



CENTER FOR THE STUDY OF THE  
PRESIDENCY & CONGRESS

---

# MAINTAINING MOMENTUM IN NATIONAL SECURITY SPACE

---

MAY 2021

---



The Center for the Study of the Presidency and Congress, founded in 1965, is a nonprofit, nonpartisan 501(c)(3) organization. The Center's mission is to utilize the lessons of history to address the challenges of today; serve as a strategic honest broker for discussions with leaders from government, the private sector, and the policy community; and to educate the next generation of leaders through the Presidential and International Fellows Program.

**MAINTAINING MOMENTUM IN NATIONAL SECURITY SPACE  
RECOMMENDATIONS TO THE BIDEN-HARRIS ADMINISTRATION  
May 2021**

Copyright © 2021 CENTER FOR THE STUDY OF THE PRESIDENCY & CONGRESS

This report, or portions therein, may be shared or reproduced with proper citation. No portion of this report may be altered, by any process or technique, without the express written consent of the publisher.

Published in the United States of America.



**CENTER FOR THE STUDY OF THE  
PRESIDENCY & CONGRESS**

601 13<sup>th</sup> Street, NW – Suite 1050N  
Washington, DC 20005  
Phone: 202-872-9800  
Fax: 202-872-9811  
[www.thePresidency.org](http://www.thePresidency.org)

Copyright © 2021



# CENTER FOR THE STUDY OF THE PRESIDENCY & CONGRESS

## **MAINTAINING MOMENTUM IN NATIONAL SECURITY SPACE** RECOMMENDATIONS FOR THE BIDEN-HARRIS ADMINISTRATION

### CSPC NATIONAL SECURITY SPACE PROGRAM

May 2021

The Honorable Glenn Nye  
*CSPC President & CEO*

The Honorable Mike Rogers  
*CSPC David M. Abshire Chair*

Joshua Huminski  
*Director, Mike Rogers Center for Intelligence & Global Affairs*  
*Director, National Security Space Program*

Dan Mahaffee  
*CSPC Senior Vice President, Director of Policy*

Michelle Miller  
*Executive Assistant to the Honorable Mike Rogers*

Jamil Jaffer  
*Founder & Executive Director,*  
*The National Security Institute at George Mason University's Antonin Scalia Law School*

Ethan Brown  
*Senior Fellow for National Security Studies*

Andy Keiser  
*Senior Advisor*

James Kitfield  
*Senior Fellow*

Michael Stecher  
*Senior Advisor*

# TABLE OF CONTENTS

<b>Executive Summary</b> .....	<b>1</b>
<b>Strategic Context</b> .....	<b>4</b>
Global Threats and Challenges .....	4
Strategic Partnerships .....	5
The U.S. Space Force and U.S. Space Command .....	5
Build the Space Systems of the Future .....	6
<b>Recommendations</b> .....	<b>8</b>
Developing & Growing the Space Force .....	8
Acquisition Reform .....	11
Encouraging Competition .....	14
A Complete Space Ecosystem .....	18
Establishing Rules & Norms .....	21
<b>Letter from the Co-Chairs</b> .....	<b>23</b>
Acknowledgments .....	24
<b>Program Supporters</b> .....	<b>25</b>



## EXECUTIVE SUMMARY



*Space Force Flag Unveiled at the White House (White House Photo)*

In the year since the establishment of the U.S. Space Force, the newest service worked diligently to define its unique culture, to build up its structure, to recruit new personnel from the public and other branches, and to map out its mission. While this progress is laudable and impressive, much work remains to be done in terms of the service—addressing key issues that led to its establishment, not the least of which is acquisition—as well as the broader national security space enterprise.

It is critical that the inertia and momentum that led to the service’s establishment and the renewed focus on the space enterprise writ large not be lost. Since the publication of the first National Security Space Program report, the Center for the Study of the Presidency & Congress (CSPC) convened over a dozen roundtables and events, bringing together over 200 experts from across government, private, academia, and non-profit sectors to look at necessary reforms to enhance and strengthen America’s position in space.

The report that follows offers a series of critical recommendations to enhance the national security space enterprise by making it more competitive, more responsive, and more closely tied to the national security strategy of the United States. It is no longer sufficient to view space as a separate, disconnected domain from the broader national security and foreign policy mission. The United States must take the lead in establishing an American-led, rules-based, multilateral order on-orbit, and to do so it must ensure that it maintains the preponderance of space power. Doing so requires revisiting the old models and adopting new ways of thinking, ways that match the speed of innovation of the private sector with the speed of acquisition.

The speed at which America’s adversaries are moving is outpacing the ability of institutions to adapt, plan, acquire, and field new capabilities. If America is to maintain its competitive advantage on orbit, the following actions must be undertaken.

## **The next administration should maintain the momentum of the development and growth of the Space Force**

While the service's future may be settled, the critical work of the service's establishment and addressing the reasons for its creation remains unfinished. The Biden administration should not lose focus on national security space and must press the service to address the underlying—and Pentagon-wide—issues of acquisition reform. The Space Force must also educate the new Congress and the broader public as to the importance of space to the American way of life and the threats America faces on-orbit. Doing so necessitates revisiting the classification of space-related information to communicate more clearly to both the American people and America's adversaries. Ensuring proper coordination within and across the government is critical to meeting the national security space mission, just as it is critical to coordinating the civil and scientific missions. Here, the administration would be best served by keeping the National Space Council as it now appears to be intending to do.



*U.S. Space Force Chief of Space Operations Gen. John W. Raymond speaks at the Pentagon on March 27, 2020. (U.S. Air Force)*

## **Acquisition reform must move beyond the edges to the core programs of record**

If the Space Force does not address the underlying issue of acquisition reform, America will lose its competitive edge in space. True reform means going beyond simply shaving time off existing acquisition cycles and instead revamping what things are bought and the way they are bought. Here, the government must define an innovation pathway that takes capabilities or assets from experiment through to a program of record. Allowing innovation to die in the acquisition valley of death is no longer acceptable. This necessitates making real and substantive changes to the acquisition process to make it faster, more competitive, and resilient.



