

IMPROVING U.S. SPACE CAPABILITIES IN INTEGRATED DETERRENCE

Once dominated by U.S. government systems, space is ever more crowded, congested, and contested: It cannot be thought of as a sanctuary or safe haven.

Space-based systems underpin U.S. military and intelligence prowess, modern economic systems, and economic growth and vitality. Commercially developed capabilities continue to grow in absolute and relative importance, and an increasing number of nations and transnational organizations have access to these capabilities—not always with benign interests. This paper focuses on actions the new presidential administration can take in the first 100 days to leverage space in integrated deterrence.

Capabilities based in space, or reliant on space, play a critical role in maintaining U.S. and allied national security. While potential peer adversaries such as China and Russia also use space in similar ways, their reliance on those space systems for national security objectives may be less than ours. This places constraints on our ability to deter threats to our space systems purely by threatening adversary space systems. Instead, deterring conflict in space may require a blending of diplomatic, informational, military, and economic tools along with increased resilience for U.S. space capabilities.

The Case for Action

In February 2024, the U.S. government announced Russia's development of a nuclear weapon aimed at disabling satellites, underscoring the difference in our reliance on space systems. Such a weapon would theoretically damage a wide range of systems in space, with little or no ability to differentiate between a satellite's country of origin or intended use.

The asymmetric use of space by the United States and potential peer adversaries is often underappreciated. While Russia and China view their own space programs as signals of their great power status, they nevertheless are willing to threaten U.S. and Western operations in the realm, even if doing so might put their own systems at risk. Russia's willingness to develop and potentially use such a system highlights Moscow's perception of space systems as a greater vulnerability for the United States.

Space is “not a benign environment. It’s not just about keeping communications or satellites up. This is warfighting. The dependence upon space for all of the things we’re doing ... is ramping up.”

Gen. David Allvin,
Air Force Chief of Staff

MITRE's mission-driven teams are dedicated to solving problems for a safer world. Through our public-private partnerships and federally funded R&D centers, we work across government and in partnership with industry to tackle challenges to the safety, stability, and well-being of our nation.

Space capabilities provide the United States and our allies unprecedented advantages for national decision making, military operations, and homeland security. Space systems are vital to monitoring strategic and military developments and supporting treaty compliance and arms control verification. They are critical to our ability to monitor weather, respond to natural and man-made disasters, and monitor long-term environmental trends. The U.S. and allied military and intelligence sectors rely on national security, civil, and commercial space systems for Intelligence, Surveillance, and Reconnaissance; communication; command-and-control; missile warning-tracking-and-defense; tactical data links; terrestrial and space weather forecasting and warnings; and positioning, navigation, and timing.

U.S. use of space systems for national security and other purposes has not peaked and continues to grow in importance. These capabilities allow U.S. leaders to see with clarity, communicate with certainty, and navigate with accuracy. While the U.S. government (USG) has worked to protect these capabilities over the past decade, the threat to them is growing in significant ways, as reported by both the Defense Intelligence Agency and the National Space Intelligence Center.

There are additional challenges to using traditional deterrence methods in space. One is that, in wartime, if U.S. commanders found it necessary to attack adversary space systems through kinetic means, this could result in large debris fields, potentially devastating for all space-faring nations. As the leader in space capabilities, the United States could lose the most in such an exchange.

Key Challenges and Opportunities

Deterrence theory has so far prevented great power military conflict from spreading to space, but the trends are not positive. Russia, China, and India have successfully demonstrated anti-satellite capabilities, which are dangerous both for the ability to directly destroy U.S. satellites and because they can create large, unpredictable debris fields that could disrupt everything from everyday mobile phone usage to air traffic control.

Low Earth Orbit space systems vulnerable to kinetic and electromagnetic pulse threats are crucial for global commerce and economic activity, public safety, and national security. The U.S. government is increasingly leveraging rapidly expanding commercial space capabilities to meet civil and military needs. SpaceX's Falcon 9 rocket is significantly reducing the cost of launch and offering multiple launches per week. The global commercial satellite industry is growing exponentially, with the advent of proliferated Low Earth Orbit (pLEO) constellations, enabled by ever smaller and cheaper electronics. Relatively inexpensive pLEO satellites can reduce operational risk and increase resilience compared to traditional satellite deployment.

