

AEROSPACE STARTUP COMMERCIALIZATION · GO-TO-MARKET

Navigating NASA Procurement for New Startups

How the agency is organized, how it buys, and where a small company can realistically find its way in.

Know your customer

The National Aeronautics and Space Administration (NASA) was established in 1958, in the wake of the surprise launches of Sputniks I and II by the Soviet Union, and the dismal performance of the US satellite program, managed by the National Advisory Committee for Aeronautics (NACA).

Today, NASA has a staff of more than 17,000 engineers and scientists. There are five mission directorates, each focused on one of NASA's major space and research activities. These directorates plan and manage all of NASA's business, but the program-management responsibilities are delegated to a network of centers and facilities. There are nine centers, plus the Jet Propulsion Laboratory (JPL) and seven test and research facilities.

NASA's annual budget is roughly \$25B, with a large percentage outsourced. Research funds are dedicated to the design, fabrication and test of mainly one-off or small quantity, complex systems, e.g., space capsules, Moon landers, Mars rovers, deep-space probes, or experimental aircraft.

"Commercialization" in the context of NASA, is:

- 01 a technology is "infused" into a major program, e.g., a space vehicle or experimental aircraft;**
- 02 further developed by another Government agency, such as DoD for a weapon/system;**
- 03 funded and marketed by the company, or a commercial venture, under a license, or other arrangement.**

Startup businesses with a "Go-to-Market" mindset must take this into account when deciding to seek NASA business.

It's a daunting challenge for a new startup to find its way to the right organization, project and individual scientist or engineer, where the match can be made between a NASA project's needs and what the company has to offer.

To solve this puzzle, it's important to understand how NASA is organized to accomplish its missions; and how it procures goods and services.

Starting at the top, a brief description of each of the Agency's mission follows:

Aeronautics Research Mission Directorate (ARMD)

With media attention given to the Moon exploration mission, Artemis, the startling images from James Webb, and the Mars rovers, it's easy to overlook aeronautics, the "first A" in NASA. But there's a lot going on. The ARMD Quesst program is seeking to demonstrate that super-sonic flight is possible without the sonic boom, making high-speed commercial flight possible. Work is being done on advanced air mobility and ultra efficient airliners. While much of ARMD's work is being done by large prime contractors, small startups have a role in areas such as CFD simulations and AI to solve complex air traffic management challenges.

Exploration Systems Development Mission Directorate (ESDMD)

This is where the future man-in-space programs are being planned and managed. SLS, the rocket capable of carrying Orion to the Moon and beyond. Orion, the spacecraft that will perform deep-space missions, and Gateway, the space station capable of entering a lunar orbit and sending crews to the Moon surface. ESDMD is also where research and development programs are being funded for advanced space suites, life-support systems and technologies to make Moon and Mars habitable. Small startup companies have played important roles in these areas.

Science Mission Directorate (SMD)

The Hubble Space Telescope, and the James Webb Space Telescope (JWST) have been newsworthy. And the recent launch of Europa Clipper, with its mission to study Jupiter's moon, Europa, has made headlines. Lesser known, but important, the smallsat/cubesat programs have provided opportunities for small startups to lead the design and launch of clusters of special-purpose satellites. SMD focuses scientific research programs and deploying satellites and space probes to answer fundamental question about the Universe. Instruments aboard the Mars rovers were developed by small startup companies.

Space Technology Mission Directorate (STMD)

SMTD's mission is to look beyond today's space research efforts and develop new technologies and capabilities that can be used by future NASA missions, for both scientific and human exploration. The "Game Changing Development Program" explores technologies that may lead to entirely new approaches to space exploration. And this is the "home" of the Small Business Innovative Research (SBIR) and Small Business Technology Transfer (STTR) programs.

SBIR and STTR are the premier programs giving small businesses access to NASA funding.

Space Operations Mission Directorate

The Space Operations Mission Directorate is responsible for supporting human exploration missions and operations, and current and future space operations in and beyond low Earth orbit. The Directorate has oversight for all services to the International Space Station. In addition, the Directorate operates and maintains all space transportation systems. The Directorate also manages NASA's extensive space communications and navigation services, where small companies have played an out-sized role in developing space-qualified modules and components.

The centers, facilities and JPL conduct research in support one or more of the five mission directorates. **This is where startup companies begin their search.**

01 Ames Research Center

02 Armstrong Flight Research Center

03 Glenn Research Center

04 Goddard Space Flight Center

05 Jet Propulsion Laboratory

11 Goddard Institute for Space Studies

12 Katherine Johnson IV&V Facility

13 Michoud Assembly Facility

06 Johnson Space Center

07 Kennedy Space Center

08 Langley Research Center

09 Marshall Space Flight Center

10 Stennis Space Center

14 NASA Engineering and Safety Center

15 NASA Safety Center

16 Wallops Flight Facility

The list is pretty long. But there are ways to simplify your search....

How does NASA buy?

Because the Government is spending taxpayers' money, Congress has put tough rules and regulations in place, allegedly to ensure that the money is spent wisely and to prevent corruption.

