



Highlights of [GAO-04-759](#), a report to congressional committees

## Why GAO Did This Study

Missing among the Department of Defense's (DOD) portfolio of systems is a capability to track stationary and moving enemy vehicles on land or at sea in any type of weather, day or night, from space. To meet this need, DOD and the intelligence community are collaborating on the ambitious Space-Based Radar (SBR) program. By leveraging the newest generation of radar technologies, the SBR concept promises to deliver high-quality data to a wide array of users. DOD intends to start product development in 2006 and to field SBR satellites as quickly as possible so that warfighters, the intelligence community, and national decision makers can gain a better understanding of what adversaries are doing in specific locations around the world. GAO reviewed the SBR program to assess DOD's progress in attaining the knowledge it needs by 2006 in terms of customer needs (or requirements) and resources.

## What GAO Recommends

Before committing to SBR's acquisition program in 2006, GAO recommends that DOD and intelligence partners close gaps in the requirements approval process in terms of documenting decisions and be prepared to add time and money or make trade-offs with other DOD space programs to address SBR's requirements and resources. DOD generally agreed with our findings and partially agreed with our recommendations.

[www.gao.gov/cgi-bin/getrpt?GAO-04-759](http://www.gao.gov/cgi-bin/getrpt?GAO-04-759).

To view the full product, including the scope and methodology, click on the link above. For more information, contact Katherine V. Schinas at (202) 512-4841 or [schinasik@gao.gov](mailto:schinasik@gao.gov).

## DEFENSE ACQUISITIONS

# Space-Based Radar Effort Needs Additional Knowledge before Starting Development

## What GAO Found

Although SBR is 2 years away from product development, the program already faces major challenges. DOD officials say SBR will likely be the most expensive and technically challenging space system ever built by DOD. The acquisition time frame is much shorter than what has been achieved in the past for other complex satellite systems. Finally, DOD is setting precedence by taking the lead on developing SBR with the intelligence community as a partner. Most DOD space programs that GAO has reviewed in the past several decades were hampered by schedule and cost growth and performance shortfalls. Problems were largely rooted in a failure to match requirements with resources when starting product development. Commitments were made without knowing whether technologies being pursued would work as intended. To avoid these problems, leading commercial firms have adopted a knowledge-based model that enables decision makers to be reasonably certain about their products at critical junctures and helps them make informed investment decisions.

Although DOD has taken positive steps to strengthen the involvement of senior leaders within DOD and the intelligence community in setting requirements, SBR's concept of operations has not been approved and signed by requirements boards for either of the two partners. Without documentation and formal approval, it is unclear who will be held accountable for setting requirements or how disagreements among SBR's partners will be resolved when DOD moves SBR into ensuing phases of acquisition.

DOD has adopted noteworthy practices to gain knowledge about SBR's resources. These include maximizing the use of systems engineering to close gaps between requirements and resources; estimating all of SBR's costs; exploring alternatives for SBR if the Transformational Communications Architecture (TCA)—the communications infrastructure that is expected to relay SBR data across a network of users—incur schedule and performance shortfalls; and asking contractors to propose multiple operations concepts for SBR with or without TCA. Despite these accomplishments, DOD is at risk of knowledge gaps. SBR's critical technologies will not be mature when product development starts, as called for by best practices. One of TCA's primary components may not be ready in time to support SBR data. These knowledge gaps make it harder for DOD to reliably estimate how much time and money are needed to complete SBR's development. If TCA is delayed, DOD's alternatives may involve reducing SBR's capabilities or significantly increasing program cost. Without sufficient knowledge, DOD may not be able to determine by the time SBR's product development starts in 2006 whether space-based radar is best suited to tracking moving targets on land or at sea or whether air-based radar would provide enough capabilities at far less cost. More specific analyses would help DOD weigh the merits of various alternatives and assess how much to invest in the SBR acquisition program versus air platforms with similar capabilities.