

## ▶▶▶ COMMERCIAL SPACE TRANSPORTATION

The Federal Aviation Administration's (FAA) Office of Commercial Space Transportation (AST) licenses and regulates U.S. commercial space launch activity including launch vehicles and non-federal launch sites authorized by Executive Order 12465 and 49 US Code, Subtitle IX, Chapter 701 (formerly the Commercial Space Launch Act). Title 49 and the Executive Order also direct the Department of Transportation (carried out by the FAA) to encourage, facilitate, and promote commercial launches. AST's mission is to license and regulate commercial launch and reentry operations and non-federal launch sites to protect public health and safety, the safety of property, and the national security and foreign policy interests of the United States.

### OVERVIEW

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Commercial space transportation primarily consists of commercial launch service providers launching satellites into orbit for either commercial or government customers. Commercial space transportation also includes suborbital launches, where a payload or a vehicle is launched on a trajectory that briefly enters space but returns to Earth without entering orbit. Finally, it includes the reentry of objects from space to Earth.

The FAA licenses several expendable vehicles used for commercial orbital launches. The most frequently used vehicles are:

- Atlas V, an intermediate- to heavy-class vehicle (depending on variant) built by United Launch Alliance (ULA), a joint venture between Boeing and Lockheed Martin, and marketed by Lockheed Martin Commercial Launch Services;
- Delta II, a medium-class vehicle, and the Delta IV, an intermediate- to heavy-class vehicle (depending on variant), both built by ULA and marketed by Boeing Launch Services (BLS);
- Falcon 1, a small launch vehicle, and the Falcon 9, an intermediate- to heavy-class vehicle (depending on variant), built and operated by Space Exploration Technologies Corporation (SpaceX);
- Pegasus and Taurus, two small-class vehicles built and operated by Orbital Sciences Corporation (Orbital); and,
- Zenit-3SL, a heavy-class vehicle built by the Ukrainian company KB Yuzhnoye for the multinational Sea Launch AG venture, which conducts launches from a floating launch platform, with Long Beach, CA as its home port.

The Falcon 9 vehicle by SpaceX accomplished a successful inaugural flight on June 4, 2010, and its first Commercial Orbital Transportation System (COTS) Dragon demonstration mission on December 8, 2010.

The medium-class Taurus II by Orbital is currently under development, its first launch planned for 2011.

From 1989 through the end of 2010, DOT/FAA has licensed 204 orbital and suborbital commercial launches.

FAA first granted Experimental Permits, for suborbital reusable vehicle development and test flights, in 2006 to Blue Origin and Armadillo Aerospace. Other permits have been granted for vehicles participating

in the Lunar Lander Challenge. This is a competition to demonstrate technologies potentially applicable to both future lunar spacecraft and commercial suborbital vehicles, with \$2 million in prizes offered by NASA’s Centennial Challenges program.

Eight commercial spaceports, located in six states, Alaska, California (Vandenberg Air Force Base and Mojave Air and Space Port), Florida (Cape Canaveral and Cecil Field Spaceport), New Mexico, Oklahoma, and Virginia, currently have FAA launch site operator licenses. Several other commercial spaceports around the United States are under development.

## REVIEW OF 2010

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There were four FAA-licensed launches, all orbital, in 2010, down from five in 2009. BLS performed two launches, one Delta IV launch of meteorological GOES P satellite for NOAA and a Delta II launch of the Cosmo-Skymed 4 Earth observation satellite for the Government of Italy. SpaceX successfully performed the inaugural launch of Falcon 9 carrying Dragon demo payload in June and the first in a series of NASA COTS Dragon capsule demonstration launches in December.

FAA Licensed and Permitted Launches, 2009-2011			
	2009	2010	2011 Forecast
Licensed Launches	5	4	5-8
Permitted Launches	0	0	5-10

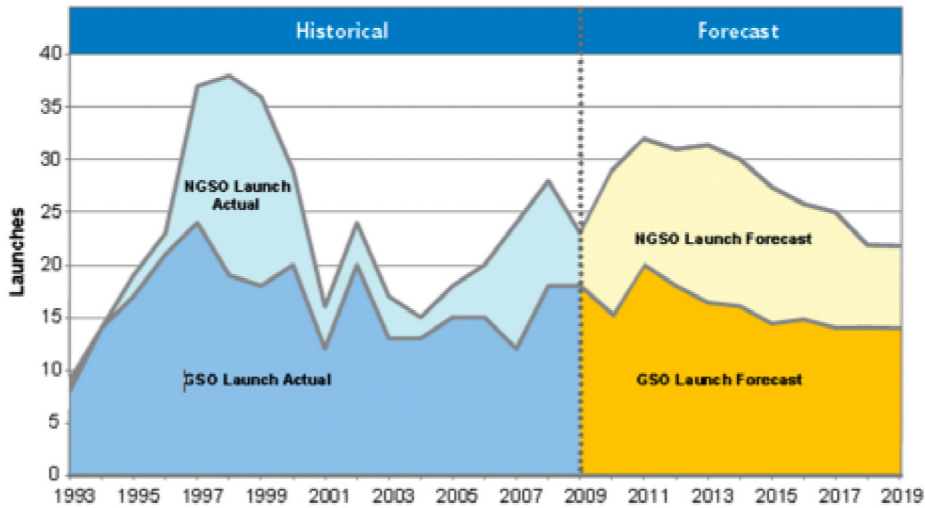
Worldwide there were 23 orbital commercial launches in 2010, compared to 24 in 2009. In addition to the four FAA-licensed launches, Europe performed six commercial launches of its Ariane 5, and Russia conducted thirteen commercial launches of various vehicles. There were 74 total worldwide commercial, civil, and military launches in 2010, with commercial launches representing approximately 31 percent of the total. For more details, see the Year in Review report available online at:

[http://www.faa.gov/about/office\\_org/headquarters\\_offices/ast/reports\\_studies/year\\_review/](http://www.faa.gov/about/office_org/headquarters_offices/ast/reports_studies/year_review/).

## GLOBAL FORECAST

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In May 2010, the FAA and the Commercial Space Transportation Advisory Committee (COMSTAC) published their annual global forecast for commercial launch demand, the *2010 Commercial Space Transportation Forecasts*. The report forecasts an average of 27.6 commercial orbital launches per year of geosynchronous orbit (GSO) and non-geosynchronous orbit (NGSO) payloads through 2019. That annual average includes 15.7 launches of medium-to-heavy vehicles to deploy GSO satellites, 9.1 launches of medium-to-heavy vehicles to NGSO, and 2.8 launches to NGSO by small vehicles.



Commercial GSO launches are used for communications satellites with masses ranging from 2,000 to over 6,000 kilograms. There has been an increase in the number of GSO satellites that are larger and more complex; however, there is still a demand for smaller satellites. Demand for commercial NGSO launches spans a number of markets, including commercial remote sensing; science and technology demonstration; and replenishment and replacement of low Earth orbit communications satellite systems reaching the end of their lifespan. The majority of commercial NGSO launches for science and technology demonstration missions are for nations that do not have indigenous launch capability.

The GSO and NGSO forecasts are not a prediction of what will actually be launched but instead represent the expected demand for launch services, based on a variety of inputs. The complete forecast report is available at:

[http://www.faa.gov/about/office\\_org/headquarters\\_offices/ast/reports\\_studies/forecasts/](http://www.faa.gov/about/office_org/headquarters_offices/ast/reports_studies/forecasts/).