



Highlights of [GAO-09-618](#), a report to congressional addressees

## Why GAO Did This Study

After the planned retirement of the space shuttle in 2010, the National Aeronautics and Space Administration (NASA) will face a cargo resupply shortfall for the International Space Station of approximately 40 metric tons between 2010 and 2015. NASA budgeted \$500 million in seed money to commercial partners to develop new cargo transport capabilities through its Commercial Orbital Transportation Services (COTS) project. NASA used its other transaction authority to award agreements to commercial partners. These agreements are not federal government contracts, and are therefore generally not subject to federal laws and regulations that apply to federal government contracts.

GAO previously reported concerns about whether COTS vehicles would be developed in time to meet the shortfall. Subsequently, GAO was directed by the explanatory statement accompanying the Consolidated Appropriations Act, 2008, to examine NASA's management of the COTS project and its expenditures. In addition, GAO was asked to examine (1) NASA's reliance on commercial partners to meet the space station's cargo resupply needs; and (2) progress or challenges in developing commercial space transport capabilities.

GAO analyzed NASA reports, briefings, and other information and held interviews with NASA and commercial partner officials. NASA concurred with GAO's findings.

[View GAO-09-618](#) or [key components](#). For more information, contact Cristina Chaplain at (202) 512-4841 or [chaplainc@gao.gov](mailto:chaplainc@gao.gov).

## NASA

### Commercial Partners Are Making Progress, but Face Aggressive Schedules to Demonstrate Critical Space Station Cargo Transport Capabilities

#### What GAO Found

During the course of our review, we found NASA's management of the COTS project has generally adhered to critical project management tools and activities and the vast majority of project expenditures were for milestone payments to COTS partners. NASA has established fixed-price, performance-based milestones in its agreements with commercial partners and partners are only paid once the milestone has been successfully completed. NASA has also taken several steps since the beginning of the COTS project to ensure that risks were identified, assessed, and documented, and that mitigation plans were in place to reduce these risks. NASA has communicated regularly with its partners through quarterly and milestone reviews and provided them with technical expertise to assist in their development efforts and to facilitate integration with the space station. As of the end of fiscal year 2008, NASA has spent \$290.1 million, with 95 percent of project funding spent on milestone payments to COTS partners.

The vehicles being developed by commercial partners Space Exploration Technologies Corporation (SpaceX) and Orbital Sciences Corporation (Orbital) through the COTS project have become essential to NASA's ability to fully utilize the space station after its assembly is completed and the space shuttle is retired in 2010. NASA estimates that it will need a total of 82.7 metric tons of dry cargo delivered to the space station between 2010 and 2015 to meet crew needs and to support maintenance and scientific experiments. Commercial partners' vehicles will transport almost half of this cargo and are scheduled to fly more cargo delivery missions than the space shuttle and international partners' vehicles combined—including 14 of the last 19 missions. Delays in the availability of commercial partners' vehicles to fill the cargo resupply gap would result in diminished usage of the space station.

While SpaceX and Orbital have completed most of the development milestones required thus far on time, both companies are working under aggressive schedules and have recently experienced schedule slips that have delayed upcoming demonstration launch dates by several months. SpaceX successfully completed its first 14 development milestones on time and is in the process of testing, fabricating, and assembling key components. However, a schedule slip in the development of its launch vehicle has contributed to anticipated delays of 2 to 4 months in most of its remaining milestones, including upcoming demonstration missions. Its first demonstration mission has been delayed from June 2009 to no earlier than September 2009, and its third demonstration mission has been delayed from March 2010 to no earlier than May 2010. NASA is currently evaluating the effect of potential further delays. Orbital has successfully completed 7 of 19 development milestones thus far, but has experienced delays in the development of its launch vehicle. Orbital and NASA have recently amended their agreement to demonstrate a different cargo transport capability than had been originally planned, delaying its demonstration mission date from December 2010 until March 2011.