



EMBRACING SPACE INNOVATION:

A Look at Agile Acquisition in National Security Space

The responsibility of the U.S. military in National Security Space (NSS) is clear: to protect and safeguard American assets and to maintain superiority in the “high ground” of Space for the purpose of ensuring the defense of the nation’s interests both on Earth and in Space. While U.S. innovations in NSS have led the world in Space over the previous six decades, it is not immediately clear how innovation will factor into this journey as we move forward to the more-resilient and more-effective space architecture called for in the 2018 National Space Strategy. As our adversaries have demonstrated implementation of new technologies in three- to four-year timeframes, the U.S. is challenged to change 60 years of deeply-rooted acquisition approaches to respond to these emerging threats on an equal or faster timeline.

Alternative approaches for rapid acquisition and solution delivery — OTAs, NDAA section 804, SMC 2.0, SDA, RCO, etc. — as well as partnerships critical to scaling pilot programs into enterprise initiatives are still being tested. The consequences of failure at these efforts are unacceptable.

STATUS QUO: THE YESTERDAY OF SPACE-BASED ACQUISITION

Within the federal government, the Department of Defense (DoD) is emerging as a leading case study of translating innovation into action. For years, DoD helped establish a well-oiled machine of needs assessment, technological scoping, and asset delivery. This process of project execution was pivotal to key developments in space-based national defense, including the development of GPS, advanced communications, Missile Warning, and other space superiority technologies.

Acquisition of Space Systems evolved over its 60 years into a process largely defined by a serial/linear process of requirements development, an Analysis of Alternatives, a program of record creation, and by managing that program in a fashion of high-mission assurance to try to eliminate any errors. The result has been long procurements with expensive systems and exquisite capabilities that serve many of the needs of America’s space-based national security apparatus.

However, it is certain that continued adherence to existing processes will be insufficient to maintain U.S. space dominance in the decades to come. America’s adversaries are catching up and contesting U.S. footholds in the space domain. As of 2019, [China and Russia maintain the two largest foreign](#) space-system fleets, and they continue to establish themselves as rivals in deploying new space-launch and space-based services.

Tim Coffin, a retired Army Brigadier General and now chief consultant at Leidos, described the consequences of a diminished American advantage in clear terms: “Our traditional acquisition system has laid out a pathway by which we first very clearly articulate requirements. That usually takes a number of years – sometimes four or five years, or longer – just to determine the requirements for what we need to buy. With today’s technology rate-of-change, that just doesn’t work. The paradigm is no longer valid in today’s world.”

A key piece of the future acquisition and procurement puzzle is the onset of the information age – nearly every piece of military equipment, whether in the space domain or otherwise, is a sophisticated ensemble of software and qualified hardware. The integration of software and hardware (e.g., space-based systems, on-board software and firmware, ground-based TT&C, and mission planning and analysis tools supplemented by S/W-based IA and cyber security both on board the satellite and on the ground) expands and augments the capabilities of the U.S. warfighter, maintaining our national security edge and ensuring the ascendance of American power in the space frontier. However, it also raises an important question: How can defense acquisition organizations, constrained by onerous bureaucracies, operate at the pace of innovation in the information age?

According to Coffin, the solution will entail a fundamental shift in the cognitive model. A DoD organization tasked with acquiring a particular type of satellite or sustaining GPS-user equipment cannot simply provide oversight to delivering capabilities, which meet a decade-old requirement; at a more conceptual level, program offices must aid the

“CBO estimates that DoD has 22,900 military and civilian personnel who perform space-related activities. Many of those could be transferred to the new service, and thus would not affect net costs, while others may remain embedded in their existing service to integrate space into operations. In addition, CBO estimates that a Space Corps requires between 4,100 and 6,800 additional personnel for new management and support positions.”

But even the full-blown implementation of a Space Force (or Space Corps, or any other iteration of this entity) contained in the grandest visions of the President and Vice President likely would not solve the problem of acquisition stagnation in one fell swoop. Additionally, that is almost certainly not the version of Space Force that is slated for approval by Congress. In the scenario most likely to gain Congressional approval, an exacting budget constraint will seriously diminish the scope of what tools are attainable. As a result, ‘source’ agencies and organizations that will form the foundation of Space Force’s personnel and technology will be drawn on to provide resources, sometimes with considerable reluctance. In other words, the reshuffle may not be sufficient to meet the standards of change encouraged by Coffin and others.



development of more robust and resilient warfighting capabilities relative to America's adversaries. Whether the capability serves a standalone function in safeguarding a constellation of satellites, increases the resiliency of command and control, or delivers reconnaissance and remote sensing capabilities, the chief concern can and should be the enhancement of capabilities relative to that of our adversaries.

