

Beyond the Satellite - Where Value is Emerging in Space

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Space has become a decisive domain of national power, underpinning economic prosperity, critical infrastructure, military effectiveness and strategic competition.

Billions of people rely every day on services enabled by space, often without recognising their dependence. Financial transactions, communications, transport networks, weather forecasting, energy distribution, emergency response and agriculture all rely on space infrastructure. Positioning, Navigation and Timing (PNT) services synchronise financial markets, mobile phone networks and electricity grids. Satellite communications provide connectivity where terrestrial infrastructure is unavailable or degraded, while Earth observation increasingly informs everything from agriculture and insurance to disaster response and defence intelligence.



Figure 1. Space underpins national security, critical infrastructure, and economic prosperity

The economic significance is equally compelling. The global space economy is valued at more than US\$600 billion annually and is forecast to exceed US\$1 trillion within the next decade.

For investors, however, the more interesting opportunity extends beyond the continued growth of satellites, launch and other established segments of the space economy.

As economic and military dependence on space increases, the domain is simultaneously becoming more congested, contested and interconnected. Individual satellites are becoming components of increasingly distributed architectures; commercial infrastructure is becoming integral to national capability; and governments must increasingly understand, connect and protect a rapidly expanding number of space-based systems.

As a result, we believe value is increasingly moving towards the architecture that makes space capability useful and resilient. This suggests that value is emerging in systems that support space-based awareness, connectivity, resilience and orchestration.

Dependence creates vulnerability...and demand

Modern armed forces, particularly allied nations are fundamentally dependent on space.

Satellites provide intelligence, surveillance and reconnaissance; secure global communications; precision navigation; missile warning; strategic deterrence; and command and control. They allow military forces to understand the battlespace, coordinate operations over vast distances and deliver precision effects at speed.

That dependence creates military advantage, but it also creates vulnerability.

Potential adversaries increasingly seek to disrupt, degrade or deny access to satellite services through electronic warfare, cyber-attack, directed energy, kinetic anti-satellite weapons and co-orbital systems. Space has consequently evolved from primarily enabling operations in other domains to becoming a contested operational domain in its own right.

This changes the underlying demand signal.

It's no longer sufficient to place increasingly sophisticated capability into orbit. Governments and commercial operators must also know what is occurring around those assets, protect access to them, move information between increasingly distributed systems and continue operating when individual elements are disrupted or degraded.

For investors, the significance is understanding that as the economic and military value of space-enabled capability increases, so does the value of understanding, connecting and protecting it.

From individual assets to resilient architectures

Another structural shift is occurring in the architecture itself.

Over the past two decades, reusable launch has materially reduced the cost of placing capability into orbit. Proliferated Low Earth Orbit constellations have demonstrated the resilience available from distributing capability across large numbers of satellites rather than concentrating it within a small number of exquisite systems. Cloud computing, artificial intelligence and edge processing are simultaneously changing how rapidly information collected in space can be converted into actionable intelligence.

Optical communications provide another example. Laser crosslinks can allow constellations to move large quantities of data between satellites without relying on terrestrial relay infrastructure, creating the potential for more resilient global networks and near real-time movement of intelligence and command information.

The result is a transition from individual spacecraft towards increasingly distributed, software-defined and interconnected architectures.

This closely mirrors changes occurring elsewhere in defence technology. Individual platforms and sensors remain important, but operational advantage increasingly depends upon connecting capabilities, moving information between them and converting that information into decisions.

For investors, this transition matters. As the number and sophistication of individual space assets increase, value is increasingly likely to emerge in the capabilities that allow those assets to function collectively - understanding the operating environment, connecting distributed systems, maintaining access under threat and orchestrating increasingly complex architectures.

Commercial capability is becoming military infrastructure

Perhaps the most significant change for investors is who will provide this capability.

The United States has progressively shifted from a predominantly government-owned space model towards one in which commercial companies are integral to national capability. Companies such as SpaceX, Blue Origin and Amazon Web Services now provide infrastructure and services spanning launch, communications, cloud computing, satellite operations and space logistics.

The relationship extends beyond procurement.

