



## Launch Services Program:

Established in 1998, the Launch Services Program brings together technology, business, procurement, engineering best-practices, strategic planning, studies, and techniques – all instrumental components for the United States to have a dependable and secure Earth-to-space bridge dedicated to launching all types of spacecraft. Capitalizing on a half-century of expertise, LSP strives to facilitate and reinvigorate America's space program by broadening the unmanned rocket and satellite market while providing reliable, competitive and user-friendly launch services.

### 1) Tracking and Data Relay Satellite (TDRS):

The TDRS Project consists of communications satellites that are part of a follow-on spacecraft fleet that will replenish NASA's Space Network. The January 30, 2013 launch of TDRS-K began the replenishment of the fleet through the development and deployment of the next generation spacecraft. Replenishment continued with TDRS-L, launched January 23, 2014 and will finalize with the launch of TDRS-M in the near future. These satellites will ensure the Space Network's continuation of around-the-clock, high throughput communications services to NASA's missions; serving the scientific community and human spaceflight program for many years to come.

### 2) Pegasus XL:

Orbital ATK produces the Pegasus XL, a small commercial vehicle launched from the company's L-1011 Stargazer aircraft. The Pegasus XL can carry a payload up to 450 kg to Low Earth Orbit. The Pegasus XL weighs approximately 23,130 kg (51,000 lbm), and measures 16.9 m (55.4 ft) in length and 1.27 m (50 in.) in diameter, and has a wing span of 6.7 m (22 ft).

### 3) Delta II:

United Launch Alliance produced the Delta II launch vehicle. A four-digit system is used to identify specific Delta II configurations. The last two Delta II launches will be for the Launch Service Program. They are Joint Polar Satellite System (JPSS) and the Ice, Cloud, and Land Elevation Satellite-2 (ICESat-2).

### 4) Atlas V:

The United Launch Alliance offers multiple Atlas V configurations available to carry a range of payloads from the 4 meter diameter fairing to the 5 meter diameter fairing. That is more volume than an average single family home! Solid rocket boosters are available to increase performance. The Atlas V can carry a payload up to 18,300 kg to Low Earth Orbit.

### 5) Falcon 9:

Space X offers the Falcon 9 which is a two-stage rocket designed to carry medium to large satellites weighing up to 28990 pounds (13,150 kg) into low-Earth orbit, and up to 11,700 pounds (5,300 kg) into geosynchronous orbit.

### 6) Delta IV:

The United Launch Alliance Delta IV can carry 9,285 pounds (4,211 kilograms) to 28,950 pounds (13,132 kilograms) to Geostationary transfer orbit (GTO) and 17,900 pounds (8,119 kilograms) to 50,800 pounds (23,043 kilograms) into low-Earth orbit, depending on vehicle configuration.

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