

## Why GAO Did This Study

As the commercial space transportation industry has grown significantly in the last decade, a related industry has emerged that plans to complement the commercial space industry by using vehicles called space support vehicles to conduct space-related activities, but not launch into space.

The U.S. Commercial Space Launch Competitiveness Act of 2015 includes a provision for GAO to review the uses for space support vehicles and services and any barriers to their use. This report addresses stakeholder views on (1) potential uses for space support vehicles, (2) challenges that companies may face when attempting to use these vehicles, and (3) how these vehicles should be regulated. GAO reviewed prior GAO and industry reports, relevant laws and regulations, and interviewed officials on two proposals for regulating space support vehicles. GAO interviewed officials at FAA and the National Aeronautics and Space Administration and 37 legal experts and stakeholders from industry organizations, launch companies, space support companies, and spaceports—identified by agency and industry officials.

## What GAO Recommends

The Secretary of the Department of Transportation (DOT) should direct the FAA Administrator to fully examine and document whether the FAA's current regulatory framework is appropriate for space support vehicles and, if not, suggest legislative or regulatory changes, or both, as applicable. DOT provided technical comments; however, it did not comment on the recommendation at this time.

View [GAO-17-100](#). For more information, contact Gerald L. Dillingham, Ph.D. at (202) 512-2834 or [dillinghamg@gao.gov](mailto:dillinghamg@gao.gov)

## COMMERCIAL SPACE

### FAA Should Examine How to Appropriately Regulate Space Support Vehicles

## What GAO Found

Company officials GAO interviewed identified potential uses for “space support vehicles”—which include a variety of aircraft from high-performance jets to balloons and the aircraft portion of a hybrid launch systems (a vehicle that contains elements of both an aircraft and a rocket-powered launch vehicle)—but the size of the market for these uses is unclear. Company officials said they plan to use space support vehicles to train spaceflight participants and to conduct research in reduced gravity environments. For example, some company officials said they would like to use high-performance jets to train future spaceflight participants by exposing them to physiological and psychological effects encountered in spaceflight. Other company officials said they would like to use space support vehicles to research how objects or people react in reduced gravity environments. It is difficult to know the size of the market for spaceflight training and research as GAO found no studies on these markets. However, stakeholders said they expect interest in research to increase.

Some company officials said the Federal Aviation Administration's (FAA) regulatory framework presents a market challenge because companies cannot get FAA approval to use the aircraft they would like to use to carry passengers or cargo for compensation, thus limiting their ability to operate in the market. FAA's Office of Aviation Safety (AVS) regulates aircraft that companies would like to use as space support vehicles by issuing standard and experimental certificates that help ensure safety. While officials from two companies GAO interviewed have received standard aircraft certification for their space support vehicle, others said the standard certification process is lengthy and not designed for the type of vehicles they would like to use, such as unique, single-production aircraft or retired military jets. In addition, FAA regulations do not allow companies to receive compensation for carrying people or property on an aircraft operating under an experimental certificate. As a result, some of the companies we interviewed have training operations in other countries where they can receive payment for the activity. Further, FAA's Office of Commercial Space Transportation (AST)—the office that regulates commercial space activities—is only authorized to regulate commercial space activities, such as launches, focusing on the safety of third parties. According to FAA officials, a statutory or regulatory change would be needed to allow companies to use space support vehicles that do not meet AVS's standard certification requirements for compensation.

Stakeholders GAO interviewed have mixed views on how FAA should regulate space support vehicles; some companies believe the current regulatory approach is appropriate, while others believe the system should be changed in the face of new technology and commercial space development. While FAA has taken steps to assess the licensing and permitting process for hybrid launch vehicles, it has not assessed whether space support vehicles are needed and if it should propose changes that would accommodate all aircraft that could be used as space support vehicles. Thus, some U.S. company officials said they are delaying investments in space support vehicles, and therefore, it is uncertain if they will be able to use them to meet the future needs of the commercial space transportation industry.