

GAO Highlights

Highlights of [GAO-13-729](#), a report to congressional committees

Why GAO Did This Study

The GPS—a space-based satellite system that provides positioning, navigation, and timing data to users worldwide—has become an essential U.S. national security asset and component in daily life. The GPS program is being modernized to enhance its performance, accuracy and integrity. In 2013, the House Armed Services Committee directed the Air Force to report on lower-cost GPS solutions. The committee also mandated that GAO review the Air Force report. GAO (1) assessed the extent to which the Air Force GPS report met Committee requirements; and, (2) identified additional information that is important in guiding future GPS investments. GAO reviewed the Air Force report, interviewed officials responsible for preparing it, and consulted subject matter experts from the positioning, navigation, and timing advisory community.

What GAO Recommends

GAO recommends the Air Force: (1) affirm the future size of the GPS constellation it plans to support; (2) ensure future assessments are comprehensive and include cost risk and the impact of options on all three GPS segments; and (3) engage the broader stakeholder community in future assessments of options. DOD concurred with these recommendations.

View [GAO-13-729](#). For more information, contact Marie A. Mak at (202) 512-2527 or makm@gao.gov.

September 2013

GLOBAL POSITIONING SYSTEM

A Comprehensive Assessment of Potential Options and Related Costs is Needed

What GAO Found

GAO found the Air Force, the military branch responsible for Global Positioning System (GPS) acquisition, in its report on *Lower Cost Solutions for Providing Global Positioning System Capability*, broadly addressed all four congressional requirements—system capability, implementation approaches, technical and programmatic risks, and estimated costs—for each option presented for the space segment. GPS consists of three segments—space, ground control, and user equipment—but the study only addressed the space segment, which accounts for the largest share of total GPS costs—more than half—in the Air Force’s current budget. The Air Force identified and assessed nine options for future GPS space segments, ranging in cost from \$13 billion to \$25 billion from fiscal year 2013 through 2030. The report assessed each option based on a constellation or collection of 30 total satellites instead of 24, which is the Air Force’s baseline GPS requirement for accuracy. This increase in total satellites raises an issue with the constellation size the Air Force intends to support in the future. Air Force officials stated that the cost analyses supporting the nine options were high-level cost estimates. Although this may be expected given the time constraints and other limitations of the study, these estimates are not at a level that would support future GPS investment decisions. Table 1 identifies GAO’s evaluation of the Air Force report relating to congressional requirements.

Table 1: Extent Air Force Report Met Congressional Requirements and GAO Observations

Requirement	Requirement met?	GAO observations
System capability	Yes, for the space segment	Each option is assessed on how long it would take the given option to achieve a constellation of 30 satellites; on signal integrity; and on its ability to accomplish its mission in the presence of adverse conditions or hostile actions (resilience).
Implementation approaches	Yes, for the space segment	Each option is assessed on its relative strengths and weaknesses, and potential courses of action are identified.
Technical and programmatic risks	Yes, for the space segment	The level (low, medium, high) of technical and programmatic risks associated with each option are identified.
Estimated costs of any recommended options	Yes, for the space segment	Relative rough cost estimates for each option are identified and comparisons across the options are indicated.

Source: GAO analysis of Air Force information.

Although the Air Force report is a good starting point, more information on key cost drivers and cost estimates, and broader input from stakeholders would help guide future investment decisions. Specifically, the key cost drivers include dual launch capability (launching two satellites on a single launch vehicle), navigation satellites (smaller GPS-type satellites yet to be developed), and a nuclear detection capability. The cost estimates also excluded the ground control and user equipment segments and cost risk. Further, the Air Force did not obtain inputs from some key stakeholders such as those from the GPS positioning, navigation, and timing advisory community. Consequently, without conducting a more comprehensive assessment that addresses each of these concerns, the Air Force is not yet in a position to make sound future GPS investments.