*The Launch and Recovery of a SpaceX Falcon 9 Starlink Mission (SpaceX)*

**The Space Force and Intelligence Community must encourage competition within and amongst space access providers to ensure a persistent American presence on orbit**

The commercial space sector has radically reshaped the way countries and companies access space, yet the old model of block-buys, multi-year contracts, and nearly bespoke vehicles remains. This must end. The military and Intelligence Community would be better served by increased competition within and amongst launch providers. Artificially locking in development to specific launch vehicles does not make sense when there is a growing ecosystem of launch platforms and the potential for future on-orbit solutions. Here, changing the definition of what constitutes “assured access” must also change. Having assured access must mean more than dedicated launch providers and take on a more robust meaning.

**The national security space enterprise must treat space as a complete ecosystem**

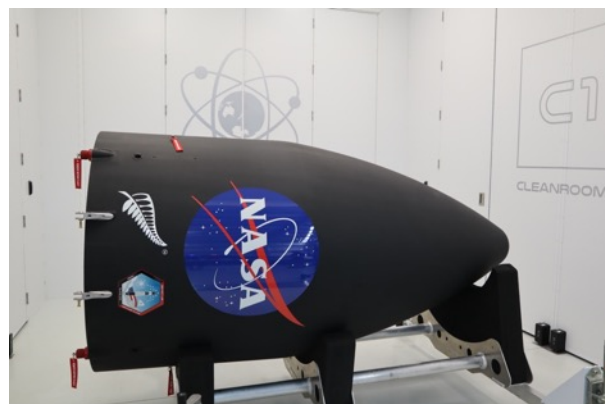


*Nanoracks CubeSat deployer releasing early Dove Satellite (Nanoracks)*

Space is integrated into every aspect of American public life and national and economic security. This integration must be reflected in how the national security space enterprise approaches space-based and space-enabled capabilities. It must look to close the “kill chain” by viewing space as a system. This necessitates an approach to acquisition that focuses on capabilities rather than platforms. Doing so will allow the commercial sector to innovate new and novel solutions to the military’s problems. Moreover, doing so will help sustain the growth of the emerging space eco-system, a critical development if America is to maintain its competitive edge.

**Take the necessary steps to establish a United States-led multilateral rules-based order for orbit and other planetary bodies including the Moon**

The goal of the United States must be to establish a rules-based, multilateral order for orbit and other planetary bodies. Doing so requires the coordination of the Departments of State, Transportation, and Commerce, along with NASA, and other U.S. government entities. This also necessitates the coordination of efforts and policies with America’s critical allies and partners. Failing to do so will cede the initiative to China, something which the United States cannot afford.



*Rocket Lab Cleanroom for NASA ELaNa-19 mission (Rocket Lab)*

## STRATEGIC CONTEXT

Space is embedded in every aspect of human life, from safety and security to prosperity and growth. In fact, at no point in human history has society relied more on space for its safety, security, and prosperity. While that is true of the present, our future is even brighter. Ideas that once seemed fantastical and futuristic are closer than ever to becoming reality. In this decade the dream of humans living, working, and building in the vacuum of space, and exploring and settling on the moon and beyond, will be well within reach.

This moment of opportunity, however, comes with increased risks of instability and conflict. After witnessing U.S. achievements in space, other countries now seek to develop similar capabilities, while U.S. adversaries work to challenge America's position. As technology advances, the barriers to entry continue to be lowered, and the gap between the United States' position and that of its adversaries closes. The rapid advancements of potential adversaries highlight the need to protect America's economic and scientific interests, and to ensure the freedom of navigation for all in-earth orbit and beyond. These global changes only increase the need for a flexible, agile, and responsive suite of space capabilities. If space security is compromised, modern life as we have come to know it can no longer be guaranteed.

This rapidly changing landscape necessitates new ways of thinking and novel approaches to the unique challenges we face in the space domain. Legacy methods and models of operation that brought us to this point are ill-suited for the future. Meeting future security demands will require new operating concepts and an agile posture able to quickly deploy commercial innovations. Existing commercial, civil, and defense architectures need to be updated. Integrating these advances will allow swift responses, ensuring that the United States can successfully operate in and from a contested domain.

These advances are worth pursuing in their own right, yet when combined as part of a whole-of-government and whole-of-nation approach to national security space, they represent a sea change in the space culture and ecosystem—a change necessary to ensure U.S. dominance and leadership in space.

### *Global Threats and Challenges*

After seeing the profound impact of U.S. space-based and space-enabled capabilities on the battlefield—along with the benefits of leveraging space-borne capabilities for our domestic economy—adversaries now seek to counter America's strengths and develop their own space assets. Russia and China have undercut the United States' technological advantage, for instance, by exploiting perceived weaknesses, including the acquisition of intellectual property by financial and illicit means. The military doctrines of Moscow and Beijing (as well as many other countries) reveal that they view space as central to modern information-dependent warfare, and have identified counter-space capabilities as a means to reduce U.S. and allied economic and security effectiveness. In addition, the proliferation of space capabilities creates the risk of an ungoverned domain with increased opportunities for collisions and accidents on orbit.



The United States' great power adversaries aspire to reclaim a larger role in the world, a role that can only occur if our strength diminishes. Should the United States fail to meet this challenge and keep pace with global innovation, the consequences would be immediate and dire. Our adversaries have embraced aggressive programs to enhance their presence and strength in space. They are innovating and adapting complex space-based capabilities at a rapid pace enabled by their centralized strategic military planning and expenditures. By contrast, the United States' military complex is constrained by a cumbersome, risk-averse development and acquisition system that measures progress in years, if not decades. Our adversaries' willingness to experiment, fail, learn, and rapidly course-correct presents an immediate threat to America's leadership in space, and our nation must adapt to meet this challenge.

## *Strategic Partnerships*



*The Headquarters of Space and Missile Systems Center in Los Angeles, California*

To compete, deter, and win against its adversaries, the U.S. national security space enterprise must adopt a whole-of-government and whole-of-nation approach, and alongside allies and partners ensure that space does not become ungoverned and ultimately ungovernable domain. To successfully compete on-orbit, the national security space enterprise must also have strong partnerships with commercial organizations and academia.