Coffin says there's a gap between where we are and where we need to be: "We need a process that evolves with the threat, and that means changing the acquisition process, because if your acquisition is focused on meeting the requirements articulated maybe a decade ago, it's always going to be behind the need and not capable of addressing the situation currently at hand and certainly won't posture us for success in a rapidly evolving future."

SHIFTING TIDES: WHAT IS DRIVING CHANGES TO THE SPACE STATUS QUO?

Our adversaries have spoken; and we will either respond to the challenge or cede our authority as the leader in Space.

This is more than a desire to accelerate the acquisition cycle; it is essential to our ability to maintain our position in Space. The mandate is being aggravated by two developments. First, it has become clear that the years of embedded processes we have translated into the space-acquisition process are no longer sufficient. Second, America's potential adversaries — such as Russia and China — are accelerating technology development by accepting greater risk tolerance and leveraging commercial technologies to deliver military needs. The result is adversaries who have rapidly developed capabilities that not only threaten U.S. military and civilian assets on the ground, but can also pose a direct challenge to American interests in Space through a wide range of capabilities including: jamming, cyber assaults, directed energy attack, and even ground-based ASAT weapons. In other words, it is now easier and cheaper to move from idea to executable weapon in the space domain than ever before.

All the military services have a stake in this fight. While the Air Force (and perhaps future Space Force),

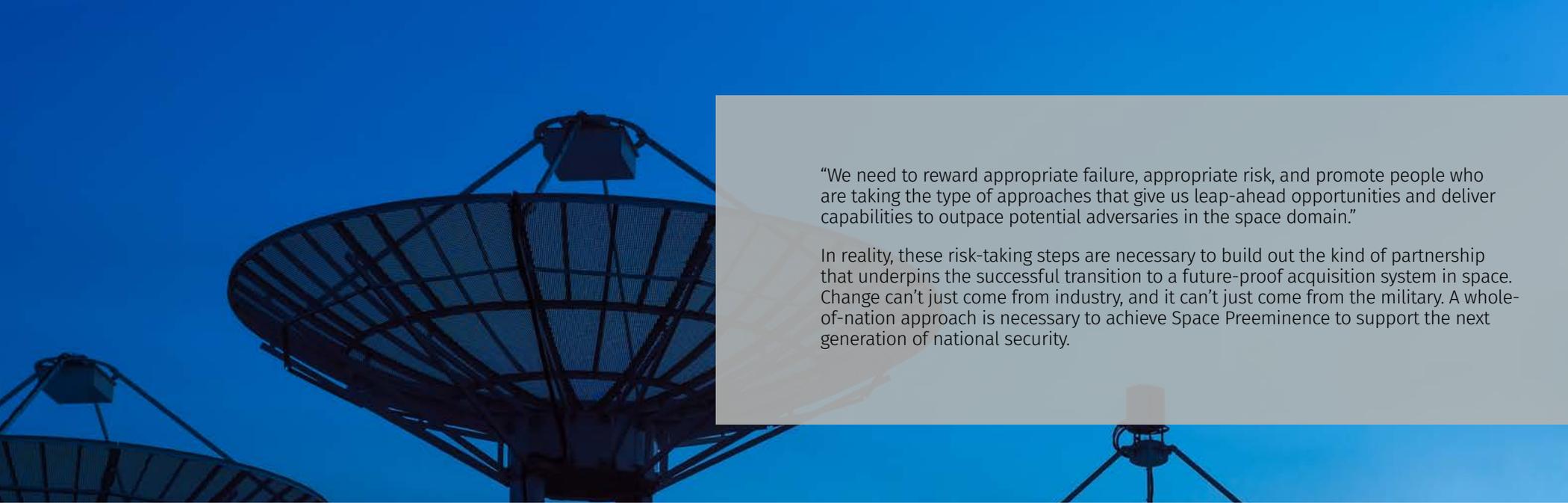
along with the NRO, acquires and operates the vast majority of space assets and capabilities, the Army, Navy, and Marine Corps also depend significantly on these capabilities. Consequently, systems need to be responsive to the services' evolving needs, protect them against emerging threats, and provide mission assurance by assuring availability in a more-threatened and contested environment than we have ever seen before.