Of course, that's a pipe dream. Money is lost, misdirected and outright stolen every day. Nonetheless, all purchases for goods and services by the Government are governed by a complex set of rules, the Federal Acquisition Regulation (FAR). Most large agencies, have created another level of agency-specific rules. For NASA, it's the "NASA FAR Supplement (NFS)." Startups doing business with NASA will need legal advice on how to navigate FAR and NFS clauses.

In addition to the FAR and NFS, there are strict rules regarding how business opportunities are published, and how NASA's mission and research requirements are generated, and how proposals are treated. The procurement process is complex and time consuming:

- 01 It starts with the identification of needs that may arise from new missions, technological upgrades, or research initiatives. Scientists, engineers, and mission planners collaborate to outline the specifics.
- 02 The next step, developing detailed requirements and specifications, transforms broad ideas into actionable plans with technical requirements, performance criteria, quality standards, and timelines.

- 03 Finally, the solicitation, an invitation for industry to submit proposals. Solicitations can be in the form of Requests for Proposals (RFPs), Invitations for Bids (IFBs), or Broad Agency Announcements (BAAs).
- 04 IFBs are used in sealed bidding, cases where the goods or services are well documented, and usually available from multiple sources. RFPs are used for negotiated actions, such as R&D contracting. Solicitations will contain specific instructions and/or formats for data that bidders/proposers must follow. As a Go-to-Market startup, you will seldom respond to an IFB.
- 05 The BAA is a tool used by NASA for acquisition of basic and applied research, and are an expression of interest only and do not commit the Government to make an award. These are a reflection of NASA's long-term planning, and startups may wish to avoid them until you can "see" a long term.
- 06 NASA teams review each submission, assessing the proposer's technical ability, cost, past performance, and innovation. Contracts will be fixed-price, cost-reimbursement, or time-and-materials, depending on the scope and complexity.

NASA spends around \$19B annually. The lion's share is in the form of major system-development contracts to aerospace prime contractors.

They are skilled, and have the resources to participate in NASA's extended bidding process. In fact, primes often have better insights into future NASA missions and systems than NASA itself. You can find prime contractors' "fingerprints" on many new NASA programs. There are significant opportunities for subcontracting to these primes, but you'll encounter NASA's procurement rules, with additional clauses-designed to protect the prime. NASA has programs to help small businesses connect with primes.

Help for the small business

To manage this complex procurement system, NASA has created an equally complex procurement organization.

But it's not necessary, as a startup, to be concerned with complexities of the upper-level organizations. **What's important is to establish contact with the NASA center procurement offices as a qualified small business.**

Each center has an Office of Small Business Programs (OSBP) that will assist small companies get properly registered. You will need to get a DUNS Number (Data Universal Numbering System), register with the System for Award Management (SAM.gov), register with the NASA Vendor Data Base (NVDB), and set up a ProSAMS account, which you will need to obtain bidding information and submit proposals.

The OSBP representative will arrange for briefings by agency staff working in your areas of interest. Your areas of interest will be defined by your NAICS classifications. The North American Industry Classification System is the standard used by the Government in classifying business establishments. There's no cost to register, and it's wise to select any and all codes relevant to your business, so potential business opportunities won't be closed off.

The Agency has a goal of contracting at least 3% of its outside contracting to companies with under 500 employees. This may sound like peanuts, but considering that NASA's outside procurement is around \$15B-\$20B, 3% is not bad.

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Agency goal for outside contracting to companies with under 500 employees

\$15–20B

Approximate annual outside procurement spend

<500

Employee threshold defining a small business for this goal

With pressure from Congress, NASA has gradually introduced programs to make it easier to do business. Many are focused on the service industries, such as food service, janitorial contracts, data entry, etc. But some may be available to startups with innovative technology or software. Take a close look at what's available to see if any can give you a competitive edge.

Here's a sample:

Small Disadvantaged Business Initiative Strategy

Promotes equity and inclusion by increasing opportunities for small disadvantaged businesses to participate in NASA contracts.

Service-Disabled Veteran-Owned Small Businesses (SDVOSBs)

Participants compete for selected sole-source and set-aside contracts.

8(a) Business Development Program

Provides help for firms owned and controlled by socially and economically disadvantaged individuals. Provides management, technical, financial, and contracting preferences.

HUB Zone

NASA limits competition for certain contracts to businesses in historically underutilized business zones. It also gives preferential consideration to those businesses in full and open competition.

Mentor-Protégé Program (MPP)

Provides opportunities for small businesses to participate in NASA prime contracts and subcontracts.

Now, do your homework

Start with realistic assessment of what you have to offer NASA, and what applications you see as go-to markets beyond NASA.

Remember, NASA does research, and funds one-off, big-science projects. There is no production.

Successful commercialization is a technology becomes “embedded” in a major program. If a continuous stream of research projects is your corporate goal, fine. If your startup expects to commercialize and go-to-market, then developing an achievable commercialization strategy must be “front and center” from the very beginning.