

Bringing the Private Sector to Space

Operationalizing Commercial Space for U.S. National Security

By Clayton Swope

Executive Summary

A steady cadence of **speeches**, **strategies**, **reports**, and **recommendations** from senior defense officials and experts extol the virtues of commercial space and urge increased use of commercial space services and products for national security. Yet the rhetoric does **not match reality**, in spite of meaningful **progress** made at the Pentagon, as commercial space is not being integrated and used at the scale needed to maximize its contribution to operations.

The Department of Defense (DOD) is making it easier to buy commercial space, creating **contracts** and developing new **frameworks**, but sorting out how to acquire commercial solutions is only part of the problem. The military needs a process to validate when commercial products and services meet operational requirements. There is also currently no formal service-level guidance on accepting commercial space services into operational use from the Space Force or any other service.

Though policymakers recognize the need to modernize requirements processes, there has been much less attention paid to operationalization challenges, including the unique difficulties of operationalizing a commercial service. Unlike commercial products, which mostly fit into current processes, commercial space services are incompatible with Space Force **system acceptance** procedures for operational capabilities. As such, the military risks fielding commercial services that have neither undergone an equivalent level of vetting as other systems used for warfighting nor a rigorous process to optimize how they fit into the joint force.

Full integration and maximized use of commercial space services only happens when commercial services can be operationalized like any other warfighting capability—i.e., included in readiness and sustainment activities, budgeted in operations and maintenance accounts, allocated and presented to combatant commanders for operational use, and considered in future force planning.

Assumptions and Definitions

This paper uses the definition of a commercial **product** and **service** found in Title 41 of the U.S. Code. Thus, when the government purchases a commercial space product it is purchasing a tangible item, which upon delivery, becomes the government's property and can be stored, transported, and operated at the sole discretion of the government. On the other hand, when the government purchases a commercial space service, it is not buying a tangible item but rather a commitment from a provider for an agreed-to result, outcome, or task. The provision of a commercial service is intrinsically linked to an ongoing relationship with the provider, whereas the relationship with a vendor can be separated upon delivery of the product to the government.

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This report focuses on commercial space services—also called the **space-as-a-service model**—for two reasons: the growing prevalence of this business model in the space industry and the unique challenges associated with operationalizing a commercial service. There is neither an **acquisition pathway** in the DOD's Adaptive Acquisition Framework (AAF) nor Space Force service-level **guidance** for operationalizing commercial services. Though both the AAF and Space Force instructions include guidance on using commercial services, neither set of guidelines provides a clear path to operations and sustainment for services.

No similar barriers exist to operationalize commercial space products, because in the AAF and Space Force system acceptance framework, commercial products look no different than custom-built capabilities. Both commercial products and traditional systems—like an F-35 fighter or Ford-class aircraft carrier—are handed over to the military as the new owner and operator. The military almost certainly maintains a relationship with the vendor of these capabilities, but it is for acquiring parts and upgrades, for example, and not part and parcel of the day-to-day operation of the weapon system.

As this paper focuses on the integration and use of commercial space products and services, it will primarily focus on Space Force processes, without taking a wider view as to how processes in other services may impact the integration and use of commercial solutions writ large. However, the integration and use of all commercial technologies and solutions in military operations requires a focus on the same three elements—requirements, acquisition, and operationalization—herein examined.

Background on Government Use of Commercial Solutions

Integrating and using commercial space solutions is just the latest chapter in a long story about the role of the private sector in supporting the U.S. military. Until the twentieth century, military officials believed that **only government-run arsenals** should produce military munitions and weapons. As a result, at the onset of World War I, the U.S. military was not prepared to manufacture artillery, tanks, munitions, and aircraft at the needed scale, having to rely instead on industry in Great Britain and France throughout the war. Learning from this lesson, the U.S. government contracted with the private sector to build and deliver munitions, ships, aircraft, tanks, and other warfighting equipment during World War II.