Unfortunately, the technical improvements that might benefit space-based acquisition are still subject to fragmented organizational structures. As Coffin sees it, acquisition lanes, stovepiped processes, regulations, personnel policies, training, and culture have entangled the acquisition process to such a degree that suboptimal solutions are guaranteed. The result impacts warfighters from every service and limits U.S. freedom of action not only in Space, but hobbles the other geographic combatant commands, as well. Past experience shows that opportunities to deliver greater capabilities for the nation have been gutted or derailed to keep the existing acquisition train on its plodding and unproductive-but-"safe" path.

Proponents of ongoing revisions to America's national security space apparatus hope that many interfaces, competing requirements, and constituencies will be addressed through the NDAA Space Force initiative. The consolidation of these requirements and needs under the leadership of a single "[chain of command](#)" will enable more streamlined, "operational" decision making which can position the U.S. in a more advantageous position relative to its adversaries. Although consolidation will simplify the operational aspect, it is not a panacea for all the acquisition challenges. An integrated Space Force must still contend with acquisition challenges of non-responsive schedules, costs for acquisition of space capabilities, and the ability to move acquisition at a pace that surpasses the speed of our adversaries.

LOOKING THROUGH THE WINDOW: HOW CAN SPACE-BASED ACQUISITION BE ACCELERATED TO THE PACE OF TODAY'S TECHNOLOGICAL INNOVATION?

Coffin believes the U.S. has run out of alternatives,



“We need to reward appropriate failure, appropriate risk, and promote people who are taking the type of approaches that give us leap-ahead opportunities and deliver capabilities to outpace potential adversaries in the space domain.”

In reality, these risk-taking steps are necessary to build out the kind of partnership that underpins the successful transition to a future-proof acquisition system in space. Change can't just come from industry, and it can't just come from the military. A whole-of-nation approach is necessary to achieve Space Preeminence to support the next generation of national security.

and that speed is paramount to success. “Space and threats to our space capabilities are real. We have no option but to respond, and to do this in a rapid-response fashion. The threats will continue to evolve, and we cannot just respond to the current threats, but we must be agile enough to respond to future emerging threats. This is our new normal, and we need to have a new normal to ensure our space superiority.”

He also believes we must solve these challenges in an economically-intelligent fashion, as budgets will likely be a challenging element to our response. For example, some estimate the cost of creating a Space Force will range between [\\$3.6 billion and \\$13 billion](#). Still, the cost of not making this investment is considerably greater: for example, [CSIS estimates](#) that a failure to develop and acquire space weapons can result in action scenarios that can potentially harm American space assets.

To make space defense the most worthwhile pursuit possible, and in order to prevent the bottlenecking of crucial space-dedicated cyber and physical assets, Coffin charts several potential revisions: “In the thirty-five years of my government life, I was very used to having interchanges with other government agencies,

discussions of what technology was out there, where technology was going, how it was developing, whether it was useful or not to emerging operational needs and what changes in it would be required to make it useful in the current acquisition climate. Under today's acquisition rules (or the legal interpretation of the rules) you often are not allowed to have a conversation about ideas, technology, and changes that would make the space technology more useful, resilient, and valuable to the user. We often try to meet all of our capability requirements in one package with the expectation for industry to deliver a solution five to 10 years down the road.”

Coffin shares a lesson that has been well-integrated into acquisition processes in the private sector but still needs more support in government – that is, the centrality of risk in any learning-based process. “It gives you the opportunity to fail, and I think the opportunity to fail is very important,” Coffin begins. “We've taken the ability to fail and survive away from most of our program managers. Not taking risk is rewarded versus taking appropriate risks to reach for capabilities that may provide a tremendous return on investment. Currently, if a PM takes that risk

and fails, we terminate their career and call them a failure. There's a cultural side of this that may be even more difficult to change because we need to reward appropriate risk, and even appropriate failure, by promoting acquisition professionals who will push the boundaries of conventional processes to outpace potential adversaries in the space domain.”

CONCLUSION

The current space-acquisition bureaucracy evolved over 60 years, with processes and reviews continually being added but rarely, if ever, removed, and it must undergo fundamental changes and a total relook. Current and emerging critical threats to national security must be addressed immediately. While the U.S. still enjoys relative dominance in the space-based warfighting frontier, that position is rapidly eroding as adversaries take greater advantage of our outdated processes when deploying their own advancements. Now is the time to make sure such processes receive a needed overhaul so our forces can deliver and deploy innovations at scale and speed. Now is the time to send a message that future American dominance in Space is not up for debate.