

Enabling the Satellite Servicing Revolution

Brian Weeden



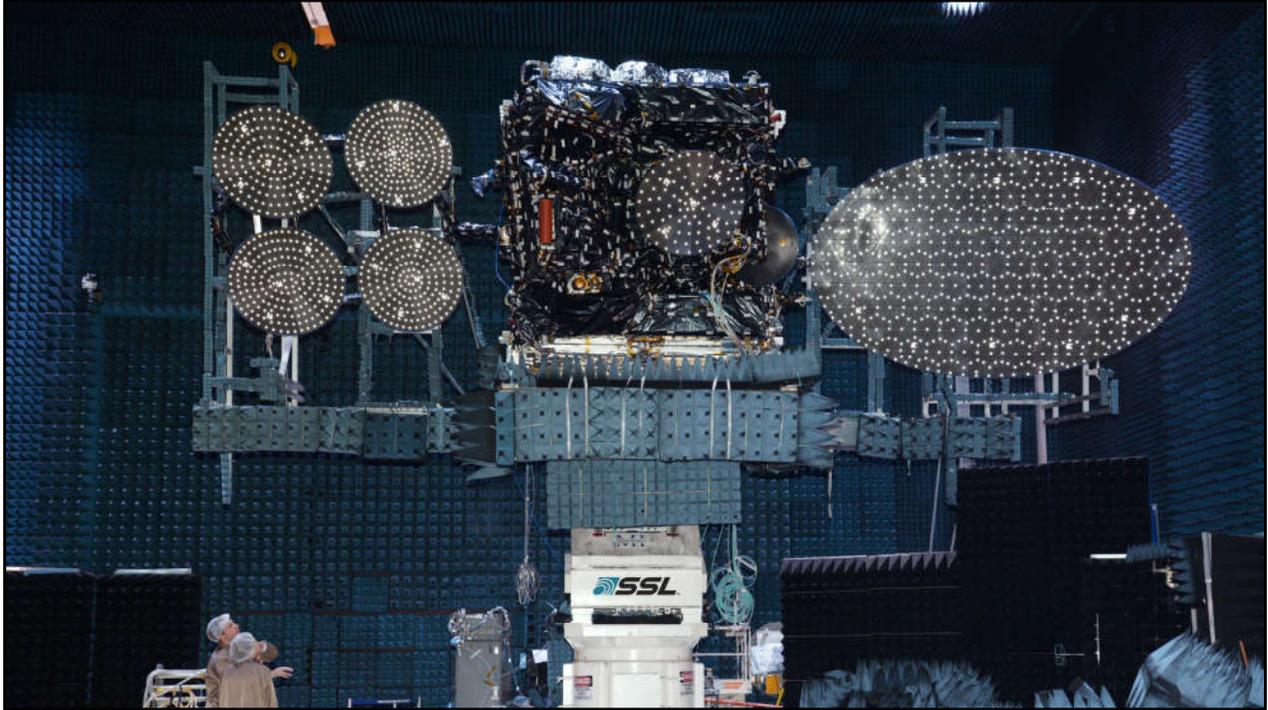
Imagine you are buying a car. You need to buy a car today, but you won't actually get to drive it until 3 years from now.

The car needs to handle all your transportation needs three years from now, and for the next 15 years after that. So you have to figure out what your requirements are today for the better part of the next two decades.

Oh, and you can't change it once you start driving it. You can't put more gas in it, you can't change the oil, you can't add a new stereo. And if it breaks, you can't take it into the shop. You can't even look at it to see what might have gone wrong.

What you buy today is what you get for the next 15 years.

