

## Kennedy Space Center Overview

After five decades, NASA's John F. Kennedy Space Center continues to lead America's adventure into space. Kennedy shares a boundary with the Merritt Island National Wildlife Refuge on Florida's east coast, where nature and technology co-exist. The refuge includes about 140,000 acres on land and water and provides a wide variety of habitats, including coastal dunes, salt-water estuaries and marshes, freshwater impoundments, scrub, pine flatwoods, and hardwood hammocks that provide habitat for more than 1,500 species of plants and animals.

Kennedy Space Center offers 6,000 acres of land for facilities and roads, and has 7.8 million square feet of building area, and 564 miles of roads, including 184 miles of paved and 380 miles of unpaved roads. The combined spaceport of Kennedy and Cape Canaveral Air Force Station (CCAFS) has served as the departure gate for every American human space mission and for hundreds of rocket launches carrying advanced research and interplanetary spacecraft. From the early days of Project Mercury

to the space shuttle and International Space Station, from the Hubble Space Telescope to the Mars exploration rovers, Kennedy enjoys a rich heritage in its vital role as NASA's processing and launch center.

Kennedy Space Center is transforming to a multiuser spaceport to support both government and commercial customers. The center is looking toward the future. Various commercial companies have expressed interest in leasing NASA's vacant facilities for future work. Several key agreements have been signed. A dynamic infrastructure is taking shape, designed to host many kinds of spacecraft and rockets sending people on America's next adventures in space – to an asteroid, to Mars and other destinations in the solar system.

NASA's Ground Systems Development and Operations Program will provide 21st century ground systems for processing and launch. The Orion Multi-Purpose Crew Vehicle will be assembled, tested and ultimately launched aboard the new heavy lift vehicle from Kennedy. Launch Pad 39B is in the

process of being refurbished to support commercial users and NASA's Space Launch System heavy-lift rocket, which will carry the Orion spacecraft and astronauts beyond low-Earth orbit and farther into outer space.

NASA's new Commercial Crew Program, which is based at Kennedy, is working with commercial partners to create new spacecraft to enable access to low-Earth orbit and the International Space Station from U.S. soil.

NASA's Launch Services Program (LSP) managed at Kennedy Space Center will continue to procure Expendable Launch Vehicles to enable satellites and robotic missions on their journey to learn more about our home planet and unlock the secrets of the universe.

Kennedy will continue to support International Space Station operations as the orbiting laboratory enters its second decade of discoveries. Kennedy workers are preparing various experiments for launch aboard different launch vehicles that will deliver them to the space station.

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## Launch Services Program: Earth's Bridge to Space

The Launch Services Program (LSP) exists to meet the needs of a diverse customer base that includes NASA's space and Earth science, exploration, technology and education requirements, as well as support to the national security community, the National Oceanic and Atmospheric Administration (NOAA) and international cooperative partners. LSP was established at Kennedy Space Center for NASA's acquisition and program management of expendable launch vehicle (ELV) missions. LSP works in the commercial arena to provide cost-effective, safe and reliable services. The main responsibilities of LSP are oversight of launch operations, countdown management, and providing additional quality and mission assurance for each ELV launch.

Since 1990, NASA has purchased ELV launch services directly from commercial providers, whenever possible, for its scientific and applications missions. All ELVs use the same basic technology to get into space — two or more rocket-powered stages, which fall away when their engine burns are complete.



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## Commercial Crew Program

Kennedy is spearheading the way to return NASA astronauts to low-Earth orbit in safe, reliable and affordable space transportation systems through NASA's Commercial Crew Program (CCP).

The 2010 NASA Authorization Act established commercial providers as the primary means for future crew transportation to the International Space Station. The objective of CCP is to invest in and work closely with industry providers to produce a certified end-to-end crew transportation system capable of flying to and from the space station.

Through multiple competitive development phases, NASA and its government and commercial partners are laying the foundation for future commercial transportation capabilities, upon which commercial space companies can market transportation services to the U.S. government and other customers.

To accelerate the program's efforts and reduce the gap in American human spaceflight capabilities, NASA awarded more than \$1.4 billion in Space Act Agreements under two Commercial Crew Development rounds and the Commercial Crew Integrated Capability initiative.