The United States increasingly treats commercial industry and allied space forces as integral components of future military space operations. Coalition structures including the Combined Space Operations Initiative and Operation OLYMPIC DEFENDER¹ are strengthening multinational planning, intelligence sharing and operational integration, while commercial operators are increasingly incorporated into military space awareness and planning.

Europe is undergoing a similar evolution. NATO has recognised space as an operational domain and is strengthening cooperation through shared Space Domain Awareness, commercial partnerships and multinational initiatives, while the European Space Agency is expanding activity in secure communications, Earth observation, space surveillance and dual-use infrastructure.

¹ Operation Olympic Defender is a United States-led multinational military operation designed to coordinate allied space capabilities, improve space domain awareness, and deter hostile or aggressive actions in outer space

This is an important distinction for investors. Commercial space companies are increasingly not simply suppliers to government; their technology and infrastructure can become components of much larger sovereign and allied architectures.

Australia is particularly relevant within this model.

Its geography provides advantages for space surveillance, deep-space communications and launch, while integration with the United States and other partners provides access to a much larger allied ecosystem. Australia's participation in Combined Space Operations and Operation OLYMPIC DEFENDER demonstrates that its future opportunity does not depend upon replicating every element of US sovereign capability.

This expands the potential addressable market. A capability does not necessarily need to solve a uniquely Australian requirement. Technologies developed or validated in Australia can potentially form part of broader allied architectures, while international technologies can use Australia for deployment, integration and regional expansion.

Follow the operational demand

The commercialisation of space is already creating opportunities across satellite communications, Earth observation, launch, cloud infrastructure, data analytics and in-orbit services.

For investors, however, identifying where value may emerge next requires following the operational problems created by increasing dependence and architectural complexity.

We see four increasingly important areas.

- **Awareness.** As space becomes more congested and contested, understanding what is occurring in orbit becomes increasingly valuable. Space Domain Awareness, sensing, tracking and characterisation provide the information required to distinguish normal activity from potential threats and make informed decisions about increasingly important assets.
- **Connectivity.** Distributed architectures only create advantage if information can move between them. Resilient satellite communications, optical networks and alternative PNT are increasingly important to maintaining connectivity when terrestrial or space-based infrastructure is disrupted.
- **Resilience.** As dependence increases, architectures must continue operating despite attack, failure or degradation. Distributed constellations, responsive launch, satellite replenishment and other approaches that reduce dependence on individual high-value assets can increase the survivability and adaptability of space-enabled capability.
- **Orchestration.** As the number of sensors, satellites, networks and data sources grows, the challenge increasingly becomes making them operate as a coherent system. Autonomous mission management, AI-enabled exploitation and the integration of commercial, sovereign and allied systems can convert increasingly large volumes of information and individual capabilities into operational advantage.



Figure 2. Value is emerging at the intersection of complex operational problems.

These areas are not independent. Awareness informs decisions; connectivity moves information; resilience maintains access; and orchestration brings the architecture together.

Many also sit at the intersection of defence and commercial markets. This dual-use characteristic can create revenue pathways beyond a single defence procurement program while still addressing enduring national-security requirements.

The investment question is therefore who can solve the complex operational problems for governments and commercial customers that operate at the intersection of these capability areas.

The architecture is the opportunity

Space power will be an increasingly important feature of economic, military and strategic advantage over the coming decades.

Nations able to protect space infrastructure, integrate commercial innovation, cooperate effectively with allies and continue operating in contested environments will possess significant advantages. Those unable to assure access to space-enabled services will face vulnerabilities extending well beyond military operations into communications, finance, transport, energy and other critical infrastructure.

For investors, the opportunity is to consider capabilities beyond the rockets, satellites or any individual technology. As the domain becomes more congested, contested and interconnected, value is increasingly moving towards the architecture that makes space capability useful and resilient - understanding what is happening, connecting increasingly distributed systems, maintaining access under threat and converting information into decisions.

Early stage ventures will provide a significant proportion of that innovation, while governments and allied militaries are already adapting their operating models to access and integrate it.

The investment opportunity is increasingly in enabling governments, militaries and commercial operators to understand, protect, optimise and orchestrate what is already there.