# Can Jeff Bezos Make Money in Space?

The Amazon founder's Blue Origin has expanded dramatically in the past three years as it looks to be a player in the lucrative market for government and commercial business.

*By Dan Neil and Andy Pasztor*
Updated April 12, 2019 1:25 pm ET

After spending the past decade eclipsed by the exploits of Elon Musk's SpaceX, Jeff Bezos ' Blue Origin space company is over being small and done with being quiet.

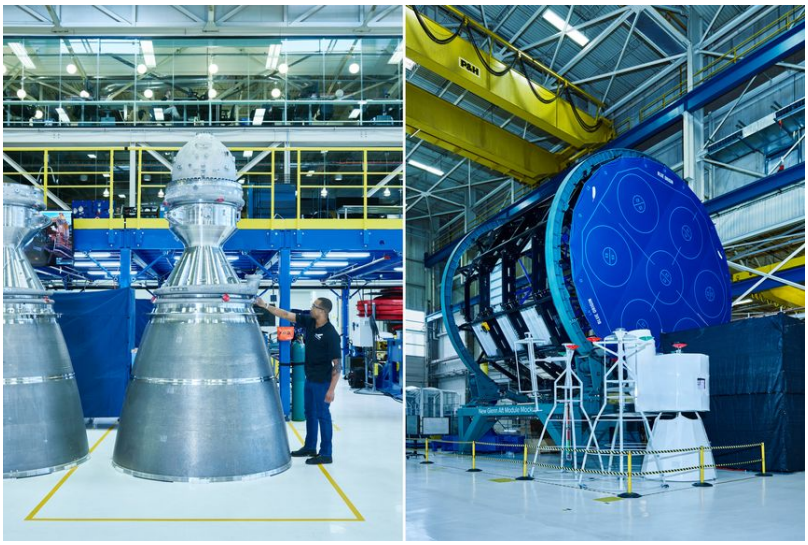
Ten years ago the company consisted of the Amazon magnate himself, a few researchers and an experimental lander that fit on a flatbed truck. There was no sign outside its industrial park headquarters in a Seattle suburb, and the boss didn't talk to the media, period.



Today the company—funded by Mr. Bezos to the tune of $1 billion a year—employs more than 2,000 people at five sites, including a launch facility in West Texas where later this year it will begin manned tests of its suborbital space tourism rocket, named New Shepard, in honor of American space pioneer Alan Shepard.

Blue Origin's next project literally dwarfs New Shepard: the mighty New Glenn, a 300-plus-foot orbital, reusable rocket, due to fly first in 2021. The company has constructed a sprawling new assembly facility next to Pad LC-36 at Cape Canaveral, Fla., where it plans to build, service and launch a fleet of these reusable mega-rockets. Representing a reported $2.5 billion investment, New Glenn will offer customers up to 45 tons a lift into low-earth orbit—a third more tonnage than SpaceX's largest rocket currently, the Falcon Heavy.

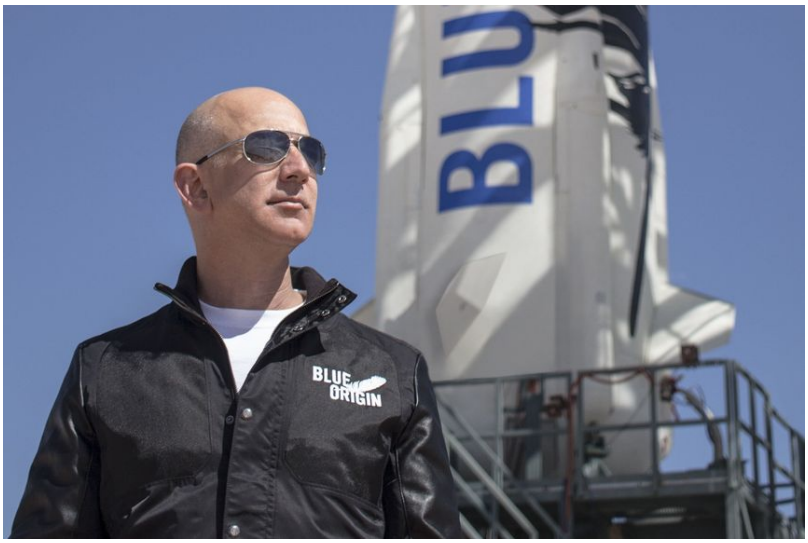
To get some idea of the step-up in size, "New Shepard will fit in the hold of New Glenn," said Clay Mowry, vice president of sales, marketing and customer experience.