A close partnership with the commercial industry that includes the tangible nurturing and encouragement of continued innovation in that sector is critical to victory. To succeed, the entirety of the U.S. space enterprise must change the way it

does business with the commercial sector, matching its speed of innovation with the government's speed of contracting, integration, and full adoption. Action is faster than reaction, and as such, the U.S. space enterprise must proactively build and maintain strategic partnerships and take the initiative to deter adversaries from malicious activity.

## *The U.S. Space Force and U.S. Space Command*

Within the Department of Defense, the Space Force is now the preeminent military entity tasked with organizing, training, and equipping our warfighters with critical space-enabled capabilities. However, it is not the only entity, nor can it function alone. To ensure success, the Space Force must rely on and achieve unity of mission through partnerships with the broader Intelligence Community, commercial space organizations, civil space agencies, and allies. The Space Force must leverage these partnerships to create the civil, commercial, and military conditions necessary for success.



*The official flag of the newly-revived U.S. Space Command (White House Photo)*

In this joint campaign, the Space Force will work with, complement, and fight alongside the Army, Navy, Marines, and Air Force. Much of this operational support will be executed through the re-established combatant command, U.S. Space Command. The Space Force must also establish deep and close partnerships as a new member of the Intelligence Community, as well as with allied services and governments.

Leveraging these allies and partners, and integrating them into planning and operations, is critical to strengthening the capabilities of the United States and defining an American-led, rules-based order for orbit.

A renewed focus on interoperability and data sharing will be critical to ensure continued success. Allies and partners who are actively expanding their defense space programs present opportunities to increase defense collaboration and cooperation.

## *Build the Space Systems of the Future*



*A Test of Blue Origin's BE-4 Engine*

Relying on the architectures and technologies of today is insufficient to ensure America's national and economic security tomorrow. The Space Force, while executing the joint warfighting mission and meeting national needs today, must build the structures necessary for tomorrow's success. This necessitates anticipating the threat, leveraging next-generation technologies, and continuously evolving. The force of today and tomorrow must be agile, anticipatory, responsive, flexible, and adaptable.

The new administration must prioritize continued and sustained investment in next-generation systems and technologies. This requires a change not only in how space assets are bought but also in what is bought. Key innovations explored by new entrants to the commercial market must be identified and nurtured to fruition. Small, ambitious businesses should be recognized as key sources of potential game-changing capability. As such, the U.S. space enterprise must adapt its contracting infrastructure to assist strategic new businesses on their path to prototyping and ultimately deployment. It is insufficient to change contracting processes if the outcome is that legacy providers continue to slow the pace and increase the cost of innovation.

The national security space community, and in particular the Space Force, must work aggressively and strategically with commercial partners to integrate new and emerging capabilities, leverage

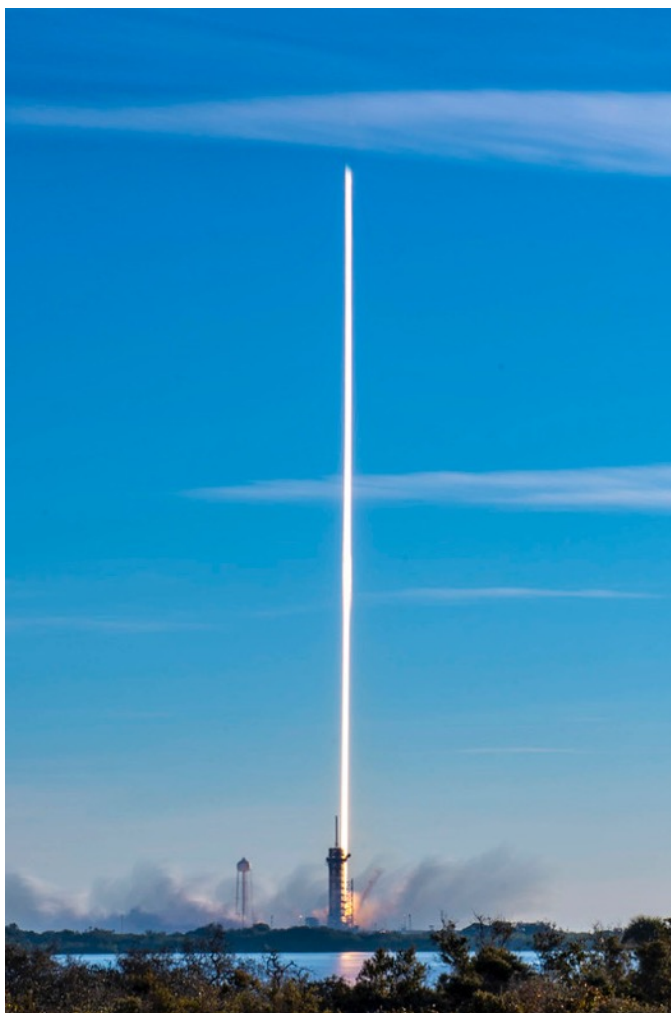
and support innovation, and respond intelligently to the rapidly changing technological landscape.

As evidenced by the commercial space revolution, new and emerging capabilities are deployed daily—small satellites, mega-constellations, economical rideshares, dedicated small launches, reusable rockets and spacecraft, and more—and are revolutionizing the way nations access space and what they can do on-orbit. Notably, significant private sector investments are bolstering the U.S. commercial space sector across these segments, mitigating the need for direct government investment. The government must seize on this revolution by actively engaging the commercial sector. Failure to do so cedes the advantage to our adversaries.

The Department of Defense and the Intelligence Community must look at the totality of the space ecosystem, not just the platforms. This includes the role of private sector investment, which most efficiently validates sustainable technologies and indicates the viability of private companies. The Government must change its thinking from lone satellites or single streams of service and look instead at the entirety of the mission architecture.