Even so, the United States did not have a statutory definition of what functions had to be done by the federal government, and not private companies, until the **Federal Activities Inventory Reform (FAIR) Act** of 1998. Reflecting bipartisan consensus and public opinion, which did not support the government developing products and services that competed with the private sector, the law sought to narrowly define what only the government could do. Government leaders believed that using commercial services could save the taxpayer money, presenting an opportunity to help reign in growing federal spending.

Following enactment of the FAIR Act, officials provided further guidance on the use of commercial solutions in **Office of Budget Management Circular No. A-76** and **Federal Acquisition Regulation subpart 7.5**, making clear that the government should buy and use commercial services when they meet government needs and not automatically seek to build a government-specific solution. Though these rules apply to DOD acquisitions just as much as they do to any other federal agency, lawmakers **amended** Title 10 as part of the Federal Acquisition Streamlining Act (FASA) of 1994 to require a DOD preference for commercial solutions.

In 2016, tech startup Palantir **successfully sued** the U.S. government to be included as a bidder for work on the Army's next-generation intelligence processing and dissemination system. Palantir argued in court, and a federal judge agreed, that the U.S. Army violated FASA because it did not conduct market research to determine when commercial solutions could meet military requirements and instead unlawfully favored the acquisition of a non-commercial solution from a traditional defense contractor. Proponents for the Army's approach said that the Palantir commercial solution **could not meet** all requirements, though the then-Army Chief of Staff somewhat undermined that position when he came out as **lukewarm** about the program's capabilities. SpaceX similarly **sued** the Air Force in 2014 over its noncompetitive launch services procurement process, eventually **settling** when the Air Force agreed to offer more launches for competition.

Over the last several years, DOD has opened the aperture to look at a wide variety of commercial space solutions, including remote sensing, in-space servicing, space domain awareness, and debris removal, continuing also to acquire launch and satellite communications as commercial services. The release of two related commercial space strategy documents in April 2024—the DOD **Commercial Space Integration Strategy** and Space Force **Commercial Space Strategy**—reflect a growing urgency by DOD leaders to figure out how to better use this cornucopia of commercial space solutions. On the heels of the strategies' release, the Defense Science Board published a **report** in May 2024 with recommendations for improving the use and integration of commercial space.

Acquiring Commercial Space

Over the last few years, DOD has worked to create several procurement frameworks to get commercial space solutions quickly on contract. The Space Force is finalizing the **Commercial Augmentation Space Reserve** program, which would set up a contractual framework to seamlessly tap into commercial space capabilities during peacetime, crisis, and war. Additionally, a joint effort between the Defense Information Systems Agency and Space Force has created a **marketplace** populated by low Earth orbit commercial space offerings so that they can be easily acquired by different DOD components. Finally, Space Systems Command (SSC) **stood up** the Global Data Marketplace to provide space-based surveillance, reconnaissance and tracking solutions to military commanders. For several years, SSC has also **managed** a space domain awareness (SDA) contract, which has been **used** by the U.S. Space Command to acquire commercial SDA data.

All of these initiatives create mechanisms through which the Space Force, combatant commands, and other possible users of commercial space can quickly buy commercial space products and services. These procurement mechanisms are designed to make it easy for a potential user of commercial space to buy what is needed on a timeline that is relevant to the warfighter. But these contracts alone neither clarify how commercial space solutions meet military requirements nor ensure they were subjected to formalized system acceptance processes for operationalizing new capabilities.

How to Validate Commercial Space Solutions Meet Operational Requirements

Over the past several years, defense experts, lawmakers, and policymakers have **increasingly emphasized** the need to modernize requirements processes, in part to better take advantage of commercial products and services. Other experts have **provided** recommendations on ways to improve the military's requirements process, called the Joint Capabilities Integration and Development System (JCIDS), aiming to address concerns about its **timeliness** and **lack of focus** on joint capabilities, as well as recommendations on how modernizing JCIDS can enhance DOD's ability to **incorporate** innovation and new technologies.