Blue Origin has boosted production of its BE-3 and BE-4 rocket motors for its use as well as for commercial sale. Here, from left, the BE-4 engine and an engineering mockup of the aft portion of Blue Origin's orbital launch vehicle. **PHOTO:** SPENCER LOWELL FOR THE WALL STREET JOURNAL (2)

At this rate, the company might need to retire its motto *Gradatim Ferociter*—"step by step, ferociously." It was always a little hard to picture, anyway.

In its owner's quest to commercialize space, Blue Origin has expanded dramatically in the past three years, Chief Executive Bob Smith said in an interview at the company's headquarters in Kent, Wash. He adds that the company will continue to add capital investment and new customers. One example: The company has tooled up to serially produce its signature BE-4 and BE-3 rocket motors, for itself and client/competitors such as United Launch Alliance.




Amazon.com founder Jeff Bezos, shown in 2015, spends $1 billion a year on funding his Blue Origin space firm. **PHOTO:** BLUE ORIGIN/AGENCE FRANCE-PRESSE/GETTY IMAGES

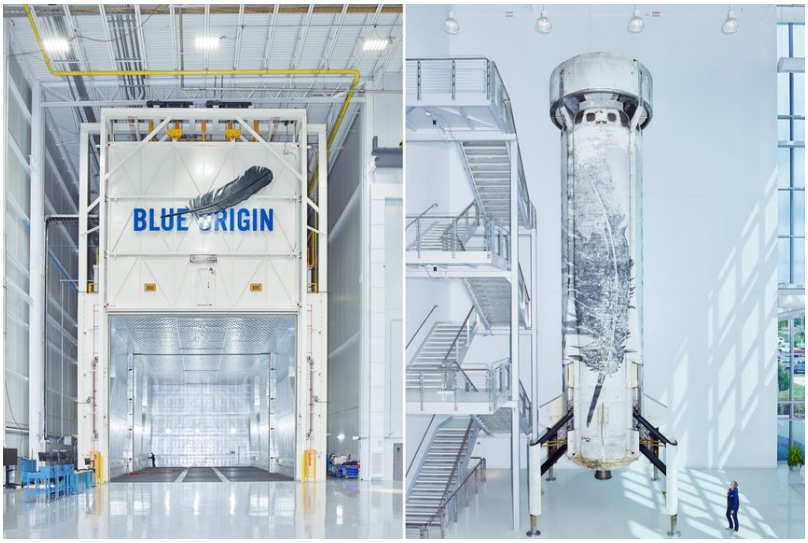
As Blue Origin scales up, it finds itself courting the same vast bureaucracies Mr. Bezos once held at arm's length, including the National Aeronautics and Space Administration, the Pentagon and the National Reconnaissance Office, which operates the nation's spy satellites. Until a few years

ago, Mr. Bezos didn't publicly entertain the idea of competing for federal business. Now, the company is openly campaigning for lucrative, risk-intolerant government and national security payloads. "We need those customers," Mr. Smith says. "Customers make you better."

Howard McCurdy, an American University professor and space historian, said as entrepreneurial companies mature, it's hard for them to resist the lure of federal funding. "The natural tendency is to go the government route," he adds, even if such a reset entails more red tape and demands greater transparency.

Mr. Bezos declined to comment for this article.

There are potentially billions in new public money on the table. In June 2018, the Trump administration proposed the creation of a U.S. Space Force, an independent branch of the armed services, due to be activated in 2020. In March, Vice President Mike Pence, doubling down on pledges to return American astronauts to the moon by the middle of the next decade, for the first time suggested they could travel on privately built rockets.




Blue Origin has been pursuing government and commercial business as it looks to catch up with rivals like SpaceX. Here, from left, a Blue Origin factory in Cape Canaveral, Fla., and the New Shepard rocket. PHOTO: SPENCER LOWELL FOR THE WALL STREET JOURNAL (2)

Such trends "give us confidence that when we actually come into the market, there will be sufficient launch volume to get a good amount of return," says Mr. Smith.

