National Aeronautics and Space Administration

NASAfacts

NASA's Commercial Crew Program

Goal

NASA's Commercial Crew Program (CCP) was formed to facilitate the development of a U.S. commercial crew space transportation capability with the goal of achieving safe, reliable and cost-effective access to and from the International Space Station and low-Earth orbit.

Background

CCP has invested in multiple American companies that are designing and developing transportation capabilities to and from low-Earth orbit and the International Space Station. By supporting the development of human spaceflight capabilities, NASA is laying the foundation for future commercial transportation capabilities.

Ultimately, the goal is to establish safe, reliable and cost-effective access to space. Once a transportation capability is certified to meet NASA requirements, the agency will fly missions to meet its space station crew rotation and emergency return obligations.

Throughout the process, both NASA and industry have invested time, money and resources in the development of their systems. NASA also is spurring economic growth through this program as potential new space markets are created.

To accelerate the program's efforts and reduce the gap in American human spaceflight capabilities, NASA awarded more than $8.2 billion in Space Act Agreements (SAAs) and contracts under two Commercial Crew Development (CCDev) phases, the Commercial Crew Integrated Capability (CCiCap) initiative, Certification Products Contract (CPC) and Commercial Crew Transportation Capability (CCtCap).

CCP is primarily based at NASA's Kennedy Space Center in Florida, the space agency's premier launch site. About 200 people are working in CCP for NASA, with almost half involved in the work at other NASA centers, including Johnson Space Center in Houston and Marshall Space Flight Center in Huntsville, Alabama.

How NASA's Commercial Crew Program is Different

NASA's Prior Approach for Obtaining Crew Transportation Systems:

- NASA devised requirements for a crew transportation system that would carry astronauts into orbit, then the agency's engineers and specialists oversaw every development aspect of the spacecraft, its support systems and operations plans.
- An aerospace contractor was hired to build the crew transportation system to the design criteria and the standards NASA furnished.
- NASA personnel were deeply involved in the processing, testing, launching and operation of the crew transportation system to ensure safety and reliability. The space agency owned the spacecraft and its operating infrastructure.
- Every spacecraft built for humans, from Mercury to Gemini and Apollo to the space shuttle and American section of the International Space Station, was built and operated using this model.

Commercial Crew's Approach for Obtaining Crew Transportation Systems:

- NASA's engineers and aerospace specialists work closely with companies to develop crew transportation systems that can safely, reliably and cost-effectively carry humans to low-Earth orbit, including the International Space Station, and return safely to Earth.
- Interested companies are free to design the transportation system they think is best. For the contract phases of development and certification, each company must meet NASA's pre-determined set of requirements.
- The companies are encouraged to apply their most efficient and effective manufacturing and business operating techniques throughout the process.
- The companies own and operate their own spacecraft and infrastructure.
- The partnership approach allows NASA engineers insight into a company's development process while the agency's technical expertise and resources are accessible to a company.

Complementary Approaches to Complementary Goals

Space Act Agreements: When NASA decided to support the development of new U.S. human spaceflight capabilities to low-Earth orbit, it relied on its commercial partners to propose specifics, ranging from the design and capabilities to private investment ratio, milestone achievements, success criteria and timelines. Once an agreement was accepted, CCP and its expert teams worked closely with each company to provide technical support and determine when milestones were met.

Contracts: Concurrently with the Space Act Agreements, NASA established safety and mission requirements for missions to the International Space Station that would be flown under a NASA contract. During their development efforts, companies could choose to design their systems to meet NASA's pre-determined requirements. To support the certification of these systems, NASA awarded Certification Products Contract (CPC) and Commercial Crew Transportation Capability (CCtCap) contract*s*.

Commercial Development with Space Act Agreements

To support the goal of achieving safe, reliable and cost-effective access to and from low-Earth orbit for commercial customers, NASA used Space Act Agreements to partner with domestic companies capable of contributing to the development of a U.S. human spaceflight capability.

