



March 2019

Capture2 Space Force & NASA Report

An analytical review of the United States Space Force and the National Aeronautics and Space Administration



Understanding the United States Space Mission's Market Space

This year will celebrate the 50th anniversary of man's first steps on the moon, and still the world's fascination with space grows stronger than ever. Open the news on any given day and you are likely to find an article on the topic, be it an article about the latest commercial space launch, the end to a Mars rover (and the creation of a Mars helicopter!), making calls to deep space, or tracking meteors headed toward earth.

In the Government contracting world, the most relevant headlines are generated by the continued development of the new US Space Force and NASA's plans to return to the moon. So, while temperatures may be cold in space, the opportunities for space-related contracts are hot! Proposed 2020 budgets from the White House and NASA have just been released detailing a few opportunities and Team Capture2 is here to help break them down for you, including: What types of contracts to expect, what sector they will come from, and when to expect to see them.

Section 1 - United States Space Force (USSF)

- Why, how, and when will this new military branch be established?
- What types of work will be available under this proposed new branch of the military in the next five years?

Section 2 - NASA #Moon2Mars

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- What is the new Moon to Mars mission for NASA?
- What types of work will be done to complete this mission?





United States Space Force (USSF)

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While it's fun to imagine Sci-Fi-like space vehicles traveling at light speed, shooting lasers at each other, the fact remains that Space Force will likely be more about the defense of our assets in space than any sort of space battles. Another thing the Space Force will not do is to take over the role of NASA in peaceful space exploration. So, what exactly will it do? The White House states, "[T]he United States Space Force would be authorized to organize, train, and equip military space forces of the United States to ensure unfettered access to, and freedom to operate in, space, and to provide vital capabilities to joint and coalition forces in peacetime and across the spectrum of conflict" (Space Policy Directive 4).

The United States Space Force Strategic Overview further delineates the mission areas for the USSF:

- · Space situational awareness
- · Satellite operations

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- · Command and control of military space forces
- · Military space operations to enable joint campaigns
- · Space support to land, air, naval, and cyber forces
- · Spacelift and space range operations
- · Space-based nuclear detonation detection
- · Offensive and defensive space operations to achieve space superiority

This will likely include a lot of counter-space measures, or actions to both protect our assets in space, and to provide backups to those systems should that layer of communications be lost. Our satellites are perhaps our most valuable assets: The data transmitted through satellites control our global positioning systems, communications, helps monitor our weather, and so much more. An attack that jams the signals to our satellites would have a debilitating effect on both our military and civilian operations. While our GPS3 satellites will be harder to jam, protecting these assets is going to be a main component of any space-based military efforts.

The physical destruction of the satellites is viewed as a lower level threat. This was demonstrated when China destroyed one of its own aging satellites. The explosion caused an aftermath of uncontrollable space debris, which dramatically increased the risk of damaging not only their own functioning satellites, but those of allied nations.

China and Russia both established Space Forces with capabilities focused on surveillance, signal jamming, and other space and counterspace measures. Understanding their capabilities and the best response to the threats they impose will be an important goal. There is a combat command specified in the strategic overview for the USSF with a focus on space warfighting operations as well.

Initially, though, the US Space Force's mission may be more bureaucratic than technical as it moves through the slow process of becoming established.

President Trump's proposed 2020 budget includes a five percent increase in defense spending, with funds earmarked for the establishment of the US Space Force. Initially the US Space Force will be organized as a branch of the US Air Force, not unlike the US Marine Corps' position as a branch of the Department of the Navy. The force will be established gradually over a period of five years. The proposed budget for 2020 is \$72 million and the proposed workforce is 200 employees. The cost to build the new branch will be approximately \$2 billion total over the next five years, with estimates of \$500 million annual maintenance costs once the branch is fully established. The initial setup costs do not reflect the budget for the US Space Command and other agencies or programs supported by other military branches, though it will likely be subsumed by the US Space Force in the upcoming years. The Pentagon also submitted a budget with funding for the establishment of the US Space Force, although the numbers they requested for this endeavor have not been released. The Pentagon budget also included funding for a joint Space Development Agency, another new space-related department. This group would oversee satellite purchases.