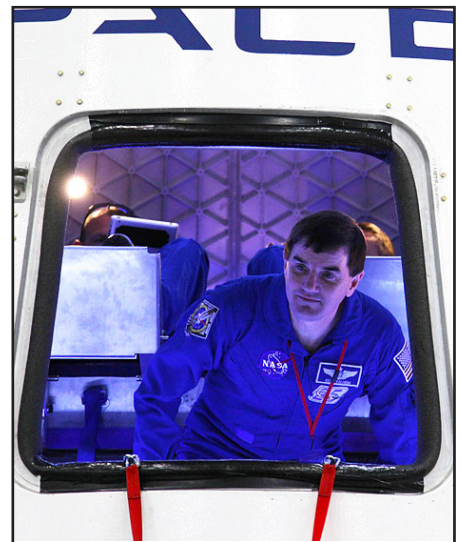
The pay-for-performance agreements enable companies to test and mature their space systems in a methodical, disciplined fashion drawing upon NASA's 50 years of human spaceflight experience. The three integrated space systems include two capsules, a space plane, and two different rockets, maximizing the diversity at this early stage in development.

NASA also selected three companies to conduct certification activities under contracts valued around \$30 million total, which is the first step to certify commercial spacecraft for NASA astronauts bound to and from the International Space Station.

Advances made by these companies during the first contract phase, known as the Certification Products Contract, will begin the process of ensuring integrated crew transportation systems will meet agency safety requirements. Efforts also will enable the earliest transportation to the space station, targeted for 2017. The second phase of certification efforts will certify an end-to-end space system with a crewed demonstration flight to the station.



Dream Chaser/Atlas V



Dragon/Falcon 9



CST-100/Atlas V



## Ground Systems Development and Operations Program

The Ground Systems Development and Operations (GSDO) Program was implemented at Kennedy to modernize its facilities for multiple commercial and government customers. The goal of the GSDO Program is to transform the Florida launch and range complex by implementing a focused set of investments to its infrastructure, creating a multiuse spaceport of choice for NASA and other users. The program aligns with the needs of civil, national security, and commercial enterprises, ultimately extending to the international space community.

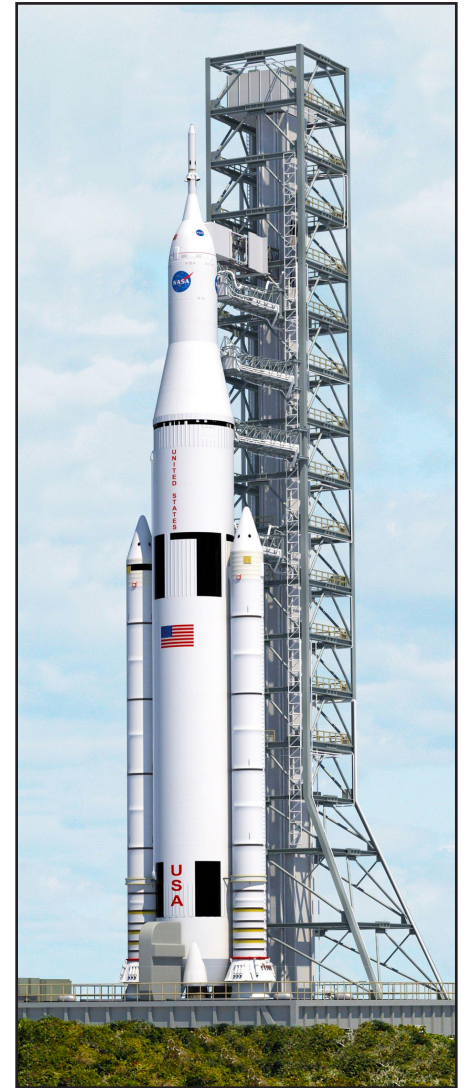
According to the NASA Authorization Act of 2010, the program will focus primarily on launching the Space Launch System (SLS) and its human spacecraft, the Orion Multi-Purpose

Crew Vehicle (MPCV). But the transformation also includes provisions to allow commercial users to take advantage of unique Kennedy capabilities, including the Shuttle Landing Facility, Orbiter Processing Facilities, the Vehicle Assembly Building, and Launch Complex 39. The program promotes the repurposing of Kennedy capabilities for future users who will process and launch from the center and CCAFS.

