and data services, fostering industrial ecosystems for ISR technologies.
Counterspace	Advances diplomacy by negotiating counterspace regulations and alliances, aligning nations against space threats to secure strategic leverage.	Amplifies informational impact through SDA for counterspace operations, enabling attribution and deterrence narratives against adversaries.	Enhances military power with kinetic ASAT, lasers and cyber capabilities for space control, denying adversaries access and enabling strategic space warfare operations.	Contributes to economic strength by protecting national assets, deterring space aggression, driving technology R&D and supporting space industrial base development.
Exploration	Supports diplomacy through cooperation on shared missions, fostering international coalitions for lunar and Martian exploration and establishing norms.	Elevates national prestige globally, and enables powerful domestic narratives and support for space investment and national space leadership.	Improves military space posture by leveraging exploration platforms (e.g., lunar bases) for strategic purposes.	Fuels economic growth through exploration-focused infrastructure (e.g., habitats and rovers) and R&D, enabling new business and technology sectors for colonisation and resource exploitation.



6.2 Further recommendations

The strategic methodology outlined in this Report is, itself, the main recommendation. By applying this methodology, space strategy makers in HM Government will ensure a coherent process for discerning the specific national space interests which the UK should pursue in the development of its space power, and a close alignment with the country's overall grand strategy. The limited scope of this study does not allow for a full unpacking of the frameworks and processes proposed here. Therefore, there are three further recommendations related to the application of this methodology:

- 1. Space Net Assessment:** HM Government should put in place a capability for the detailed analysis of the global space power balance across the four core elements of the Competitive Operational Capability framework described in this Report. An accurate and in-depth understanding of the long-term strategic competition in space affairs is foundational to effective British space strategy.
- 2. National space interest:** HM Government should adopt the concept of 'national space interest' formally in its official documents, and integrate it with national interests in other domains. 'Space integration' across HM Government is a doctrinal issue as well.
- 3. Human spaceflight:** HM Government should prioritise human space exploration for its disproportionate positive impact on space power development, particularly as a driver of effective national space narratives.



7.0

CONCLUSION

There is no responsible policy alternative to increasing UK space power. This task is only becoming more important as global space development accelerates around Britain – both among its allies and partners and its adversaries. Remaining a minor player, or falling further behind in this strategic area, will only place the UK in a position of dependency and subordination to other space powers, with severe consequences for the country’s overall status. Britain is a mature country – and indeed, a leading one – in all aspects of national power on Earth, and is able to safeguard its sovereignty across all fundamental elements required for a functional polity, from economics to national security. Yet, it is increasingly exposed in space.

7.1 Key findings

This Report has presented a methodology for space strategy making which relates space power to the national space interest. The need for developing a theoretical apparatus for national space strategy is inarguable, particularly in a UK-focused context. There is no coherent British school of thought in space affairs, both because of the lack of any tradition of scholarship in space power theory, and because of the lack of any UK national space programme to speak of.

Furthermore, the experience of recent years in British space policymaking and the limited ambition of UK space power indicate that before further ‘policy planning’ is done, more methodological work is required. This groundwork is vital in order to develop more solid arguments for British space development.



7.2 Final reflections

The UK may not afford, at present, to act at the required scale on all of its identified national space interests. But an awareness of what those interests are, and a systematic understanding of its options and priorities, are indispensable for making judicious policy choices. Without them, Britain cannot chart a coherent trajectory to meet all those national space requirements in the future instead of indulging in the aimless, haphazard approach taken thus far.



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