2019

Receive authorization from Congress, select USSF Commander, formally establish the command

2020

Set up a base of operations, start transferring key personnel the to USSF

2021-2022

Transfer existing work to the USSF from the other military branches

2023

Establish new operations, including plans and procedures for training and recruitment

If approved, much of the initial work to establish the US Space Force will be in the organization and the shifting of both projects and personnel to the new branch. And while star-imprinted camouflage space suits may not be a requirement, uniforms for the new branch will likely be on the docket. The initial actions required to establish the USSF are:

- Congress must approve White House Space Policy Directive Four to allow the creation of the US Space Force.
- Confirm the new Commander for the US Space Force (expected April 2019) See the organization chart below to understand the relationships created through this action.
- Formally establish the command (expected May 2019).

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- Select a base location Initially, the US Space Force command is likely to be based at Peterson Air Force Base in Colorado, but you can expect some political maneuvering to occur before a permanent location is established. Florida, Alabama, and California are other contenders for Space Force locations, although the headquarters will be established at the Pentagon, like those of the other military branches.
- Consolidate existing operations related to the mission of this service into the new US Space Force (not to include NASA and other non-military organizations). Because space procurement is not currently well-documented, the consolidation efforts will take time, as will determining when it is mission-critical to keep a space-related mission within another military branch.
- Establish plans and procedures for transferring responsibilities, training, recruitment, and establishing bases as needed to support the mission.



Organization Chart from the United States Space Force Strategic Overview

Work transferred to the USSF or started under its command will likely include:

- GPS III space vehicle development and deployment. Lockheed Martin is currently
 under contract to deliver GPS III satellites with sophisticated navigation systems that
 are more resistant to enemy attack. The first GPS III satellite was launched into
 space in late December. Beyond Lockheed Martin's construction contract, expect the
 USSF to take over control of the ancillary contracts related to GPS III, including
 launch, communications, safety equipment, and more.
- Counter-space modeling and engineering contracts, mainly through the USAF National Air and Space Intelligence Center, will be transitioned to the USSF.
- Creating or updating protocols for how our space assets are used to assist in our military efforts, including protecting and maintaining our GPS, communications, and surveillance capabilities.
- Assess and counteract possible threats from the Chinese and Russian Space Forces, currently considered to have the potential for creating a new "space race."

NASA #Moon2Mars

As stated previously, this June, we will celebrate the 50th anniversary of our first steps on the moon. The US has a goal to send astronauts back to the moon within the next decade, to establish an outpost there that can remain active and serve as a stopping point on future missions to Mars and other deeper space destinations. In the signing event for the White House Space Policy Directive 1, President Trump stated, "The directive I am signing today will refocus America's space program on human

WE WILL GO TO THE MOON IN THE NEXT DECADE IN A WAY WE HAVE NEVER GONE BEFORE. WE WILL GO WITH INNOVATIVE NEW TECHNOLOGIES AND SYSTEMS TO EXPLORE MORE LOCATIONS ACROSS THE SURFACE THAN WAS EVER THOUGHT POSSIBLE. THIS TIME, WHEN WE GO TO THE MOON, WE WILL STAY. AND THEN WE WILL USE WHAT WE LEARN ON THE MOON TO TAKE THE NEXT GIANT LEAP - SENDING ASTRONAUTS TO MARS.

—NASA ADMINISTRATOR, JIM BRIDENSTINE

exploration and discovery. It marks a first step in returning American astronauts to the Moon for the first time since 1972, for long-term exploration and use. This time, we will not only plant our flag and leave our footprints – we will establish a foundation for an eventual mission to Mars, and perhaps someday, to many worlds beyond" (NASA Press Release). The efforts to return men to the moon this time will be multi-faceted, involving commercial, federal, and even international cooperation.

A quick look at NASA's social media, including their #Moon2Mars hashtag, is enough to see their commitment to this mission, and the work towards these goals is well underway. NASA shares regular updates on YouTube, and is working to include a mixture of newer and more established contractors in their portfolio. NASA Administrator Jim Bridenstine is confident that the proposed 2020 budget will keep them on track to complete it, despite the decrease in funds being allocated to the mission. There is some debate about the long-term viability of the Space Launch System (SLS) rocket as a component of this mission based on the budget; however, the initial development funding has been secured. NASA is currently floating the idea of using a commercial rocket to fulfill part of the mission originally designated for the SLS. Work for this mission includes a range of capabilities, including designing rockets, landers, instruments, and ground-based controls. Look for many Broad Agency Announcements (BAAs) from NASA that address specific portions of the mission; the slide from NASA's industry forum below indicates the timeline for their major efforts.