This paper will not specifically examine or offer ideas to improve the JCIDS process, primarily because doing so would involve issues much broader than integrating and using commercial space. However, the paper's author echoes sentiments **expressed** in the National Defense Authorization Act for fiscal year 2024 that called for the establishment of a process within the requirements system to "rapidly validate the ability of commercial products and services to meet capability needs or opportunities." Establishing such a process would markedly improve DOD's ability to integrate and use commercial space solutions, as it would help acquisition officials pair requirements (i.e., officially validated warfighter needs) with commercial offerings.

As part of this process, before selecting an **acquisition path** to deliver a new space capability, the DOD and Space Force should take formal steps to conduct thorough market surveys, assessing whether commercial space products and services already exist to meet an operational requirement. That mechanism should also be sufficiently nuanced to identify commercial space options that meet most, but perhaps not all, operational requirements. But rather than being automatically excluded, such options should be considered, since it might make sense to accept a less-capable solution if it could be delivered sooner or modified to meet all requirements.

Given the **preference** in the U.S. Code afforded to commercial solutions, held up in court through the Palantir lawsuit in 2016, in virtually every case that a commercial space solution can meet an operational requirement, the Space Force should favor that commercial option over one developed from scratch for the government. Though DOD has a habit of creating requirements that seem designed to eliminate commercial options, commercial solutions that do not meet 100 percent of a military requirement should not automatically be ruled out of consideration. In many cases, modifying a commercial space solution rather than developing a noncommercial system from the ground up can save time and money.

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The creation of a repeatable process to assess and validate whether commercial solutions meet operational requirements should be paired with a modification to the AAF acquisition pathways, because there is no current path for commercial services intended for operations and sustainment. Relatedly, it is not clear how commercial space products that can be purchased for warfighter use without any modifications—such as SDA data or analytical insights—fit into the AAF. For either a commercial service or product, some type of effort might also be required to modify, tailor, or enhance the commercial option to meet warfighting needs. The AAF should better delineate a pathway designed for modifying a commercial space product or service—or any commercial solution, for that matter—to meet operational requirements.

In addition to deciding which current commercial solutions meet requirements, DOD should develop a way to look to the horizon, identifying and potentially shaping commercial space solutions that, when brought to market, will meet future needs. Military officials will also need adequate situational awareness of the commercial space market, relationships with space companies developing commercial services and products, and forecasting of what could be coming down the pike to help manage the balance between functions, missions, and tasks that could or might be performed commercially and those which need a government-operated capability.

Having such situational awareness is important not only for identifying new commercial solutions, but also to keep tabs on which ones become obsolete or unavailable. For example, a company providing a commercial space service used for military operations could go out of business. In such a case, the military would want as much notice as possible that it would be required to build its own capacity to provide a capability that had heretofore acquired commercially.

Operationalizing Commercial Space Solutions

A successful acquisition program produces a system that is accepted by a service branch before it enters operational use. Presumably, the Space Force would be the service operationalizing a commercial space solution, so this paper examines Space Force rules for **system acceptance**. According to those

rules, a system effectively means a product that the Space Force acquires and owns, ensuring its **fully-burdened** life-cycle costs and readiness to contribute to the joint fight. The Space Force presents a fully accepted operational system to a combatant command, part of its core mission to train, equip, and organize forces for use in joint operations.

Though more often than not the Space Force is accepting systems specifically designed for the military, the existing system acceptance process also works for commercial space products. But there is no clear, formally documented Space Force acceptance guidance that covers the use of a commercial space **service** for operational use. Operationalizing commercial services requires accepting an ongoing relationship with the commercial provider—not just for buying spare parts, but for the day-to-day use of the service, in peacetime and conflict—for the entire life of a warfighting capability. A company would be providing a warfighting capability as a service to a combatant commander and would play an ongoing role in ensuring the readiness and sustainment of a military capability.