These pLEO constellations provide Earth imaging, internet access, and communications options. For national security purposes, the Intelligence Community has been an early adopter of pLEO offerings, working with commercial providers to add imagery resilience and expand intelligence capabilities.

U.S. space systems also need improved command-and-control capabilities to both enable and participate in broader all-domain operations. Traditional satellite communications have been performed by large satellites in geostationary orbit, but pLEO constellations offer a much-needed alternative approach. pLEO satellites can utilize a wide range of capabilities to offer the resilience needed for effective communications in all-domain operations.

An integrated approach to deterrence is required to deter potential peer adversaries from acting against U.S. space capabilities. A hypothetical war in the Baltics or over Taiwan, for example, would involve U.S. forces fighting far from our homeland but close to Russia or China, making space capabilities vital to a U.S. war effort. The United States needs a collective and sustained effort combining multiple approaches to deterrence to address these growing threats in space.

Recommendations

To provide integrated deterrence to deter adversary attacks on U.S. space systems, in their first 100 days administration officials should:

- 1** Determine and articulate how the United States would view a variety of types of attacks on our space systems, including:
 - Differences if any between how the USG would view reversible, non-kinetic, and kinetic attacks on U.S. space systems
 - Differences if any between how the USG would view attacks on:
 - USG systems supporting the nuclear deterrent
 - Other USG space systems
 - Commercial U.S. space systems used for national security purposes
 - Commercial U.S. space systems not used for national security
 - Partner-nation space systems
 - Clarify the role of space in war with the Departments of Defense and State and key allies. Refine how we deal with “short of war” provocations in operations plans and develop and tailor signaling options, including responses to both ambiguous and “red line” actions.
 - Make clear the United States will reply to space attacks in a timeline and manner of its choosing, not necessarily by action against other space systems.
- 2** Begin immediate planning for 2026 budget adjustments to build resilience into U.S. use of space systems for national security purposes. Actions include:
 - Expanding U.S. use of commercial systems for relevant national security purposes
 - Increasing USG development and use of pLEO and higher orbit systems
 - Building better interoperability and cross-system operability into U.S. uses of space-based capabilities, in particular for communications
- 3** Increase adversary perceptions of U.S. defensive capability in space, through actual improvements or through messaging about such improvements. Make clear the benefits all nations receive from space systems that work as planned, the ineffectiveness of attacking U.S. systems because of established workarounds and defenses, and the possible consequences of enemy action.

Implementation Considerations

The military organizations primarily responsible for space—U.S. Space Command and the U.S. Space Force (USSF)—are both relatively new, established in 2019. USSF organizes units, trains and equips them, and is now consciously reoptimizing for great power competition. For example, it plans to implement readiness standards requiring continuity of operations in contested conditions (rather than a benign environment). A fresh look at threats and adversary actions presents an opportunity to elevate integrated deterrence options in the USSF planning process.

Importantly, however, U.S. Space Command and the Space Force cannot on their own provide the needed deterrence to prevent adversary attacks on U.S. space systems. Deterring conflict in space requires a whole-of-government, even a whole-of-nation, approach to this important problem.

About the Center for Data-Driven Policy

The Center for Data-Driven Policy, bolstered by the extensive expertise of MITRE’s approximately 10,000 employees, provides impartial, evidence-based, and nonpartisan insights to inform government policy decisions. MITRE, which operates several federally funded research and development centers, is prohibited from lobbying. Furthermore, we do not develop products, have no owners or shareholders, and do not compete with industry. This unique position, combined with MITRE’s unwavering commitment to scientific integrity and to work in the public interest, empowers the Center to conduct thorough policy analyses free from political or commercial pressures that could influence our decision-making process, technical findings, or policy recommendations. This ensures our approach and recommendations remain genuinely objective and data-driven.

Connect with us at policy@mitre.org