The Space Force must answer critical questions: how does it win the joint fight? What does the warfighter need on the ground? What is the best way to meet that mission? How does that capability integrate with the warfighter? The focus must be on treating space capabilities as a system, essentially closing the “kill chain” in space, and not just on the solitary platform. The government must determine what capabilities are needed in and from space, and what is the best and most efficient way to acquire those capabilities?

Thinking of space in terms of an integrated ecosystem must also extend to resiliency and reliability. With the new and emerging capabilities described above, metrics traditionally focused on single platforms should be adapted to consider complete systems. By assessing new capabilities at the system level, Space Force can leverage the emerging capabilities, distribute assets across resilient and replacable platforms, thereby ensuring capability survivability in a conflict at a cheaper cost and with a more frequent technology refresh rate.



*A SpaceX Falcon 9 Starlink Mission Launches from Kennedy Space Center (SpaceX)*

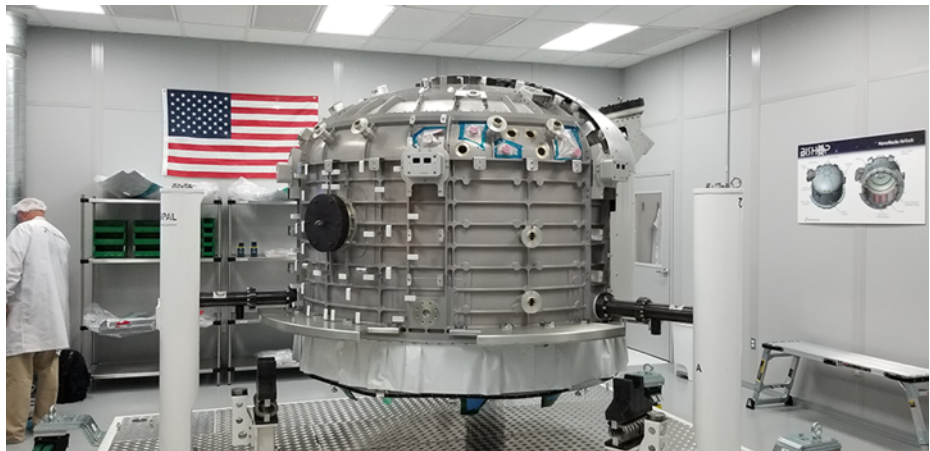
# RECOMMENDATIONS

## *Developing & Growing the Space Force*

### **1. The next administration should maintain the momentum of the development and growth of the Space Force**

With the apparent endorsement of President Joe Biden, it appears that the future of the Space Force is now no longer in question. Indeed, the intellectual foundations for the Space Force preceded the Trump administration, and the threat and the challenges the service is intended to address will continue. The threat that birthed the Space Force has not ebbed, and will undoubtedly increase in the coming years. Beijing aims to establish its own order in near-earth orbit, cis-lunar space, and beyond, for instance, including establishing a crewed, permanent presence on the Moon. The Space Force is needed to protect America’s on-orbit interests and help define an American-led, rules-based order in space.

The greatest current challenge is to ensure that the spirit of innovation, the drive for change, and the opportunity to create the service of the future are not hindered by the sclerosis of existing architectures. While the Space Force has made significant progress in the near-



*Nanoracks Bishop Airlock in construction, showing wiring and interfaces (Nanoracks)*

term in establishing its culture and setting up a unique “delta” structure and rank system, key elements of acquisition reform and over-the-horizon thinking and planning remain unfinished. In the absence of consistent attention and direction from the White House, the Space Force could lose its initiative and settle on the old ways of doing business. The country simply cannot afford such a loss of initiative in the space enterprise. What is needed is not merely a Space Command of old but a truly forward-looking and innovative service that meets the needs of the warfighter today, that plans, acquires, and builds for a competitive future.

### *Educate Congress & the Public on the Threat*

The Space Force and Biden administration officials have a critical task in educating Congress and the American public about the threats in space and the opportunities presented by operating on-



orbit. This is necessary not only to ensure sustained support for the service but also to attract the next generation of space professionals to national security space.

With the daily lives of the American public reliant on space-borne assets, the consequences of losing those capabilities would be a profound disruption to our national and economic security. Most Americans do not appreciate all the benefits of space, however, or understand how it affects their livelihoods. The consequences of this ignorance are potentially dire.



*Electron's nine Rutherford engines during lift-off of the successful 'Return to Sender' first recovery mission (Rocket Lab)*

Part of the problem is that, unlike ground, sea, or air-based capabilities, there is little tangible, physical evidence of space capabilities or space-enabled effects. There are no battlefields anyone can point to or visible demonstrations of capacity beyond an occasional rocket launch, impressive as that may be. If the American people do not understand or appreciate the impact of space or the risks of on-orbit failure, how can Congress be expected to support the Space Force accordingly?

With the influx of new members in the House and Senate and the arrival of a new administration, it is all the more important that Space Force officials get ahead of the curve and inform and educate Congress and the public of the service's mission, the threats the United States faces, and how the service will be different—delivering better, faster, more effective capabilities to the warfighter.

### *Reevaluate Classification Levels to Communicate Capabilities & Threats to Domestic & Foreign Audiences*

This education responsibility also necessitates a reevaluation of the classification and indeed over-classification of national security space information. The over-classification of national security-related space information not only inhibits a serious public conversation about the threats and challenges on-orbit but also America's ability to respond to these challenges. At the same time, over-classification prevents the commercial space industry from competing on an even playing field with the current Defense Industrial Base, artificially constraining new entrants into the national security space. Equally, the commercial space industry must be made a security partner to avoid foreign intrusion and intellectual property acquisition through either industrial espionage or foreign acquisitions.



*Chief Master Sgt. Roger Towberman displays his insignia during a presentation of the United States Space Force flag in the Oval Office of the White House (Getty Photos)*

*Continue to Support and Operate the National Space Council*

The White House's expected continuation of the National Space Council is a wise decision and one this report fully endorses. While some have argued that the work level is not all that different from previous inter-agency activities—just seven National Space Policy Directives—it serves a critical function in elevating both the dialogue around, and awareness of the policy challenges to a higher level, while distilling that information with a single, clear voice. The National Space Council has also provided a forum through which the private sector can better engage with the government, bypassing existing bureaucratic red tape to participate in a key and critical dialogue. Additionally, on the international stage, the preservation of the Council would signal to allies and adversaries alike that space policy is and will remain a priority for the administration. As such the Council should continue.

