NASA Should Build a Superhighway in Space

NASA needs to get out of the rocket business and start doing what it's uniquely qualified for

By Howard Bloom on January 4, 2017

Donald Trump will take power any minute now, and we need to take advantage of the change in the White House to change NASA's focus.

Why? NASA needs to get out of the rocket business and shift its attention to a permanent space transport infrastructure, an Eisenhower-style highway in the sky. An infrastructure with:

Gas stations (propellant depots),

Rest stops and permanent housing—roomy human habitats with windows and vegetable gardens,

Truck stops and freight yards—logistics bases with cargo-handling equipment,

Trucks, SUVs, and dune buggies—Moon-and-Mars ground vehicles; plus tugs to haul loads around in space,

Fuel production equipment—units to turn the water of the Moon and Mars into rocket fuel, breathable oxygen, and drinkable water,

Units to turn the carbon dioxide in Mars' atmosphere into plastics, graphene, and carbon fiber with which 3-d printers can build more habitats, tools, and rovers—more trucks, SUVs and dune buggies.

Units to turn the rusty rocks lying around on the Martian surface into high strength steel for habitats.

Why move NASA into space highway construction? Because no one else will do it. And our future in space depends on it. Our future share in a space economy that United Launch Alliance (a joint venture rocket company from Boeing and Lockheed Martin) estimates will be worth $2.7 trillion in thirty years.

Look, a NASA under a new presidency has a brand new luxury. It can do for space what another government-supported project, the transcontinental railroad, did for trips to California in 1869. NASA can turn journeys to space from an expensive rarity to a possibility available to you and me.

How? The space industry has changed since the days when NASA was landing men on the moon. In that era, 1969 to 1972, really big rockets were made by governments. In fact, by only two governments, the governments of the Soviet Union and the USA. Big rockets were too expensive for anyone else. Rockets were like computers in the days when Thomas Watson, the head of IBM, supposedly said, “"I think there is a world market for maybe five computers."

That prediction was wrong. There are now over two billion computers in the world. You probably own at least two: one in your phone and another in your laptop. Like computers, really big rockets are being democratized. States like China, Japan, Israel, Iran, India, and Pakistan can afford them.

More important, two visionary American billionaires and their private companies have entered the rocket business: Elon Musk with SpaceX and Jeff Bezos with Blue Origin. And those two men are achieving a rocket revolution. The big rockets that government once made for nuclear war were disposable. Use them once and toss them away. So the rockets that governments made for space launches were also disposable. And rockets are expensive. Some have cost more than a billion dollars apiece. The result: using rockets for transportation was appallingly pricey.

Rocket transport was like buying a Rolls Royce, topping off its tank, driving it from LA to San Francisco, then throwing it away in the Pacific Ocean when it ran out of gas and buying another Rolls to drive back from San Francisco to LA. This approach would make the round trip from LA to San Francisco very expensive. The cost would be roughly $700,000. At that price, how many people would make the trip?

But if you bought a Rolls, drove it from LA to San Francisco, refueled it, filled it with paying passengers, and drove it back and forth filled with new passengers until the car wore out, what would that do to the price of the ride? It would bring it down dramatically. In fact, it would make the trip affordable even for your average middle class family.

That’s what Musk and Bezos are doing for space transport. Musk has sent rockets into space carrying satellites to orbit, then has landed those rockets in one piece free for reuse six times, either on an earthly launch pad or on one of his two Autonomous Spaceport Drone Ship landing barges. Jeff Bezos has not quite gone as high into the sky, yet he has done Elon one better. He has launched a single rocket to the edge of space four times, pinpoint-landed that rocket on its landing pad, refueled it, then has flown that same rocket once again. By the end of 2017, both men will have accomplished what John Strickland, the Chief Analyst for a group Buzz Aldrin convinced me to start ten years ago, The Space Development Steering Committee, calls “the Reusability Revolution.”

Right now NASA is throwing money away. It is trying to create a new rocket—the Space Launch System—at a cost of $3 billion a year. In fact, the total development cost of that new rocket will be over $30 billion. And it’s a waste. The SLS will be able to launch 143 tons to orbit. Fabulous. Almost 10 percent more than the mighty Saturn V that put humans on the Moon 48 years ago. But Elon Musk is developing a rocket with nearly three times the throwing power—the Interplanetary Transport System. Meanwhile, by the end of 2017, Musk will launch a heavy lift rocket with twice the capacity of any other operational rocket on earth today, the 27-engine Falcon Heavy.

The NASA rocket, the Space Launch System, won’t be tested until 2018 and won’t be ready for its first manned flight until 2021. Musk’s Falcon Heavy will lift off by the end of this year and should be ready to launch humans in 2018. NASA’s Space Launch System, as you know, will cost over $30 billion to develop. The development of Musk’s Falcon Heavy will cost roughly $2 billion—one fifteenth the NASA cost.

More important, NASA’s SLS will cost between one and two billion dollars for each launch. Musk’s Falcon Heavy will cost roughly $90 million. In other words, you could buy between eleven and twenty two Falcon Heavy launches for the price of one SLS launch. You could buy an entire space program!

And there’s more. Musk has another rocket on the drawing boards, the Interplanetary Transport System, formerly known as the BFR (for Big F…ng Rocket). That one will carry almost four times the load of the Space Launch System. And it, too, will cost roughly one tenth of the SLS to develop and less than one-twentieth to launch.

But Musk is not alone. Jeff Bezos, too, has a really big rocket on the drawing boards. His current rocket is the New Shepard (for Alan Shepard, the first American launched to suborbital space). After that comes a bigger rocket, Bezos’ New Glenn (for John Glenn, the first American to orbit the earth). Then an even bigger rocket, the New Armstrong (for Neil Armstrong, the first American to set foot on the Moon).

But so far, neither Musk or Bezos have announced development of the infrastructure that their rockets will need to make space transport a regular affair. Neither has revealed plans for permanent fuel stations, permanent rest stops, permanent apartments with windows, lawns, and greenery, permanent vehicles to tool around on the Moon and Mars, and the machinery to convert lunar and Martian ice into rocket fuel, oxygen and water. Neither are building the machines to convert Martian “air” into plastics, graphene, and carbon fiber. NASA is at its best when it does what others cannot do. And the new highway in the sky, the new Eisenhowering of space, is what Musk, Bezos, and you and I will need but cannot construct for ourselves.

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Howard Bloom, the author of six books, is founder and chair of The Space Development Steering Committee and a member of the board of governors of the National Space Society. He is currently co-conceiving a multi-planetary project