NASA's Planned Acquisition Timeline

Based on NASA's current award practices, look for a balance in awards made to older, established Government contractors, and newer contractors with innovative ideas and goals for development. Establishing competition and collaboration through these efforts may bring a new sensibility and cost savings. For example, the most recently awarded contract for Commercial Lunar Payload Services (CLPS), went to nine companies: Astrobotic Technology, Inc., Deep Space Systems, Draper, Firefly Aerospace, Inc., Intuitive Machines, LLC, Lockheed Martin Space, Masten Space Systems, Inc., Moon Express, and Orbit Beyond. Draper is the oldest of these companies/divisions, with a start date in 1973, and has over \$4 billion in obligated funds in FPDS data.

Orbit Beyond is at the other end of the spectrum, formed in 2018 and with no current obligated funds in FPDS.

Legal Business Name	Business Start Date	Primary NAICS
Astrobotic Technology, Inc.	3/25/2008	541715
Deep Space Systems Inc.	10/12/2001	541330
Charles Stark Draper Laboratory, Inc., The	7/1/1973	541715
Intuitive Machines, LLC	12/18/2012	541330
Firefly Aerospace Inc	3/24/2017	481212
Orbit Beyond Inc	8/17/2018	481212
Lockheed Martin Space Operations, LLC	11/2/1982	541690
Masten Space Systems, Inc	2/1/2005	336414
Moon Express Inc.	6/29/2010	336414

The payloads that will be delivered to the moon will include a variety of instruments for both science and technological studies. NASA NextStep is a program within NASA that produces BAAs, which encourage Government-commercial partnerships to help with further mission requirements, from manufacturing in space, to dealing with trash, and other areas. The original BAA for this was released in 2016, however, eight amendments have been added since then. Appendix E:

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WE ARE LOOKING FOR WAYS TO NOT ONLY CONDUCT LUNAR SCIENCE BUT TO ALSO USE THE MOON AS A SCIENCE PLATFORM TO LOOK BACK AT THE EARTH, OBSERVE THE SUN, OR VIEW THE VAST UNIVERSE. IN TERMS OF TECHNOLOGY, WE ARE INTERESTED IN THOSE INSTRUMENTS OR SYSTEMS THAT WILL HELP FUTURE MISSIONS — BOTH HUMAN AND ROBOTIC — EXPLORE THE MOON AND FEED FORWARD TO FUTURE MARS MISSIONS.

> NASA DEPUTY ASSOCIATE ADMINISTRATOR STEVE CLARKE

Human Landing System Studies, Risk Reduction, Development, and Demonstration is currently in RFP status, with proposals due March 25, 2019. Each amendment to the BAA leads to a new awards cycle, so it is important to track the updates. In FBO, the solicitations for these opportunities have solicitation numbers follow the format NNH19ZCQ001K_APP-X. Other numbers that are also used to represent an opportunity will be referenced in the notice.

There is an almost constant churn of BAAs out of the various NASA departments as they strive to maintain a fast development pace and to split the work components into the smallest logical pieces. There are many ways to keep up with these activities:

- Subscribe to the NASA News Releases.
- Follow NASA on any of their numerous Social Media channels.
- Look out for Regional Outreach Events in your area. Two events are listed by the Office of Small Business Programs right now:



- A. Phoenix, AZ No date yet
- B. San Diego, CA, July 25-26 (Navy Gold Coast Event)
- Watch for NASA Opportunities in FedBizOpps, Capture2Proposal, or other Government opportunity search engines. A new RFI for Rapid IV Spacecraft was announced on March 15th, and others are likely to follow.

Conclusion

There are many great opportunities for Government contractors related to the US Space Force and NASA coming down the pipeline. While new work through USSF is still a few years away, development occurs every day that relates to its mission. Keeping abreast of the developments in each area is crucial to being prepared when those opportunities strike.

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