With New Glenn, the company is racing against its former, more deliberate ways. In October the company was one of three launch providers who received Air Force funds, intended to help potential launch partners defray costs incurred in preparing to fly national-security payloads.

But in March, when a draft of the Air Force's bake-off rules became public, they stipulated there would be only two winners, not three, as Blue Origin had hoped. More damaging to Blue Origin's

cause, the rules required both systems to be selected by 2020, in order to meet Congress's deadline to stop using Russian-made engines."

The rules would appear to leave New Glenn out of the running and also eliminate United Launch Alliance, which buys BE-4 engines for its Vulcan Centaur rocket. The winners: SpaceX and Northrop Grumman.

Blue Origin fired up the lobbying afterburners in response to the apparent snub, taking its case to the public and Congress. In a letter to Air Force Secretary Heather Wilson dated March 28, House Armed Services Committee Chairman Adam Smith (D., Wash.) pushed for a delay and reassessment, arguing a hasty decision "risks undermining the Air Force's goal of maximizing and sustaining fair and open competition, and without sufficient information to properly evaluate next-generation launch systems."


Blue Origin's reusable New Shepard rocket, whose aft portion is shown here, was named in honor of American space pioneer Alan Shepard. PHOTO: SPENCER LOWELL FOR THE WALL STREET JOURNAL

The release of the Launch Service Provider agreement was put on hold. In March, the commander of the Air Force Space and Missile Systems Center, Lt. Gen. John F. Thompson, told the Senate Armed Services Committee that the Air Force opposed delay or modifications to the selection criteria.

The trouble for Blue Origin is that, when it comes to payloads of national interest, nothing sells like success. SpaceX continues to fly complex, confidence-inspiring missions—including the first unmanned test of the Dragon Crew capsule docking with the International Space Station—while New Glenn will remain in spacedock for two more years, at least.

The clock is running on other civil projects that BO would like a piece of. At a NASA employee meeting April 1, administrator Jim Bridenstine suggested for the first time that SpaceX's Falcon Heavy may be an option for getting U.S. boots on the moon by 2024.

“I wouldn’t say [Blue Origin has] a toehold yet in government contracting,” says veteran satellite-industry consultant Roger Rusch. “They haven’t made a breakthrough.”

For its next act, Blue Origin is working toward a mammoth rocket called New Glenn that is set to launch in 2021. Here, a specially built assembly facility for the New Glenn in Cape Canaveral, Fla. PHOTO: SPENCER LOWELL FOR THE WALL STREET JOURNAL

On the commercial side, while the demand for heavy-lift launches remains soft, Mr. Smith noted a number of potential growth markets for New Glenn, including deployment of so-called satellite internet constellations comprising thousands of wireless routers, essentially, in low-earth orbit. A cloud above the clouds.

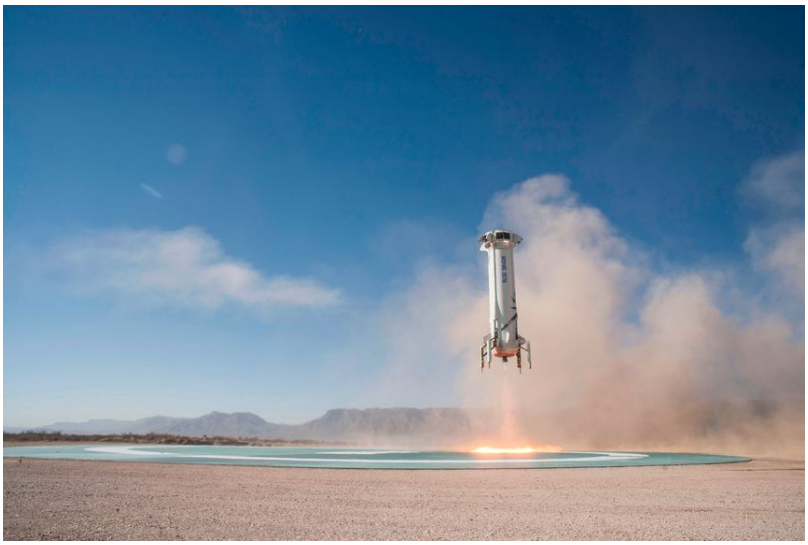
“The demand for data is growing and insatiable,” Mr. Smith says, “and the physics don’t change. If you want to move data around the world, you need lots of satellites.”