## Acquisition Reform

### **2. Acquisition reform must move beyond the edges to the core programs of record**

The Space Force and the Air Force have made notable strides in improving acquisition, but these efforts remain at the edge of the process and have yet to affect either the core acquisition system or the programs of record. This shortcoming must be addressed, as it affects the entirety of the Department of Defense acquisition process.

The Space Pitch Day<sup>1</sup>, the International Space Pitch Day<sup>2</sup>, AFWERX<sup>3</sup>, and other reform drivers are all great examples of the services leaning forward to acquire novel capabilities faster and more efficiently. These are small-dollar contract vehicles designed to bring small businesses into the national security space enterprise or provide seed funding for prototypes, all of which are to be welcomed. The Space Development Agency, Space RCO, the Space Enterprise Consortium (SpEC)<sup>4</sup>, and others are working with great purpose and speed to acquire and field novel capabilities, but they often struggle to secure buy-in and support from an ossified bureaucracy.



*Blue Origin's New Shepard Booster Landing*

---

<sup>1</sup> <https://www.af.mil/News/Article-Display/Article/2012708/space-pitch-day-yields-innovative-technologies-and-new-partners-for-the-air-for/>

<sup>2</sup> <https://www.losangeles.spaceforce.mil/About-Us/Space-Force-Pitch-Day/>

<sup>3</sup> <https://www.afwerx.af.mil/>

<sup>4</sup> <https://space-enterprise.org/>

### Define an “Innovation Pathway” from Experiment to Program of Record

A viable path from start-up to a program of record has yet to be charted, and this remains a significant obstacle to entry. Such a critical path of innovation must be established for the United States to remain competitive with our rapidly innovating adversaries who are capable of deploying innovations from laboratories to the battlefield within months, not decades. Similar streamlining must also come to define the core of the U.S. national security space enterprise. Failure to do so will leave novel capabilities stalled at the prototype or testing stage, possibly exposing them to acquisition by foreign entities, in some cases by the exact adversaries the United States intends to deter.



*Concept of Nanoracks' Outpost Designed for National Security Missions (Nanoracks)*

Creating a process whereby initial investments have gates or milestones for advancement that facilitate integration into the wider enterprise will create incentives for commercial partners (and indeed small start-ups) to work with the national security enterprise as a whole. Changes designed to accelerate Space Force acquisitions (and indeed Department of Defense acquisitions writ large) and make them more experimental, adaptive, and innovative must be brought from the periphery to the core, otherwise, the overall national security space enterprise will continue to stumble along its current path, overburdened by bureaucracy and red tape.

Of course, there remains a need for continued acquisition of unique, one-off systems for which there is only a government customer. The slow, bureaucratic, and often byzantine acquisitions process that undergirds these unique systems, however, is unsustainable for the space enterprise as a whole in the face of rapidly developing, increasingly adaptive adversaries.

### Make Real & Substantive Changes to the Acquisition Process

Adjusting the margins and shaving a month or two off a multi-year acquisition program is insufficient to the challenge the U.S. space enterprise confronts. Getting the same equipment and capabilities, only slightly faster and at an equal price, is not enough progress. Fundamentally changing what is bought, and how it is bought, is the only pathway to long-term resiliency on orbit.





*Concept Art for Blue Origin's New Glenn Heavy Lift Rocket*

The recently announced awarding of the Next Generation Overhead Persistent Infrared<sup>5</sup> satellites is a fitting example—five satellites to be deployed by 2028, the earliest of which may fly by 2025, at a cost of nearly \$9 billion. While the award may have been “swifter” than previous competitions, it by no means leverages next-generation capabilities, mega-constellations, or other cutting-edge technologies. If anything, it is a continuation of the deployment of “juicy targets,” in the words of Gen. John Hyten, the vice chairman of the Joint Chiefs of Staff and previous commander of U.S. Strategic Command. Beyond delivering “juicy targets,” continuing this approach reduces the nation’s ability to experiment with new systems and deploy new capabilities quickly, allowing adversaries to turn inside our acquisition cycle.

Indeed, while the Space Force is defining its own culture, nomenclature, and heraldry—e.g. “Deltas” instead of “Wings”—if it fails to reform fundamental processes and structures, little will have ultimately changed. It is insufficient to rebrand Space and Missile Systems Center (SMC) as Space Systems Command, for instance, without actually changing what is bought, how it is bought, and who is responsible for its purchase. Reform cannot be held hostage by personalities, offices, or the mantra that “this is the way we do business.” If the broader, static environment is not changed, and if the large dollar items are not adjusted, small bets such as those made by AFWERX and SpEC will have little chance of transitioning beyond the early stages of development and achieving big payoffs.

---

<sup>5</sup> Sandra Erwin, “Lockheed Martin Gets \$4.9 Billion Contract To Build Three Missile-Warning Satellites For U.S. Space Force”. Space News, January 4, 2021, <https://spacenews.com/lockheed-martin-gets-4-9-billion-contract-to-build-three-missile-warning-satellites/>

## Encouraging Competition

### **3. The Space Force and Intelligence Community must encourage competition within and amongst space access providers to ensure a persistent American presence on orbit**

