Aligning U.S. Policies, Programs, and Budgets in Space

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I'd like to talk today about where we are today in the U.S. space enterprise, and where we can go. But to do so requires aligning our policies, programs and budgets.

We're all familiar with institutional stovepipes – cylinders of excellence. These also occur in how we create policies, design programs, and allocate budgets. People working on these areas may see results that make sense to them or reflect necessary constraints, but they don't see that the separate productions are not aligned with each other. We don't do what we say, or we don't fund what we say are priorities.

Strategic decisions a can be found at points of disconnection between policies, programs, and budgets. Writing policy can seem easy. But implementing those writings requires matching ends, ways, and means which is the heart of any strategy. In short, working to align policy, with programs, and budgets.

It takes a major effort, top down, to drive alignment as many institutions and individuals would rather be left alone, even with bad outcomes. This is difficult enough in a single agency, but even more challenging when working across civil, military, intelligence, and commercial space sectors. Each represents distinct cultures, yet together they make up national space power.

Let me start with a possible elephant in the room – where is the National Space Council?
I think a National Space Council would be a useful tool for the President to ensure his priorities are implemented. But there is nothing in the Constitution that requires it. A President has to want it and use it for it to be useful.

There are other ways of organizing for national space policy, such as the Senior Interagency Group for Space in the Reagan Administration, or combinations of NSC and OSTP staffers as done in the Clinton, Bush 43, and Obama Administrations. A major challenge as present is the drastic downsizing of the NSC staff, perhaps overdue, but leaving uncertainty. Another challenge is the confirmation of important appointees, notably at NASA, but also at Defense, State, and Commerce.

That said, I don't believe there are major policy issues to be solved. There are important open issues to be sure, but the policies of the first Trump Administration and the general bipartisan

support they received in the Biden Administration are a sufficient foundation. The real challenges are in matching means and ends, programs and budgets, to achieve those policies.

Despite the lack of Space Council there has been a lot of space activity in the past 10 months. A brief stock taking of where we are and the most pressing issues for the U.S. space enterprise.

To date:

- The Artemis Program of the Moon, then Mars continues
    - In the PBR, exploration is prioritized
    - Congress also wants to continue funding for science.
- Space Force continues and has even greater visibility and priority
- Golden Dome is new, and looking to threats in addition to missiles
    - FOBS, cruise missiles, hypersonic glide vehicle
- An Executive Order on commercial space
    - Elevating the Office of Space Commerce,
    - Speeding launch licenses and permits for commercial spaceport infrastructure
    - Authorization for innovative space activities not covered by existing regulations
- Support for Space Situational Awareness, SPD-3
    - Bipartisan and industry interest in the importance of SSA
    - Not so much for TraCSS, an issue for DOC
- Continued support for commercial nuclear power, including Space Nuclear Power
    - NASA statement on fission surface power, 100 kW
- Reset on the commercial LEO development program
    - Continuing use of Space Act Agreement, delays of services buys
- Downsizing NASA staff, including HQ

My primary concern that we are not “connecting the dots” on China, across civil, commercial, diplomatic, and military aspects. That is, we are failing to take a whole-of-government approach to shaping the space domain in our strategic favor.

We are failing to align policy, programs, and budgets for the geopolitical reality we face

- Recognizing a globalized and democratized domain does make you a globalist
- America First does not mean and should not mean America Alone

We need to move beyond images of flags and footprints, beyond the heroic, but limited von Braun paradigm

- build infrastructure to dominate cis-lunar space
- seek to expand the human sphere of influence, with the values of the United States, the West, and all heirs of the Enlightenment

I personally would like to see a $32 billion budget for NASA, which represents the same buying power as the agency had at the end of the Cold War in 1992. However, to earn that level of support, NASA would need to be advancing U.S. geopolitical interests and transform itself to be more innovative, and mission-driven, rather than institution driven. This NASA would have unique roles and missions, but complementary to the national security enterprise, and in partnership with U.S. industry.

In short, we need a space enterprise, not just a program, worthy of a great nation.

In 2017, the first Trump Administration issued a visionary statement on U.S. space exploration goals. Space Policy Directive 1 said that the United States would:

> "Lead an innovative and sustainable program of exploration with commercial and international partners to **enable human expansion across the solar system** and to bring back to Earth new knowledge and opportunities."

America's Manifest Destiny in Space

There are at least five big things that the second Trump Administration could accomplish to cement America's Manifest Destiny in space. These goals are focused on building the infrastructure for sustained American dominance in space, not just singular missions that don't permanently expand American presence, values, and power. The fundamentals of space infrastructure include transportation, facilities, communications, power, and resources.

