NASA**facts**

Commercial Crew Program

NASA's Commercial Crew Program (CCP) is an innovative partnership to help the United States industry develop space transportation systems that can safely launch astronauts to the International Space Station (ISS) and other low Earth orbit destinations.

CCP will build on NASA's 50-year history of human spaceflight by developing a new transportation industry geared toward opening space travel up to more people than ever before. Since the shuttle's retirement in 2011, the agency is relying on its Russian partner for missions to the International Space Station while the U.S. develops its new capability.

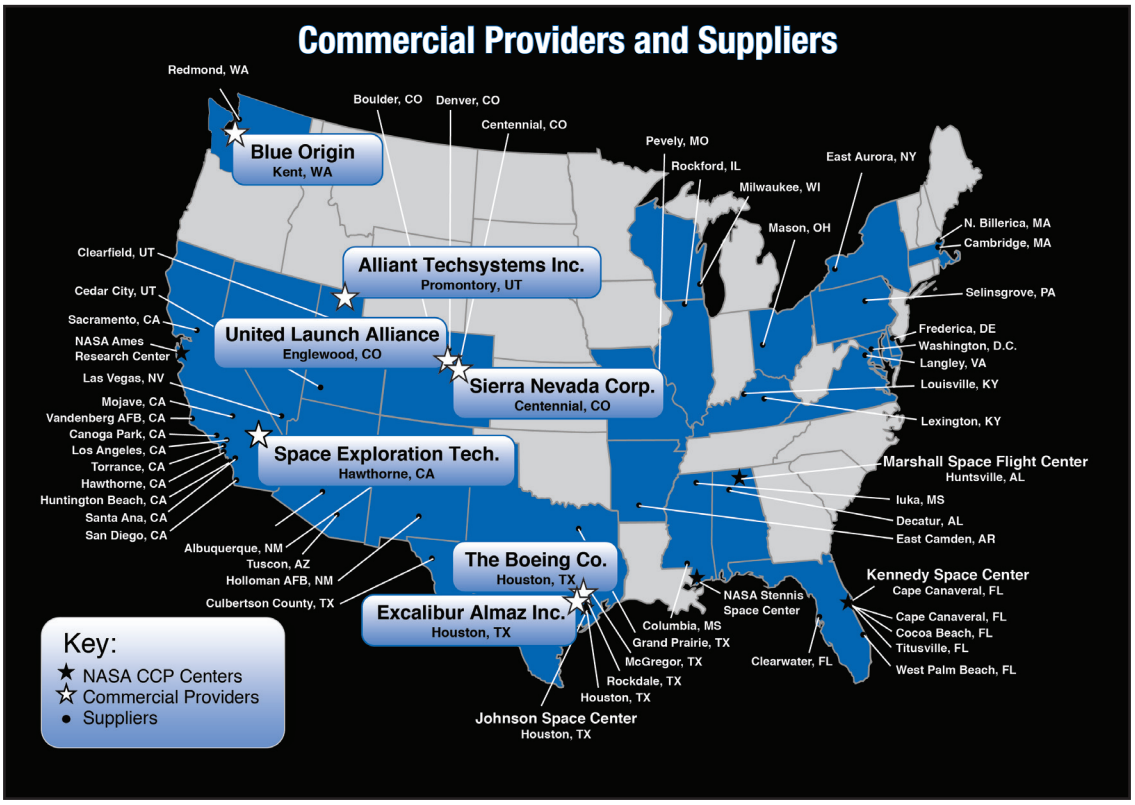
This industry partnership is a revolutionary departure from the space agency's previous approach to human spaceflight because it allows several designs of spacecraft to be managed and built with NASA choosing which ones it wants to use to send astronauts into space. The end result could be multiple systems providing safe, reliable, and more routine and affordable access to space.

CCP is assisting in the development of an American-led space system expected to launch by the middle of the decade. The development program is geared to balance industry's own innovative capabilities to advance technology with NASA's five decades of human spaceflight experience.

CCP is primarily based at NASA's Kennedy Space Center in Florida, the space agency's launch site for crewed space missions. The program began as the Space Transportation Planning Office, which produced strategies and planning that led to the Commercial Crew Program. There are approximately 200 people working in the Commercial Crew Program, with almost half involved in the work at other NASA centers, including Johnson Space Center in Houston.