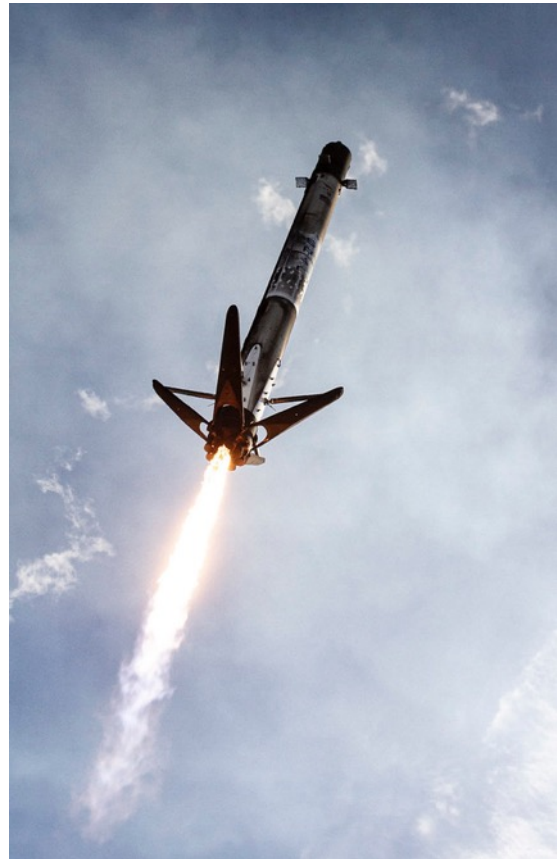
If the national security space enterprise is to truly build effective space access for the future, it must abandon outdated modes of operation and thought patterns, particularly in the realm of traditional launch. The space access landscape is increasingly competitive and offers novel capabilities to diverse orbits at a fraction of the traditional cost.

In CSPC's first report this was a top-line recommendation and it still stands. The proliferation of launch options and easier space access means that more diverse opportunities are available for the Space Force and the national security space enterprise writ large. It no longer makes sense to tie the entirety of the architecture to one class of launch vehicles hamstrung by unique or bespoke government requirements. Diversification of the supply chain will also yield resiliency in times of crisis when immovable or centralized launch sites may be threatened or out of commission. Achieving this diversity requires the development and deployment of on-orbit solutions, in addition to the diversification of launch locations and vehicles.

Additionally, the Government should not implement market-distorting policies, such as creating “dedicated” programs for the sole purpose of artificially supporting one solution over another. Rather, the Government should prioritize the best technical solution, affordability, and schedule—making providers “race to the top” to meet those requirements.

#### Field an ID/IQ Model for Launch

As the space economy grows and matures, the Government must shift away from being *the* launch customer to *one among several space access* customers. In such an environment, competition is key. CSPC's recommendation from the first report remains as applicable and appropriate for the Space Force as it did for the Air Force.



*SpaceX' Falcon 9 Booster Returning to Earth (SpaceX)*

Under a space access-as-a-service program, companies will qualify and compete for launches and in-space transportation on an ID/IQ<sup>6</sup> basis. The Government will certify that vendors meet agreed-upon base standards for mission assurance, capability, and business capacity. Upon winning the base ID/IQ contract, companies will then compete for mission “task orders.” This model is proving successful for NASA’s Launch Service Program (LSP) and should inform future planning for the Space Force. The National Reconnaissance Office is also working toward a more agile model of launch-as-a-service, which, if both efforts remain successful, could serve as a model for the broader Department of Defense launch enterprise.

Such an approach allows the Government to benefit from increased competition amongst space access providers, with prices driven down but quality remaining high, as companies that fail to meet established standards and/or reliability will prove uncompetitive. This mechanism also allows the Government to incentivize performance. Bonuses could be awarded, for example, for vendors who get to orbit faster and with higher assurance, or who provide other additional capabilities. Conversely, vendors that fail to meet the requirements are removed from the contract.<sup>7</sup>

This approach also allows space access providers to compete on cost and differentiating factors while significantly speeding up acquisition and time-to-orbit, versus the current acquisition model which treats each new space access system as an individual program to be evaluated and re-evaluated as major improvements are made.



*Blue Origin’s New Shepard Launching from West Texas, as Viewed from an Overflying Drone*

---

<sup>6</sup> Indefinite Delivery/Indefinite Quantity

<sup>7</sup> NASA’s Commercial Orbital Transportation Services (COTS) model is an example of this approach.  
<https://www.nasa.gov/content/cots-final-report>



For commercial space, this would offer multiple benefits—a guaranteed customer in the government, a “seal of approval” for the commercial market, and the same economies of scale noted above.

At the same time, the Space Force should reassess the process to compete in the National Security Space Launch Program (NSSLP) to increase efficiency and effectiveness. Unique Government requirements inapplicable to commercial business, such as vertical payload integration, mandated launch locations, and onerous mission assurance requirements, artificially limit competition and innovation at a time when both are critical to maintaining America’s edge. The NSSLP should be re-structured away from the “high walls” of five-year, block buys, splitting NSS access to space among a duopoly of only two protected incumbents, and should instead compete for missions on an open basis.

*Change the Definition and Meaning of “Assured Access to Space”*

Congress should also change the decades-old definition of “assured access to space”, which no longer reflects the new, contested space domain and the emergence of the commercial launch sector. It is no longer sufficient to define “assured access” to mean<sup>8</sup> “the availability of at least two

*Successful lift-off of Rocket Lab's 14th Electron launch vehicle for the 'I Can't Believe It's Not Optical' mission (Rocket Lab)*



<sup>8</sup> <https://www.law.cornell.edu/uscode/text/10/2273>



space launch vehicles (or families of space launch vehicles).” Rather, this definition must evolve to accommodate emerging innovations like responsive launch, disaggregated space access using reusable launch, and in-space on-orbit transportation systems. Moreover, “assured access” must mean not only increased availability of launch options but also the ability to operate on and from orbit when immediate access from ground-to-orbit is potentially denied. The Space Force must look at the totality of space access options to include dedicated small launch, multi-manifesting, rideshare, and in-space transportation capabilities. More options mean more capability and better responsiveness. Phase Three of the National Security Space Launch Program represents an opportunity to fundamentally redefine assured access and space launch. Artificially locking in capabilities that are tied to two launch vehicle platforms and a stringent set of requirements will miss broader commercial space innovation and capabilities to keep pace with rapidly emerging threats.