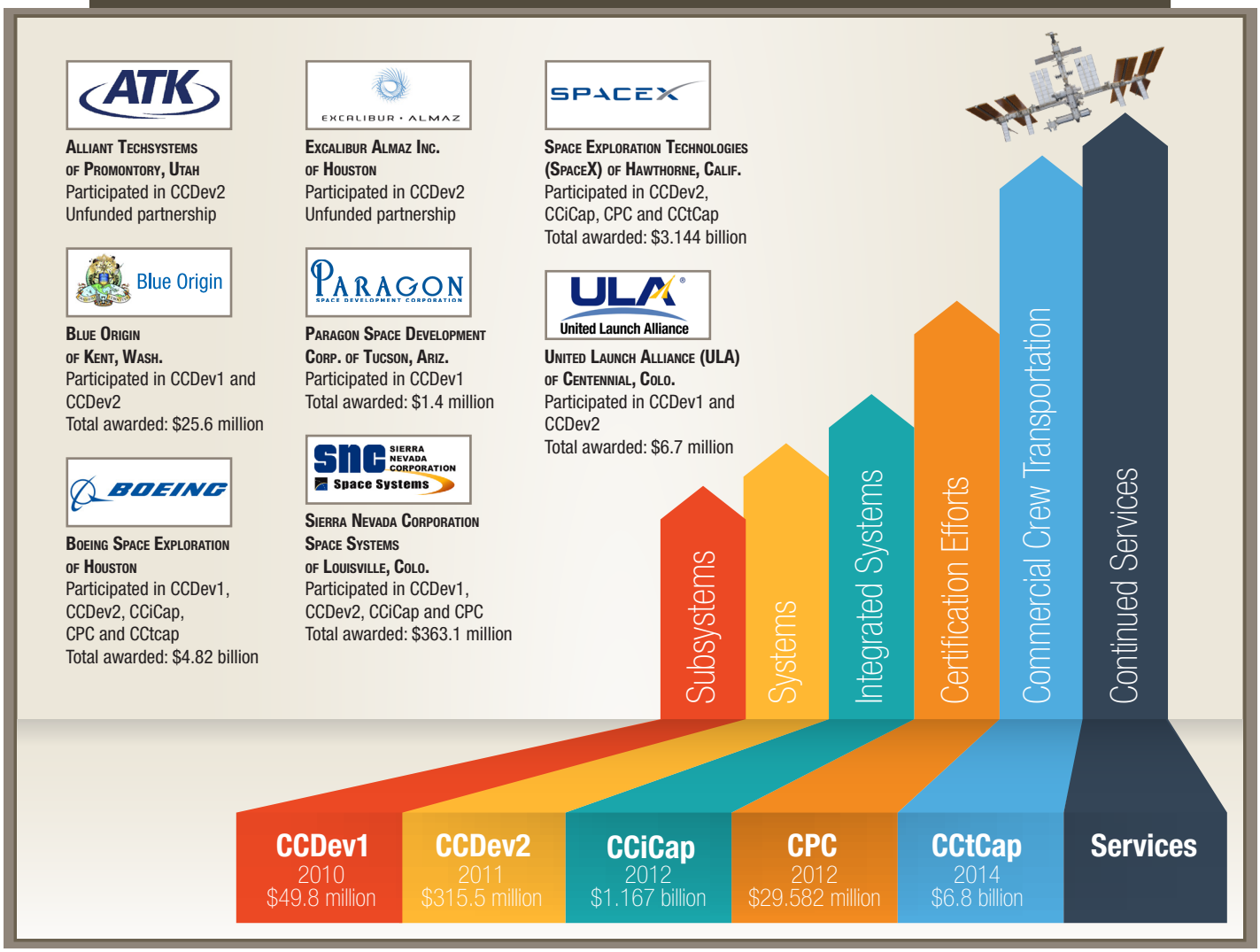
Commercial Crew Development Round 1 (CCDev1)
Space Act Agreement
As NASA retired the space shuttle, the ability of private industry to take on the task of providing routine access to space was of vital importance. In 2010, NASA invested a total of nearly $50 million of the American Recovery and Reinvestment Act (ARRA) funds for CCDev1 to stimulate efforts within the private sector to aid in the development and demonstration of safe, reliable and cost-effective crew transportation capabilities. It included the development and maturation systems and subsystems, such as a spacecraft, launch vehicle, launch abort systems, environmental control and life support system, launch vehicle emergency detection systems and more.