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Acceptance processes **support** the use of commercial services for institutional use—but not operations. In many cases, this is a distinction without a difference, since institutional uses of commercial services, such as use of commercial cloud for information technology needs, directly impact the ability of military leaders to conduct operations. Beyond providing information technology services, other commercial services including satellite communications are already used in operations today. In these cases, commercial services end up being treated like commodities, available whenever needed and in whatever quantities are required by commanders.

No one in the Space Force is responsible for readiness and sustainment of commercial satellite communications. Unlike with traditional systems, the Space Force has no formal, documented role in presenting commercial space services to combatant commands. There is no application of an official, rigorous acceptance process before a commercial service is used in operations, since there is no equivalent to a systems acceptance process for a commercial service. While the Commercial Space Office (COMSO) in the Space Force has **money** to buy and **facilitate** the use of commercial space solutions, and is working with Space Command's Joint Commercial Operations (JCO) cell on ways to help integrate and use commercial space solutions in the joint force, it currently has no institutionalized role in operationalizing commercial services.

Without a Space Force process for operationalizing commercial services, full integration of commercial space into joint operations is a dangerous illusion. Without that process, no one is formally responsible for ensuring full consideration of doctrine, organization, training, materiel, leadership and education, personnel, facilities, and policy issues—**known** officially in DOD as DOTMLPF-P analysis and documentation—related to commercial space capabilities. Though the Space Force's COMSO and Space

Command's JCO are folding commercial space services into training exercises and wargaming, there are no formal mechanisms to ensure the consistent inclusion of commercial services in readiness and sustainment activities.

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On top of those concerns, without a military service agreeing to operationalize a commercial service, there will remain some ambiguity about how exactly that commercial service fits into joint operations, force management and generation, and force planning efforts. Commercial services will remain orphaned from those processes, treated as something that can be purchased off-the-shelf at whatever time and in whatever quantity is needed. So long as commercial space services are treated like commodities, commercial providers have no specific direction on how much capacity will be needed where and when, making it difficult for companies to adequately build out networks and systems to seamlessly meet warfighter needs.

Treating commercial space services as a commodity also limits DOD's role in shaping developments of commercial space services—it is left stuck with what it gets. On the contrary, DOD can influence the direction of commercial services and would be best prepared to do so if it accounts for commercial services in future force planning activities. Including providers of commercial space services in such activities can help both the military and companies better plan for next-generation services, most importantly helping companies develop services that are fully informed by the expectations of military planners.

Finally, creating a path for a service branch to certify that a commercial space solution meets a military requirement not only opens the door to operationalizing that solution but also clarifies how the military pays for operational use of commercial space—it means a service branch pays. A combatant command should not be responsible for paying, since commercial solutions should be presented to combatant commands just like any other operational capability. Operationalizing commercial space also signals to industry that recurring revenue is on the table, giving space executives confidence to make investments into commercial space capabilities with the warfighter in mind.

Conclusion

Modernizing requirements processes and creating procurement frameworks and contracts are not enough to ensure the full integration and use of commercial space. A third critical, and less discussed, step is figuring out how the Space Force operationalizes commercial services. Not doing so casts doubt on how commercial solutions could fit into readiness and sustainment activities, as well as force management and future planning. Clarifying how commercial space solutions are accepted into the Space Force also determining who should be paying (hint: Space Force and not the combatant commands).

Failure to develop a path to transition commercial space to operational use also means companies may doubt the long-term commitment of the military to buy commercial space solutions. Without that certainty, shareholders and investors may grow tired of their companies making bold, expensive bets on new solutions that can help advance U.S. national security.

Today, military leaders see the revolutionary potential of commercial space. Now is the time to match rhetoric with action and continue taking measures to lay the foundation for the successful integration and use of commercial space in the national security enterprise. ■

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