The SLS Program will develop the heavy lift rocket that will launch the Orion spacecraft, other modules, and cargo. The SLS will have an initial lift capability of 70 to 100 metric tons, evolvable to 130 metric tons to lift Orion, and be a backup system for space station cargo and crew delivery. The Orion test article already is here at Kennedy in the Operations & Checkout Building high bay where manufacturing processes and efficiencies are being developed for the spacecraft.

Orion features dozens of technology

advancements and innovations that have been incorporated into the spacecraft's subsystem and component design. It includes both crew and service modules, a spacecraft adapter and a launch abort system. Orion will serve as the primary crew vehicle for missions beyond low Earth orbit, and will be capable of conducting regular in-space operations including, rendezvous, docking and extravehicular activities.



## Center Planning and Development Directorate

The Center Planning and Development Directorate (CPDD) provides strategic leadership and management integration of center planning activities and partnership development initiatives to enable Kennedy as a multiuser spaceport supporting both government and commercial launch providers and their customers.

Serving as Kennedy's "front door" to industry and other government organizations, the CPDD develops strategic and business partnerships that advance NASA's and Kennedy's goals.

CPDD also is responsible for center land use planning and execution, development of spaceport infrastructure and business strategies, and the preparation and coordination of a Kennedy Space Center Master Plan with NASA organizations and external stakeholders.



## Economic Impact

NASA's Kennedy Space Center remains a very significant economic driver in Brevard County and a major contributor to the economic health of the state of Florida. Analysis of the Fiscal Year 2012 expenditures concludes that overall NASA activities and ones specifically related to Kennedy across Florida contribute about \$1.3 billion in wages and purchases to the state economy. Economic models have estimated that both this direct spending, as well as the subsequent indirect income and job creation, results in a \$2.15 billion total economic impact to Florida. This impact is created through employment of an estimated state-wide, NASA-related work force of 16,545, with wages of \$1.2 billion in income, resulting in about \$263 million in federal, state and local taxes. For each Kennedy job, an additional job is created in the secondary market throughout the state. NASA, Kennedy and Florida have a long standing, demonstrated economic interdependence. In this post-shuttle era, Kennedy will continue to stimulate the economy with the additions of NASA's Exploration Ground Processing, Ground Systems Development and Operations Program and Commercial Crew Program, as well as with new space research, technology projects and the agency's Launch Services Program.



The Propellants North Administrative and Maintenance Facility in the Launch Complex 39 area of Kennedy Space Center in Florida is NASA's second to be Platinum-rated by the U.S. Green Building Council's (USGBC) Leadership in Energy and Environmental Design (LEED) certification system.



Workers receive training atop a mast climber that is attached to launch simulation towers outside the Launch Equipment Test Facility at NASA's Kennedy Space Center in Florida. The facility establishes part of the needed launch and processing infrastructure to support the Space Launch System Program and works toward transforming the landscape of the launch site for a multi-faceted user community.



In June 2008, Kennedy leased land to Florida Power & Light (FPL) to build a 10-megawatt photovoltaic (PV) system for FPL's electricity generation purposes. As in-kind consideration for use of the land, FPL provided Kennedy a separate one-megawatt PV system valued at \$6.4 million. Kennedy's one-megawatt facility produces almost 1,800 megawatt-hours annually, saving NASA more than \$160,000 in Fiscal Year 2012 and reducing greenhouse gas production by more than 1,000 tons annually. FPL's 10-megawatt facility produces almost 19,000 megawatt-hours and avoids 10,306 tons of carbon dioxide emissions annually.



Robert Mueller, at center, chief of the Surface Systems Office, talks to media representatives touring the Swamp Works at NASA's Kennedy Space Center in Florida. Kennedy's Swamp Works provides rapid, innovative and cost-effective exploration mission solutions, leveraging partnerships across NASA, industry and academia.

National Aeronautics and Space Administration

John F. Kennedy Space Center  
Kennedy Space Center, FL 32899

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