## A Complete Space Ecosystem

### **4. The national security space enterprise must treat space as a complete ecosystem**

The national security space enterprise must treat space as an ecosystem, and more than just the sum of its parts. While much attention is rightfully focused on launch, it is only one part of the national security space enterprise. Greater consideration is needed not only of how things are put into orbit, but also what is put into orbit, and how it integrates with the broader space enterprise. Most important is the consideration of what capabilities are ultimately desired. It is insufficient to focus on requirements alone.

#### *Close the “Kill Chain” in Space & Define the Needed Effects in and From Space*

A capabilities-based or effects-based model of acquisition is now necessary to move the space enterprise forward, with investment in next-generation systems and technologies the priority. This necessitates a change in how space assets are bought, and what assets are bought. The enterprise must work with commercial and industrial partners to integrate new and emerging capabilities, leverage innovation, and respond to the dynamic technological environment.

The enterprise must look at the totality of the ecosystem of space, not just the platforms. This necessitates a change in thinking from lone satellites or single streams of service to the entirety of the national security architecture and strategy. The service must ask and answer fundamental questions: how do we win the joint fight? What do we want to do in space? What does the

*A Starlink Satellite Deployer in Orbit (SpaceX)*



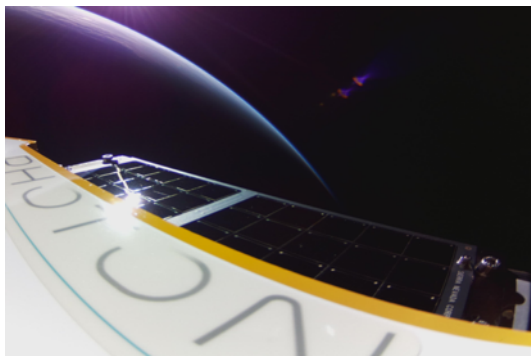
warfighter need? What is the best way to meet the operational and strategic goals? How does that capability integrate with the warfighter, and how best to visualize that capability with rapidly accessible and easy-to-comprehend data? We must think of closing the “kill chain” in space, treating space capabilities as a system and not just a collection of solitary platforms.

Achieving this broader “kill chain” in and from space requires an understanding that space capabilities are part of a system designed to prosecute the joint warfighting mission in all domains at all times. It is no longer about the individual soldier, sailor, Marine, airman, or guardian. It is about the totality of systems, sensors, and platforms that connect to that individual and their unit and enable them to operate at the highest possible level.

### *The Ecosystem & the Private Sector*

The modern and future “kill chains” will demand closer cooperation and more intimate relationships between the Government and commercial organizations and academia. The growth of commercial space is outpacing the ability of the armed services to separately plan or develop requirements. A close partnership with the commercial industry is thus critical to success. To succeed, the Space Force must change the way it does business with these entities, looking to match their speed of innovation with the Space Force’s speed of integration and adoption.

As evidenced by the commercial space revolution, new and emerging capabilities are deployed daily, including small satellites, reusable platforms for long-term utilization, mega-constellations, in-space manufacturing and assembly, dedicated small launch, rideshare missions, and reusable rockets. These and other emerging capabilities are revolutionizing the way the United States accesses space, and what can be done on-orbit. The Space Force must seize upon this revolution. Failure to do so will cede the advantage to America’s adversaries, who are aggressively accelerating the deployment of their own space and counter-space capabilities.



*Rocket Lab's Photon in Orbit (Rocket Lab)*

The Space Force must define the joint warfighter capabilities and desired effects to be delivered by space-based assets and then allow the market to build those in a competitive, smart, and risk-tolerant environment. The Space Force approach to requirements should shift from low-level *system* specifications to high-level *capability* requirements—in essence, define the ends desired, not the way it should be achieved, thereby allowing the companies to innovate.

This approach requires a fundamental paradigm shift whereby the art of what is possible is driven not by the military or government development, but by the commercial sector. It is no longer sufficient to merely tweak the margins of existing programs or continue planning for ten-year acquisition program cycles and block buys. Of course, there are some capabilities for which there is not yet a commercial business case, including strategic early warning and protected military communications. However, commercial capabilities, even in these areas, are rapidly evolving, offering new and novel opportunities for

intelligence exploitation and development. In the meantime, artificially constraining spacecraft development and deployment to a relatively static set of launch vehicle standards is inefficient and dissuades true innovation. By seizing upon the diversity of potential solutions to today's and tomorrow's national security challenge, the space enterprise will achieve greater resiliency and mission capability.

Critically, the U.S. space enterprise must build for the future by exploring new possibilities and operational concepts, including repurposing upper stages, on-orbit storage of replenishment assets, using stages as orbital refueling stations, satellite servicing, and other next-generation capabilities. Adversaries and near-peer competitors are already working in this field, successfully developing such on-orbit capabilities is critical to maintaining America's competitive edge. Doing so will demand a level of experimentation and innovation that is not yet present within the service or the Department of Defense as a whole. The national security space enterprise must be willing to try and fail and experiment and innovate, all while learning from those failures and continuing to deliver core national mission sets.



## Establishing Rules & Norms

### **5. Take necessary steps to establish a United States-led multilateral rules-based order for orbit and other planetary bodies including the Moon**

The White House should take the lead in developing rules of the road for what constitutes appropriate behavior for orbit and other planetary bodies. Part of this effort must be the establishment of norms of behavior where legal or institutional restrictions are insufficient or unable to be implemented. Perhaps most importantly, the White House needs to clarify red-lines and consequences for crossing those boundaries. This requires more communication about capabilities and intent.

This responsibility does not fall on the Space Force or U.S. Space Command alone, but their posture, capability, and orientation make both prime movers in establishing space norms. The incoming administration must therefore work with U.S. allies and partners, and within international institutions, to define a mutually acceptable space order. Space should be a global commons with rules and norms based on liberal, democratic values. Failing to follow this path cedes the initiative to China, or otherwise allows for outright anarchy on-orbit, neither of which serves U.S., allied, or global interests.