Transportation

- *Buy commercial heavy-lift services* from at least two providers and phase out use of the Space Launch System after launch of the two vehicles now under construction. Assemble lunar cargo and landing missions in Earth orbit as necessary versus using a single rocket. Privatize the NASA Wallops Flight Facility and Kennedy Space Center.

Facilities

- *Lease private space stations* in Earth orbit by 2028 to support phase out of the International Space Station. Ensure a sustainable American presence in Earth orbit.

Communications

- Incentivize and lease lunar communication and navigation services from commercial providers before 2030. Government and private systems should use standards and technologies that will *enable a Solar System Internet*.

Power

- Operate one or more privately owned *nuclear reactors on the Moon* before 2030. Use of commercial, small modular reactors for nuclear electric propulsion in-space.

Resources

- *Purchase lunar water ice* from a commercial firm for use on the Moon. Demonstrate the commercial acquisition and return to Earth of rare earth materials from an asteroid.

A common principle for all these goals is that NASA should be buying services to achieve its assigned missions and not creating self-sustaining institutions. The United States needs to ensure dissimilar redundancy for critical space infrastructure and to not be dependent on monopolies, whether public or private. In order to dominate space exploration and development, the United States needs to ensure industry can provide sustainable, and frequent access.

Each of the big goals require advances in dual-use technologies that will benefit national security space activities. To this end, the United States should ensure that civil, commercial, and national security space sectors are led and integrated so as to maximize national power. The government should remain focused on its unique roles in national defense, public safety, fostering economic growth, and supporting scientific research and technologies too risky for the private sector. To the maximum extent practicable, routine and recurring space operations and facilities should be privatized.

A Historical Precedent

The United States landed on the Moon over 55 years ago, but today we are at risk of seeing Chinese astronauts on the Moon before we're able to return. But more than being first, we need to have a sustainable lunar presence – sustainable technically, economically, and politically. Norway was the first to reach the South Pole, but today it is the United States that puts some 3,000 persons "on the ice" each year. Through its presence, the United States shapes and guides the Antarctic Treaty System for that remote continent today.

When the Pacific Railroad Act was passed in 1862, in the middle of the American Civil War, California had only been a US territory for a little over a decade. Americans loyal to the Union were by no means the majority of the population and no regular troops were present. British forces were stationed in British Columbia, Russian forces in Alaska, French forces in Mexico, and Confederate forces in Tucson were all closer in distance and travel time than any Union regulars. The project was a high technological risk. No railroad of that length had been built anywhere or had climbed mountains as high as the Rockies. There was no obvious source of useful freight or

passengers for the greater part of the distance, except for a few Army forts. Aside from gold and silver, there were no obvious products in California that could provide freight revenues back to the East Coast.

To raise funds, the Pacific Railroad Act provided subsidies in the form of a fixed sum per mile of track laid, and land grants in the form of alternate squares of land, checkerboard style, along the route. The subsidies to the railroad companies provided working capital, and the land grants gave investors the prospect of a large eventual profit. The land along the Pacific Railroad route had almost zero dollar value before the railroad, while most of it gained far more value once it had transportation. The railroad and its shareholders never really got rich from freight tariffs and passenger fares. However, they got very rich from the sale of land grants once the areas became populated, and from all the other economic activity the railroads stimulated.

In the near-term, lunar settlements might be similar to Antarctic research stations. In the longer term, those settlements and those on Mars have the potential to be entirely new communities much as the Great American Desert was transformed by the coming of the railroad. While there are massive technical, economic, and biological uncertainties, the vision of becoming a multi-planetary species is certainly an exciting one. The goal of "Mars" is not just a race but can be thought of as a shorthand term for much bigger, indefinite objectives for America's future.

Let me close with the 2020 report from the National Space Council, "A New Era for Deep Space Exploration and Settlement," describes the vision and motivation for the space policies approved in the first Trump Administration.

> "The long-term policy of sustainable space exploration and development depends on alignment with enduring national interests such as security, economic growth, scientific advancement, and a stable international environment. … Establishing U.S. capabilities to operate routinely in cis-lunar space and beyond will deliver strategic assets not only for ourselves, but for all like-minded nations who share our values – liberty, democracy, the rule of law, and free market economic principles.
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> … Space exploration and development are not confined to one-time missions or any single destination. Rather, the effort described here is one of continually expanding human activity beyond the Earth. Close to home, the United States will encourage commercial activities to lower the public burden of maintaining and enhancing space capabilities. As the United States journeys into deep space again, it will do so with commercial and international partners as they are willing to participate and capable of participating. At the frontiers of exploration, the United States will continue to lead, as it has always done, in space. If humanity does have a future in space, it should be one in which space is the home of free people."