Blue Origin - $3.7 million
Boeing - $18 million
Paragon Space Development Corporation - $1.4 million
Sierra Nevada Corporation (SNC) - $20 million
United Launch Alliance (ULA) - $6.7 million

Commercial Crew Development Round 2 (CCDev2)
Space Act Agreement
CCDev2 kicked off in April 2011 when NASA awarded a total of nearly $270 million to four companies to aid in further development and demonstration of safe, reliable and cost-effective transportation capabilities. The agency also signed unfunded Space Act Agreements to establish a framework of collaboration with additional aerospace companies.

Who Is Involved?

These companies played roles in the development and certification phases of the Commercial Crew Program. Amounts are totals of all Space Act Agreements and contracts awarded to each company.



As part of those agreements, NASA reviewed and provided expert feedback on overall concepts and designs, systems requirements, launch vehicle compatibility, testing and integration plans, and operational and facilities plans.

Alliant Techsystems Inc. (ATK) - unfunded
Blue Origin - $22 million
Boeing - $92.3 million
Excalibur Almaz Inc. (EAI) - unfunded
Sierra Nevada Corporation (SNC) - $80 million
SpaceX - $75 million
United Launch Alliance (ULA) – unfunded

NASA later funded an additional $20.6 million to Boeing and $25.6 million to Sierra Nevada Corporation by exercising optional, pre-negotiated milestones, which were part of their original Space Act Agreements, to accelerate development.

In 2012, the agency extended its CCDev2 agreement with Blue Origin in an unfunded capacity. Through the agreement, the agency continued to support the development of the company's Space Vehicle and related systems.

Commercial Crew Integrated Capability (CCiCap)

Space Act Agreement

CCiCap continued the development of three fully integrated systems. The Space Act Agreements called for industry partners to develop crew transportation capabilities and to perform tests to verify, validate and mature integrated designs.

Boeing - $460 million
Sierra Nevada Corporation (SNC) - $212.5 million
SpaceX - $440 million

NASA later funded an additional $20 million to Boeing, $20 million to SpaceX and $15 million to Sierra Nevada Corporation by exercising optional, pre-negotiated milestones, which were part of their original Space Act Agreements, to accelerate development.

Supporting NASA's Mission Needs through Contracts

To support the goal of achieving safe, reliable and cost-effective access to and from the International Space Station for the agency, NASA awarded contracts intended to permit the certification of commercial crew transportation systems to carry NASA astronauts.

Certification Products Contracts (CPC)

Contract

Throughout CPC, the first phase of a two-phase contract, companies worked with NASA to discuss and develop data products to implement the agency's flight safety and performance requirements. This included implementation across all aspects of the space system, including the spacecraft, launch vehicle, and ground and mission operations.

Under the contracts, certification plans were developed toward achieving safe, crewed missions to the space station. It included data that will result in developing engineering standards, tests and analyses of crew transportation system designs. NASA awarded a total of nearly $30 million under the CPC contracts.

Boeing - $9.993 million
Sierra Nevada Corporation (SNC) - $10 million
SpaceX - $9.589 million

Commercial Crew Transportation Capability (CCtCap)

Contract

CCtCap is the second phase of a two-phase certification plan for commercially built and operated integrated crew transportation systems. Two FAR-based, firm fixed-price contracts were awarded in September 2014 following an open competition. Through its certification efforts, NASA will ensure the selected commercial transportation systems meet the agency's safety and performance requirements for transporting NASA crews to the International Space Station.
NASA awarded a total of $6.8 billion under CCtCap contracts.

Boeing - $4.2 billion
SpaceX - $2.6 billion

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