One such system was revealed in March when Mr. Bezos’ online shopping empire Amazon confirmed Project Kuiper, an initiative to launch a constellation of 3,236 tiny satellites arrayed at three orbital altitudes, like concentric shells.

Speaking of smaller: Blue Origin also faces competition from a number of lean-running rocket shops that are leveraging the shrinking costs of processes like 3D printing and carbon-composite manufacturing. One such startup is the New Zealand-based Rocket Lab, which has launched 25 satellites into low-earth orbit.

New Glenn’s exceptional size will make it cheaper for constellation-satellite customers, said Blue Origin’s Mr. Mowry, because it will require fewer missions.

“We are bringing a huge vehicle with a lot of capability” and a 22.9-foot in diameter payload bay, Mr. Mowry says. “This is really interesting if you’re scientific and you want to build an interplanetary probe; if you are the [National Reconnaissance Office] and you have got something with a big mirror or antenna.”



The New Shepard booster returns to a landing pad in West Texas after a successful mission in 2017. PHOTO: BLUE ORIGIN/AGENCE FRANCE-PRESSE/GETTY IMAGES

Now that Blue Origin is ramping up its commercial efforts in the very expensive business of space, its rockets aren't the only thing that fill people with awe.

"The fact that Jeff is putting in a billion dollars a year into this?" Mr. Mowry says. "That's impressive, on any level, on any metric you want to apply to that. That level of commitment is unmatched, unprecedented, unheard-of, any un word you want to use. It is incredible."

## Big Ticket

**The New Shepard's crew capsule is slated to bring its first passengers to the edge of space later this year. WSJ columnist Dan Neil says he's in—if the price is right.**

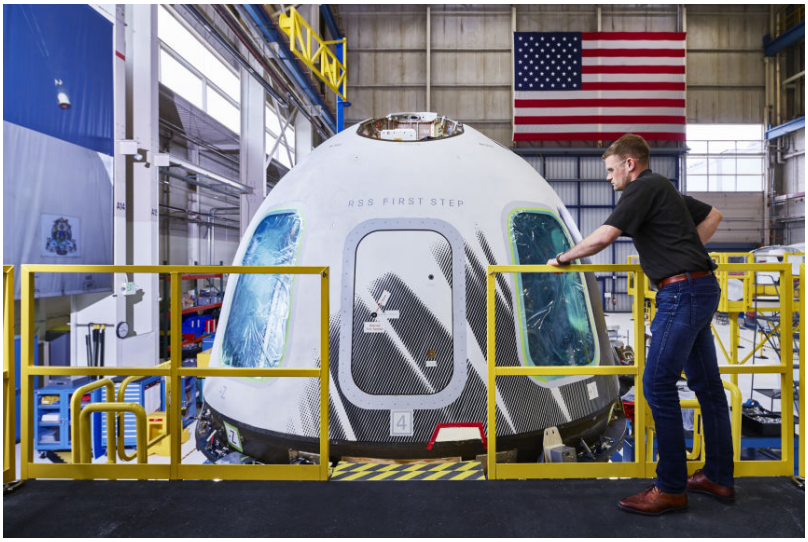



PHOTO: SPENCER LOWELL FOR THE WALL STREET JOURNAL

What moved me most about Blue Origin's factory in Kent, Wash., where the New Shepard tourist rocket is built, was the nearness of it all—the realization that, if I don't fall off a ladder in the next year or so, I will have a chance to soar to the edge of space, 62 miles in altitude, the so-called Karman Line.

Plenty of chances, actually. As Blue Origin execs describe it, New Shepard's West Texas launch site will operate rather like a skydiving outfit: Clients will show up, suit up, receive some

brief training, and blast off; an hour later they will be on the ground again, getting their astronaut certificates and eating lunch.

Sure, I would do it, if I could afford it. Having had a tour of the assembly hall and a walkaround of the single-stage booster and six-person autonomous capsule, I'm completely at ease with all the equipment but my own. I'm what's known in the Air Force as a three-bagger. Bob Smith, Blue Origin's CEO, assured me the ride would be "very gentle," no more physically demanding than a roller coaster. I wondered if he had checked with the janitorial staff at Magic Mountain.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Blue Origin will start flying humans this year but it hasn't announced the maiden voyage for retail customers. "We won't talk prices until we need to, and we don't need to until we actually have an operational vehicle," said Mr. Smith.

