



DOD Acquisitions for Space Depend on Prioritizing Warfighter Needs to Maintain Strategic Advantage

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**Presentation to the Naval Postgraduate School's Annual
Acquisition Research Symposium
May 10, 2023**

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Today's Presentation

- Objectives
- Background on Space Situational Awareness (SSA) systems and software
- Findings
- Recommendations

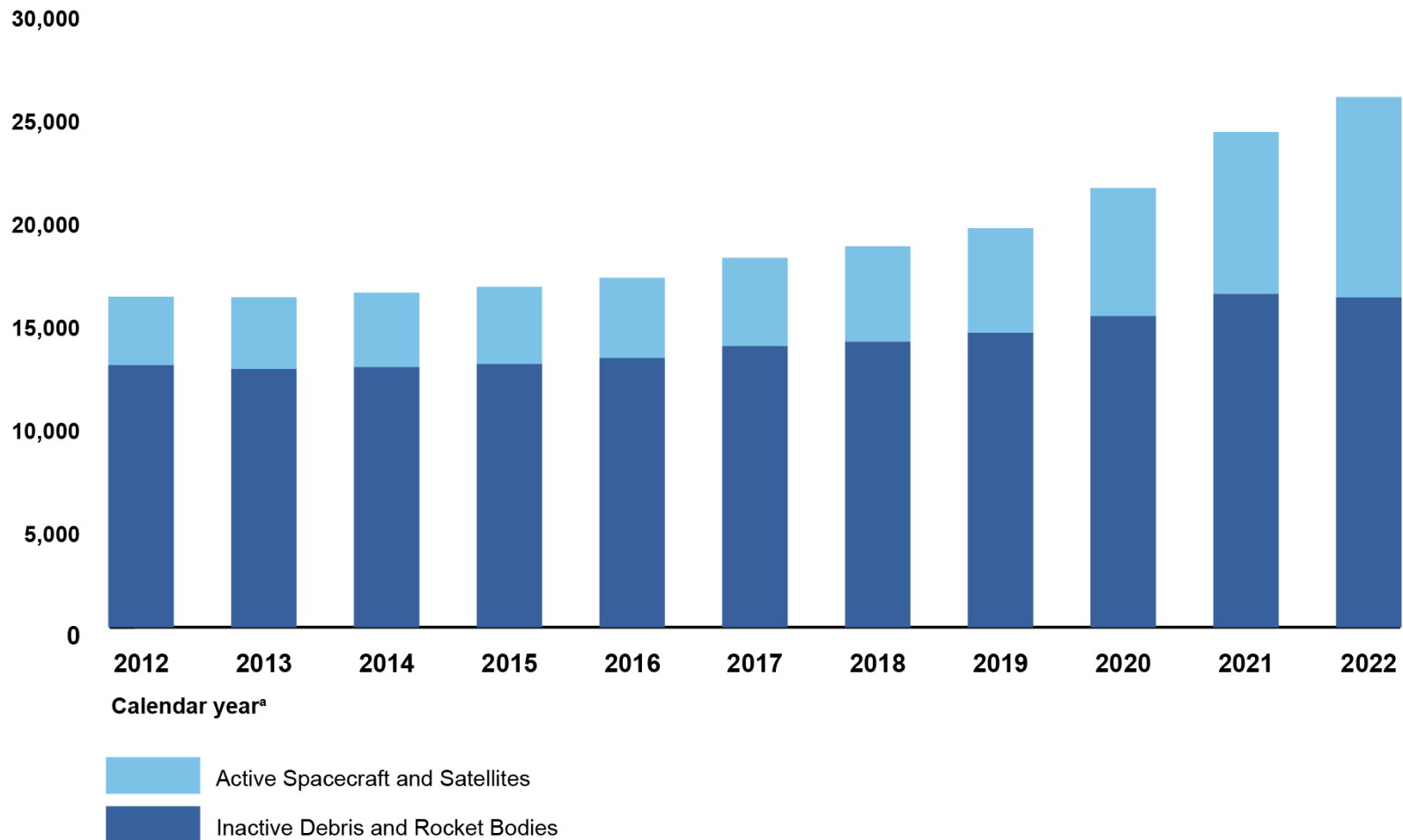


Objectives

1. What challenges does DOD face in identifying and characterizing objects in space?
2. To what extent does DOD use commercial SSA data?
3. What are the Air Force's plans to develop command and control capabilities for space and what challenges does it face?
4. What challenges does DOD face related to software reform efforts?

SSA, Space C2, and Software Challenges

Figure: Objects in the Space Force Satellite Catalog, Calendar Years 2012-2022



Background on SSA Systems and Software

- Space is vital to our nation's security, prosperity, and scientific achievement, and it is contested, congested.
 - DOD has developed, and is developing, systems to provide SSA and relied upon these systems for decades, including a network of ground- and space-based sensors, such as Space Fence and the Space Command and Control (C2) program.
 - DOD has made effort to modernize its software acquisition and development approaches but it continues to face challenges in executing them and rapidly delivering software to the warfighter.
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Key Findings for the warfighter

- Space Force has not fully evaluated how commercial SSA data could meet mission needs; acquisition has been limited.
 - Though DOD is acquiring some commercial SSA data, it is not integrated into operational systems and it is not available for use by the warfighter in daily operations.
- Space C2 faces challenges in multiple areas and plans are underway to address some but not all, despite taking new approach to software development.

Key Findings for the warfighter, cont.

- Programs using aspects of the Software Acquisition Pathway found that identifying outcome-based metrics and incorporating user perspective has been challenging.
 - For example, the Space C2 program’s metrics do not describe intended operational outcomes or capability delivered.

Table 3: Space Command and Control Program Metrics for Assessing Program Performance

Metric	Description
Deployment frequency	Deployment frequency measures how often product teams deploy software to production. This can be a direct or indirect measure of response time, team cohesiveness, developer capabilities, development tool effectiveness, and team efficiency.
Lead time	Lead time measures the time required to go from developing new code to successfully running the code in a production environment. Lead time is a measure of the efficiency of the development process and may indicate the process contains inefficiencies.
Mean time to restore	Mean time to restore measures the time from a failure to recovery from that failure.
Change fail rate	Change fail rate measures how often deployments fail.
Return on investment	Return on investment measures the value or benefit an effort provided and can include program efficiencies or direct benefits to users, such as reduction in time or cost to complete tasks.

Source: GAO assessment of the Space Command and Control Program draft acquisition strategy. | GAO-22-104685

Recommendations

- The Secretary of the Air Force should ensure that the Space Force establishes a process to regularly identify and evaluate commercial SSA capabilities, including the extent to which commercial SSA data could meet Space Force SSA needs (2023).
- The Under Secretary of Defense for Acquisition and Sustainment should ensure that the Space C2 program conduct periodic independent reviews to assess the program's approach to developing software and provide advice to the program for improving its progress (2019).
- DOD should automate data collection efforts for the software acquisition pathway (2021).

GAO reports

- Space Situational Awareness: DOD Should Evaluate How It Can Use Commercial Data, [GAO-23-105565](#)
- Space Command and Control: Opportunities Exist to Enhance Annual Reporting, [GAO-22-104685](#)
- Space Command and Control: Comprehensive Planning and Oversight Could Help DOD Acquire Critical Capabilities and Address Challenges, [GAO-20-146](#)
- Defense Acquisitions: Cyber Command Needs to Develop Metrics to Assess Warfighting Capabilities, [GAO-22-104695](#)
- DOD Software Acquisition: Status of and Challenges Related to Reform Efforts, [GAO-21-105298](#)



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