Requirements for potential commercial space transportation providers include delivering four astronaut crew members and their equipment to the International Space Station and returning them to Earth at least twice a year. A provider also must assure a crew's safety in the event of an emergency at the pad and during launch and ascent. The chosen spacecraft must demonstrate it can serve as a 24-hour safe haven during an emergency in space and be able to stay docked to the station for at least 210 days.

Aerospace companies will have the freedom to let technological ingenuity flourish in developing and demonstrating space transportation capabilities, while CCP develops milestone-based requirements and sets safety standards for launches, on-orbit operations,



landings and missions. NASA's technical expertise and resources also will be accessible to companies from concept to implementation.

Although this collaborative-type approach with commercial companies has not been implemented before for human spaceflight, it is very similar to successful programs NASA operates, such as the Launch Services Program (LSP), which buys launch vehicles for a wide variety of scientific, non-crewed spacecraft.

The costs of developing human-capable spacecraft will be shared because the spacecraft companies can sell flights to customers other than NASA. Several aerospace companies already are standing up programs aimed at fulfilling NASA's CCP goals.

Through this program, NASA also may be able to spur economic growth as potential new space markets are created.

In order to accelerate the program's efforts and reduce the gap in American human spaceflight capabilities, NASA awarded more than $408 million in Space Act Agreements (SAAs) under two Commercial Crew Development (CCDev) initiatives.

The agreements are helping several companies move promising concepts forward in subsystem and system design efforts. Those concepts range from capsules to space planes, as well as potential launch vehicles and developmental boosters.

Development: Round 1

Through Commercial Crew Development Round 1, NASA awarded $50 million in 2010 for several designs that may be chosen to take astronauts into space.

The industry partners NASA selected during the first phase were Blue Origin of Kent, Wash., The Boeing Co. of Houston, Paragon Space Development Corp. of Tucson, Ariz., Sierra Nevada Corp. of Louisville, Colo., and United Launch Alliance (ULA) of Centennial, Colo.

Development: Round 2

Through Commercial Crew Development Round 2 (CCDev2), NASA initially awarded $269.3 million in 2011 to continue the development of commercial rockets and spacecraft.

Later in the year, NASA awarded $46.2 million in optional milestones pre-negotiated as part of some of the original CCDev2 SAAs to help accelerate development.

Each round is independent of previous rounds, allowing all interested companies the opportunity to compete.

The industry partners NASA selected during the second phase were Blue Origin, The Boeing Co., Sierra Nevada Corp., and Space Exploration Technologies (SpaceX) of Hawthorne, Calif.

The program also entered into unfunded Space Act Agreements under CCDev2 to establish a framework of collaboration with other aerospace companies.

As part of the agreements, NASA will review and provide expert feedback to Alliant Techsystems Inc. of Promontory, Utah, ULA, and Excalibur Almaz Inc. of Houston on overall concepts and designs, systems requirements, launch vehicle compatibility, testing and integration plans, and operational and facilities plans.

Integrated Capability: Round 3

In February 2012, NASA issued a call for industry to submit proposals for the Commercial Crew Integrated Capability (CCiCap) initiative. The agency plans to award multiple SAAs valued between $300 and $500 million in the summer of 2012 toward the development of fully integrated commercial crew transportation systems.

A fully integrated system includes a spacecraft, launch vehicle, ground operations and mission control center. NASA's announcement asked industry to propose a base period of approximately 21 months, running through May 2014. In addition, the agency asked for the proposals to contain optional milestones beyond the base period leading to and culminating in a crewed orbital demonstration flight.

Commercial Providers

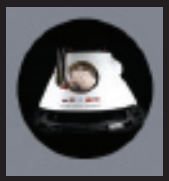
Seven companies are moving forward with designs under the Commercial Crew Program's Commercial Crew Development Round 2 (CCDev2) activities.

ATK Liberty

Blue Origin Space Vehicle

Boeing CST-100

Excalibur Almaz Almaz



Sierra Nevada Dream Chaser

SpaceX Dragon

ULA Atlas V

More online

To find out more about the beginning of a new era in space exploration and NASA's Commercial Crew Program, go to **www.nasa.gov/commercialcrew**

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