T-minus a pregnant pause: New Shepard's price point will resonate because cost is inversely proportional to access, and access—the democratization of space—is the notion that Blue Origin founder and world's-wealthiest-man Jeff Bezos has taken as the company's mandate. In a period of historic concentrations of global wealth, New Shepard risks looking like just another skyrocketing inequality, an experience underscoring the oneness of humanity, brought to you by the forces that keep us apart. Like tickets to "Hamilton."

The price "is certainly a big debate" in the space-watching community, said Tim Dodd, whose "Everyday Astronaut" YouTube channel has more than 280,000 subscribers. Mr. Dodd noted that Blue Origin's competitor, the Richard Branson-funded Virgin Galactic, has announced tickets on its space plane will cost $250,000, with passenger service beginning in 2019. "I would guess [Blue Origin will] likely charge around $150,000 per seat so as to undercut Virgin Galactic," Mr. Dodd wrote in an email.

But in Kent, I found reasons to hope the ticket might not be so dear as that. In person, New Shepard presents as a surprisingly trim and hardy little machine—only 60 feet tall when assembled on the pad, about 20 feet shorter than the in-sky Mercury-Redstone rocket of its namesake, astronaut Alan Shepard. There has never been a manned launch system so approachable, so human-scaled, so ineffably rideable.

New Shepard's construction is science but not science fiction. The fuselage/fuel tank, covered in thermal protection, is fabricated from 2000-series aluminum alloy typical of aerospace, rolled up and welded on special jigs in a high-tech but unexceptional way. Why not build structures with weight-saving carbon-fiber composites? First, I was told, because composites don't play well with cryogenic fuels. Also, I was told, composites' durability for long-term repeated use was unproven.

New Shepard is effectively designed around keeping paying astronauts in those six seats, with maximum reusability and minimum between-flight maintenance, very much like airlines turn around aircraft.

For example: Because the booster separates and falls away below the Karman Line, it isn't exposed to the extreme temps of orbital re-entry. It does get a bit blackened, however, from the uplicking flames during the propulsive landing. In most cases the ground crew will simply recover the booster, carry it back to the launching pad, check it, paint it, fuel it, and fly it. The landing team tries to avoid landing dead-center on the pad. "We don't want to repaint the logo," said Clay Mowry, vice-president of sales, marketing and customer experience.

New Shepard's operating costs, flight to flight, should ideally reduce to the hand work required to recover and prepare the spacecraft, and the cost to tank it up with liquid oxygen and hydrogen (about $250,000). "If you get costs down and still get profitability on every flight, you can have larger addressable market," Mr. Smith said.

Also, the price to fly can be expected to fall as the inventory of seats goes up. The company currently has two boosters in Texas and two capsules, one for people and one for payloads, and is set up for serial production of both. The operational tempo of boosters is expected to be a launch a week. And since the New Shepard system is relatively small and transportable, it could be set up in any geographically appropriate place, although there are no plans to do so.

So how much…about? Mr. Smith declined to ballpark. "In the early phases of our development there will be a different cost curve and therefore different pricing than it would be later at sustained operations," he said.

Awww, man! Is it $150,000? Because if it's six figures, I'm out. But if it's five figures—and it sounds like it could be, maybe, one day—I might be in.

Mr. Dodd, the Everyday Astronaut, agreed that "that the cost to operate a flight might be under a half-million [dollars]." Split six ways, that's only $83,333.33 per astronaut.

I'm sure they will let me keep the jumpsuit. *—Dan Neil*

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**Corrections & Amplifications**

Blue Origin is producing its signature BE-3 rocket motors for client/competitors such as United Launch Alliance. An earlier version of this article incorrectly cited Northrop Grumman. Separately, an Air Force launch contract that Blue Origin was competing for requires the winners to be selected by 2020; an earlier version incorrectly said the winners had to be flying by 2020. Winners of that Air Force contract were SpaceX and Northrop Grumman; an earlier version incorrectly said the winners were SpaceX and United Launch Alliance. Blue Origin's New Shepard rocket doesn't use power-braked descent and lands on a different pad after launch; an earlier version incorrectly said it did use power-braked descent and that it landed on the same pad. (April 11, 2019)

*Appeared in the April 12, 2019, print edition as 'Jeff Bezos Steps Up His Space Quest.'*