



State of Space 2020
Remarks by Tom Zelibor, CEO
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[As prepared for delivery]

There has never been a better time to be in the space community. Even though we just celebrated the 50th anniversary of Apollo 11 last summer, the next 50 years will be even more exciting and transformational for all of us.

The same excitement I felt as a 15-year-old sitting on my parents living room floor watching Neil and Buzz making history is back again. So, we should ask ourselves, what will be different this time?

- This is not just a US government endeavor...it will encompass all aspects of our space ecosystem.
- It will not be a group of scientists and engineers that look like me...it will be a diverse, multi-racial, all gender, multi-generational team all dedicated to a common mission.
- It will not be the East vs. West space race between two superpowers...it will be a worldwide endeavor that brings the best and the brightest talent of all nations to make the next great human adventure to space even better than the last.
- Finally, it will have a heavy component of public-private partnerships to leverage the best we all have to offer.

So, what were some of the exciting events that took place in 2019?

1. Creation of Space Force (December)
2. Vice President Pence announced the goal of NASA returning to the Moon by 2024; Project Artemis was announced and kicked off. (March)

3. Virgin Galactic IPO is offered (October) – creating market value of over \$2 billion
4. SpaceX's Crewed Dragon vehicle made its first test flight to the ISS (March) – Mission Success
5. India and Israel both made attempts at landing vehicles on the Moon (Israel, April / India, July) – Both reached the Moon, but landings were not successful.

The list of things in 2019 that changed the world also included detecting the first recorded Mars Quake; the start of Christina Koch's record-breaking mission – including the first of its kind all woman spacewalks with her friend and fellow NASA astronaut, Jessica Meir; and other breakthroughs from SpaceX, ULA, and others.

There are many more accomplishments, but you get the point, the space community and in particular its economy is booming and is front and center in the dialogue of our national and international discourse. How do I define “booming?”

- A decade ago, the space economy was \$175BB.
- Today, it is nearly \$415BB.
- In the next two decades, it will climb to a trillion dollars.

To provide some metrics on this investment, I want to share with you a new way to take a look at the Global Space Economy through a very simple mechanism. We call it the Space Economy Scorecard, and it helps reveal where we're at and we're going. [*Space Economy Scorecard is displayed on screen and is shared with the audience.*]

- ✓ *Number of Nations Operating in Space – 81*
- ✓ *Number of People Employed in the Space Economy (2017) – 1 million*
- ✓ *Size of the Space Economy (Q2 2018) - \$414.75B*
- ✓ *Value of Commercial Space Products and Services: \$229.17B (2018)*
- ✓ *Number of Spaceports (2018) – 40 + 10 in development*
- ✓ *Economic Impact of GPS (Since 1983) - \$1.35T*
- ✓ *Increase in Number of Spacecraft in Space Between 2018 and 2019: +7.2%*
- ✓ *Space-Related Patents (2018) – Quadrupled over 20 years*
- ✓ *Global Government Spending on Space Programs (2018) - \$85.55B*
- ✓ *STEM Employment in 2028 - 10.56M*

Like any sport or business, metrics tell you how you're performing. Of course, with all this good news, there needs to be a healthy dose of reality applied to many of these areas. A few examples are:

Number of Nations Operating in Space – 81: While on the surface this may seem great for the space economy, but it also presents challenges such as: contested access to space capabilities, space debris and cleanup, space traffic management, policy issues, who “owns” what in space, who claims mineral rights, etc.

Number of People Employed in the Space Economy (2017) – 1 million:

Fantastic...now what? The STEM related job growth is expected to grow to nearly 11million by 2028. The problem is that our Universities are only graduating 15% of the requirement. As a result, we will not have the workforce available for this growth, and more importantly, we will have a massive shortfall of a security clearance capable workforce for NSS (national security space) positions.

We need to develop a sustainable workforce and a culture of innovation. That will not happen without a concerted effort of life-long learning. In the coming weeks, you will be hearing from the Space Foundation on cooperative strategies and initiatives on how we can best address our future workforce needs for innovation and education.

Economic Impact of GPS (Since 1983) - \$1.35T: Yes, an amazing number for sure, but you can bet our adversaries are targeting this system. With every financial transaction tied to GPS as well as many other essential activities, space is truly a critical infrastructure that deserves the undivided attention of our government and industry partners. That is why the importance of entities like the Space ISAC (Information Sharing and Analysis Center) are so critical to ensuring our secure access to space capabilities.

I'll close with a story about Space Awareness, one of the three pillars in the Space Foundation's strategic plan. About three months ago, I was giving a speech to about 200 CEOs and other heads of the largest non-profits in the country. I was asked to speak about the current activities in space; the investment going into it and what it means to our country.

About halfway through the talk, I noticed a gentleman in one of the front tables nearest to me really staring me down and looking more and more uncomfortable, the more I spoke. It was clear that he really had something he wanted to say. After I finished, I asked if there were any questions I could answer for the audience. His hand immediately went up. When I called on him, he asked, “How

we could justify spending billions and billions of dollars on space when there were millions of children starving on earth and our money could be put to better use there.” I immediately realized two things. First, with my fiery personality, I needed to count to ten...very slowly...and second, I now realized what his foundation supported as their mission!

I then asked, *“Do you know how much space technology contributes to help us solve problems here on Earth?”* He shook his head no. I then proceeded to describe how the research and development we are currently conducting to support life on other planets could solve the very problems he sees on earth and in a meaningful and sustainable way, vice one meal at a time. Research on advanced farming techniques in austere environments; creating water from minerals, compounds or gasses found on the Red Planet; telemedicine; 3D printing and many other technologies to serve the needs there...could be used here.

The conversation went on, but it became clear that he hadn't put those pieces together before. I am not sure I totally convinced him, but the point is, as a community, we need to do a better job of promoting the benefits of space and space exploration. It is in all of our best interests – best of all, it makes Space a place for all.

Thank you all for your attention and we'll now kick off our panel discussions.