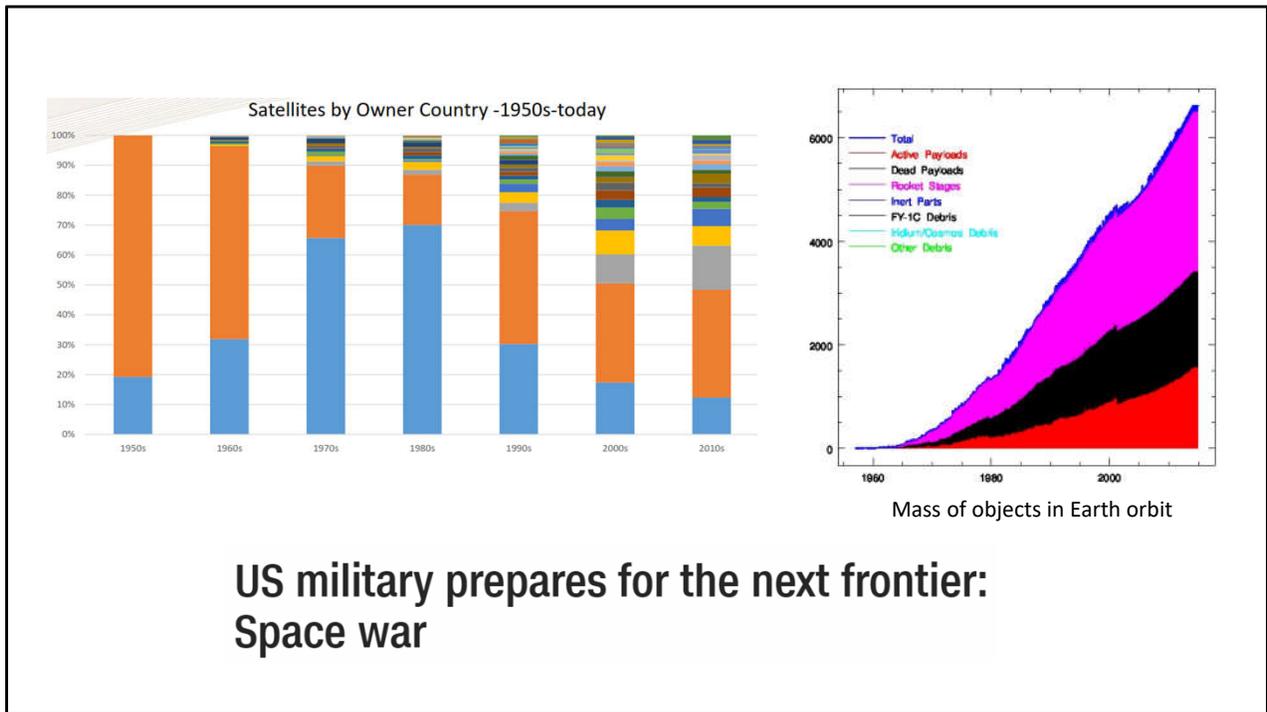
Given that set of conditions, how expensive do you think that car will be? And how difficult will it be to make a good buying decision, knowing the implications if you're wrong about what the future holds?



That's basically how we buy satellites today. And it says a lot about why space is so challenging and expensive.

It can take upwards of 10 years between the time the decision is made to buy a satellite, and it's actually put on orbit. More than that, actually, if you're NASA or the military.

And when something goes wrong with that satellite, you're trying to do detective work from 22,000 miles away to figure out what happened.



To make things more complicated, the space domain itself is undergoing a set of radical changes. The number of countries that are active in space has gone from two in the 1950s to more than 60 today.

Correspondingly, the number of satellites in orbit is also growing. Right now there are about 1,600 active satellites in space, and that number is predicted to grow to several thousand in the next decade.

With all those active satellites also comes dead satellites, also known as space debris. The total mass of stuff left in orbit is rising pretty fast, and all of that could create potential collision hazards for satellites in the future.

And at the same time there are increasing concerns about conflict on Earth extending into space. Satellites are increasingly part of military power, and thus conflicts on Earth, and several countries are developing antisatellite capabilities to deny, degrade, or destroy adversary space capabilities in future conflicts.



The good news is that there's a revolution happening in the space world that might change all this. A range of international companies are working on a set of technologies and capabilities that are collectively known as satellite servicing.

They include the ability to do things like inspect satellites, extend the life of satellites beyond their initial fuel capacity, refuel satellites, assemble new satellites out of modular parts, and remove dead or broken satellites from orbit at the end of life.

All of this could bring about more innovation in space capabilities, which in turn could lead to more amazing socioeconomic benefits from space right here on Earth.

The challenge is how to make sure all this satellite servicing innovation happens in a safe and sustainable manner, and doesn't exacerbate the problems with congestion, space debris, or geopolitical tensions.



One way we're trying to address that challenge is through a new program called the Consortium for the Execution of Rendezvous and Servicing Operations, or CONFERS.

CONFERS is an industry-led initiative with initial seed funding provided by DARPA that aims to leverage best practices from government and industry to research, develop, and publish non-binding, consensus-derived technical and operations standards for OOS and RPO.

CONFERS will be open to participation by private sector stakeholders in the international satellite servicing community.

Currently, we are working with a small set of companies to develop the structure of the Consortium, and we hope to launch it in the next couple of months. We'll then be working with experts from industry and government to develop an initial standard for cooperative rendezvous and proximity operations.

bweeden@swfound.org

<https://www.linkedin.com/in/brianweeden>