Achieving this end-state requires engagement with international institutions and allies and the establishment of mutually accepted standards for operation in Earth orbit and beyond. While this is unlikely to be an easy or smooth process, establishing the mechanisms for dialogue will greatly advance the effort to resolve unanticipated challenges and disputes. Domestically, the new administration can drive a much-needed whole-of-government approach. The Space Force and



*NASA Astronaut Christina Koch with a cookie baked in the Nanoracks ISS Oven (Nanoracks)*

U.S. Space Command must work with the Department of State and the Department of Commerce to define norms of behavior and rules of the road, including next-generation methods of debris mitigation and removal, such as in-space recycling or debris repurposing. They must also work with the Department of Transportation to improve launch approval and the Department of Commerce to address space traffic management. These organizations must also work with NASA and others on a unified approach to space that leverages the capabilities and meets the needs of commercial, civil, scientific, and national security space.

Internationally, the United States must work with allies in Europe and Asia to define rules of behavior and norms of operation for near-earth orbit, cis-lunar space, and beyond. This also requires an aggressive re-engagement with multilateral and international governmental organizations.

## LETTER FROM THE CO-CHAIRS

Since the launch of CSPC's first National Security Space Program report, we've seen the establishment of the Space Force, the election of a new administration, and countless changes in the commercial space sector. Reusable rockets are now the norm, so much so that it is considered news when a booster isn't recovered. American astronauts flew on an American rocket from American soil to the International Space Station. Mega-constellations offering high-speed broadband are becoming a reality, incredible investment is being made into the commercial sector, and the opportunities in the near-earth orbit and beyond are growing at an amazing rate.

Over two years since we published "Securing the Highest Ground" we've worked to educate members of Congress, the White House, the Pentagon, and the entirety of the national security space enterprise about the need for greater cooperation between the government and the private sector. We think we've managed to have a demonstrable effect in driving the narrative forward, shaping the discussion, and raising the awareness of the need for a more intimate relationship and partnership between the burgeoning commercial space sector and the government.

In each of the dozen events we held and countless off-the-record conversations, the opportunities for more fruitful cooperation were readily apparent—better and more diverse capabilities at cheaper prices, more responsive launch, and even on-orbit capabilities, disaggregated constellations, and novel technologies at the speed of innovation. The only real obstacles were institutional and policy in nature, all of which can be overcome with sufficient initiative and energy. Given the threats that we face from Russia and China on-orbit, and in particular the latter's keen interest to define a new international order, we cannot afford to miss the opportunities for closer cooperation to ensure our national and economic security.

Last December the Space Force turned one—the first birthday of America's newest service. In that year, it managed to accomplish a lot in terms of defining its culture, shaping its vision, and communicating it to the public. It is our hope that the excitement around the Space Force and the critical momentum and inertia are not lost now that the service is established and the political fight that preceded its creation is put to rest.

Leveraging the incredible expertise of the assembled participants of the National Security Space Program, we are pleased to submit our second set of recommendations to the new administration and new Congress. We believe that national security should be a non-partisan issue and approached this program and this report as such. We feel that if the actions included in this report are adopted we will see significant, critical, and lasting change in the national security space enterprise. We cannot afford to continue business as usual. The race for leadership in space is very much on, and if we are to define a Western-led, rules-based order on-orbit, and ensure our future national and economic security in and from space, we must act today.

**Mike Rogers**  
David M. Abshire Chair

**Glenn Nye**  
President & CEO

## Acknowledgments

On behalf of the Center for the Study of the Presidency & Congress, we want to thank the following for their contributions to CSPC's work on the National Security Space Program:

Blue Origin, Nanoracks, Rocket Lab, and other corporate partners, for their generosity in time, financial support, and knowledge, and interest in the subject. Without the support of these groups, addressing this forward-looking and increasingly important topic would not be possible.

From Blue Origin: Bretton Alexander, Scott Jacobs, and Megan Mitchell.

From Nanoracks: Jeffrey Manber, David Marsh, and Chris Cummins.

From Rocket Lab: Col Lars Hoffman (USAF, ret.).

The Secretary of the Air Force, the Honorable Barbara Barrett, and her exceptional staff, who provided invaluable perspectives and insights into Air Force space activities, active reforms, and long-term strategic planning.

Members of U.S. Strategic Command, whose thought leadership, knowledge, and expertise, helped shape and drive the National Security Space Program's objectives and outcomes and inform the program's discussions.

Members of the U.S. Space Force, whose input and counsel was invaluable to provide ground-truth, feedback, and insights as the service stood up in its first year.

The Trustees and Counselors of CSPC, for their advice, counsel, and support—for not only the Center's overall mission but also the encouragement to continue to take a strategic approach to the national security policy challenges of today and tomorrow.

Joshua Huminski, the Director of the Mike Rogers Center for Intelligence & Global Affairs, for his dedicated research, outreach to project participants, and program leadership. By building a strong network of policymakers and space innovators, he has continued to ensure that CSPC is a resource for leaders in this and other important national security fields.

Dan Mahaffee, the Senior Vice President and Director of Policy at CSPC, for his efforts in shaping the program and providing insightful perspectives on acquisition reform, and for cross-pollinating the National Security Space Program with other CSPC programs.

Our Senior Fellows and Advisors who contributed to this project—Andy Keiser, James Kitfield, and Michael Stecher—and applied their expertise from a range of fields to analyze the impact of these technologies and the challenges they pose for policymakers.

Our entire team at the Center that made this report possible: Chris Condon, Michelle Miller, Erica Ngoenha, Sara Spancake, and Tania Vasquez.

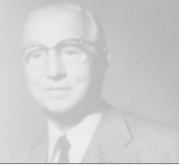
Brian Weeden and Victoria Samson at the Secure World Foundation for their support and for advancing the dialogue on counterspace capabilities and the importance of space sustainability.

Finally, we would like to thank all of those who dedicated time to our effort by attending roundtables (virtual or otherwise) and offering frank and invaluable advice.

## PROGRAM SUPPORTERS

DR. SCHOLL FOUNDATION

innovation. practicality. hard work. compassion.



**BLUE ORIGIN**

The logo for Blue Origin features a large, detailed black feather with a central rachis, positioned diagonally across the text.

**Nanoracks**

