


Defence and the Commercialisation of Space

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How does space commercialisation impact Defence?

For the UK, programmes such as Skynet offer a view into how a nation procures satellite systems to maintain a strategic space-based capability. First developed in the 1960s and launched in late 1969, the Skynet constellation has provided secure and international communication lines for British and allied troops for over half a century.

The cost and technical investment and knowledge needed to develop, launch, and operate such systems was always a barrier for most agents. It meant that the cost to develop and maintain similar systems could always be offset by selling spare or peacetime capacity to third parties. However, with the rise of competing commercial systems, this may become a less profitable reimbursement avenue.



Over the last decade, space has become an increasingly privatised domain with rapidly growing commercial prospects, as private companies and entrepreneurs access space for commercial gains. This, combined with the growth in research and government space activity, has resulted in the highest number of novel asset launches into Earth orbits than at any point in history.

Domains such as space exploration, satellite deployment and supporting related activities have all begun to be commercialised, impacting areas that have traditionally been used by government space agencies. The move towards shared access to space has several impacts for Defence and security internationally. These include:

Space accessibility:


The private space actors are pushing innovation and development of technologies that will reduce the cost of access to space. Companies, including Blue Origin, Virgin Galactic and SpaceX, are pioneering novel access pathways such as reusable rockets and launch systems. This reduced entry cost for space will allow defence organisations to deploy satellites and related hardware more economically, so that larger systems can be built and launched to increase monitoring, communication and support intelligence gathering.

Competition for space:

As space's commercial interest grows, so do satellite launches. An estimated 1,100 launches have been predicted for 2025 compared to 2018's 365. Starlink, a SpaceX venture, wants to launch a constellation of 12,000 satellites by 2027. However, this surge will intensify the competition. China is reportedly aiming to launch 13,000 satellites that could contest SpaceX's plans to fill available low earth orbit (LEO) slots and fill them with their own sovereign assets. The increase in capable surveillance and communication satellite constellations adds pressure to defence organisations – particularly when it comes to protecting nations and deployed assets from being tracked or observed.

Space as-a-service:

The rise of privatised space assets has seen a growth of varied services emerging, spanning; satellite imagery, earth observation, telemetry, remote sensing and more. Many of the companies providing these services offer pathways to purchase real-time data for private or commercial use. Any of these services can be used for military or civilian activities. Defence organisations should consider exploiting the abundance of information that can be procured and applied to conflict monitoring, military tracking, battlefield reporting, general observation and intelligence-gathering activities by integrating them with existing military data sets.



Redundancy planning:

Large-scale space programmes for national defence traditionally depend upon (often single-source) procurement of a small number of high-value assets, which can present a sizeable risk for their country. Diversifying commercial space offerings allows for contingency planning and redundancy systems to be simultaneously developed, maintained, and contracted to support any government programmes in a more efficient and practical way.

In line with this, in 2020 the UK government and India's Bharti Global each acquired a 45% share in OneWeb's LEO satellite communications company. The £400 million investment from the UK included a stipulation to allow control over any future ownership sale. With this investment placed in the scope of future Skynet asset procurements, it is expected that OneWeb interoperability, or technological integration may be incorporated into the Skynet 6 architecture. These are currently manufactured by a joint venture involving Airbus Defence and Space (ADS), who, until January 2023, had been the operators responsible for manoeuvring Skynet assets. They will have the required expertise to advise on the best way to combine each system and their respective capabilities.

Disruptive technologies:

In recent years, new avenues have emerged in the communications domain for satellites looking to bridge mobile and satellite platforms through 5G and 6G developments. While 6G development is expected to start in 2025, there are still several anticipated releases for 5G, before the UK Government implements plans to deploy 5G across the nation by 2030. The release 18 of 5G, also known as 5G Phase 2, introduces several new features and improvements to the network, including the integration of satellite communications. The combination of 5G with satellite communications will result in seamless and reliable connectivity in areas where terrestrial networks are not available or have limited coverage.

This can be especially useful for remote locations such as rural, maritime, or, disaster-stricken areas, and for mobile users including aeroplanes, ships, and vehicles. The potential global coverage will give users access to high-speed internet and other 5G services anywhere in the world. This can be particularly beneficial for Internet of things (IoT) devices, which need to operate in remote locations using a reliable and stable Internet connection.

This could result in the next generation of embedded micro circuits for ground receivers giving organisations greater flexibility at a reduced cost when interacting with Satcom. Military organisations must consider augmenting their existing capability and use these enhanced networks to expand their coverage regions, while benefitting from the secure line-of-sight communications provided by Satcom.



Collaboration:

As military groups reflect on the benefits of private space data within conflicts, the future of space business will head further towards partnerships and information sharing coalitions between defence organisations and industry – akin to the Five- Eyes (FVEY) agreement that enables the UK to share space data with allies. By partnering with industry, Defence can benefit from access to leading innovations and fast-paced development pathways, while industry can benefit from the security and stability of government Defence contracts. This collaboration already occurs in several sectors of space, including research, shared access to infrastructure and joint programmes to launch or develop space-missions.

Multi-domain technologies:

As space continues to be privatised and developed, there is a growing loss of separation between societal and defensive hardware, where many systems will have civilian and military application. The more sophisticated commercial earth observation, tracking, or telemetry and communication options become, the more challenging it will be for governments and Defence policymakers to define what can and cannot be shared internationally. Careful observation and regulatory management will be needed for key technologies by nations to protect their respective security strategies.

Counter-space:

There is an increased risk of asset collision due to the rise of non-state actor activity that is both a commercial and government problem, which could disrupt orbital pathways of other state and private agents. This risk profile brings with it a potential for international tensions. As militaries grow and develop capabilities to disrupt or disable satellite systems to achieve their objectives, the strategic importance of space as a domain for Defence agencies to preserve the continuation of our increasingly space-dependent society increases.

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In conclusion, the rapidly evolving landscape of space technology presents both challenges and opportunities for the UK's defence and security sector.

Defence organisations must adapt to this new paradigm by leveraging commercial innovations, integrating emerging technologies like 5G and 6G satellite communications, and collaborating with industry partners.

Embracing these changes will ensure that the UK remains at the forefront of space-based capabilities, protecting national interests in an increasingly complex and interconnected world.



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