

April 4, 2017

The Honorable Brian Babin  
United States Representative  
Chairman, House Science Subcommittee on Space  
Washington, DC 20515

The Honorable Ami Bera  
United States Representative  
Ranking Member, House Science Subcommittee on Space  
Washington, DC 20515

Dear Chairman Babin and Ranking Member Bera:

Thank you for the opportunity to testify on March 8 at the hearing “Regulating Space: Innovation, Liberty, and International Obligations.” I’m happy to provide answers to the post-hearing questions you posed in your letter of March 23, 2017.

**1. a) What means do you recommend Congress use to determine that a nongovernmental operation would not initially or in the future cause tangible harm? What is an example of what you would consider to “cause tangible harm to other parties?”**

My proposal is not that Congress make an ex ante determination with regard to whether a nongovernmental operation will cause tangible harm. Rather, I propose that nongovernmental operations be presumed legal unless they cause tangible harm.

This is simply a continuation of the status quo. Today, excepting launch, reentry, and activities that affect radio spectrum, there is no regulator that provides prior approval for activities in space. To my mind, nobody has convincingly made the case that this status quo does not strike the appropriate balance between safety concerns and innovation. The justification for a potential authorization framework, rather, has been that one is necessary to comply with the Outer Space Treaty. My proposed blanket authorization framework perpetuates the substance of the status quo while addressing those treaty compliance concerns.

I would consider tangible harm to encompass any loss of life or limb in space, or any damage to property, such as that caused by a conjunction. Should such a harm occur, the aggrieved party, whether domestic or foreign, could sue in US courts. Under my framework, there would be no legal defense available that the US government authorized the operation, since the US government would not authorize harmful activity.

**1. b) Mr. Loverro stated in his prepared testimony that few, if any, individual operators have either the ability to assess the risk their activities may pose to other space flight missions or the resources or ability to ameliorate the damages their actions might have on those**

**missions. How would Congress be able to do so for U.S. vehicles, as well as for the even more challenging question of whether foreign space vehicles could be harmed?**

Although few individual operators have the ability—on their own—to assess the risk their activities pose to other actors in space, it is simply not true that private actors working together would be unable to develop that capability. Indeed, some of them are already doing so through private organizations such as the Space Data Association, which provides space situational awareness to satellite operators.

More generally, there has been a growing consensus among political economists over the last decade that the “tragedy of the commons” problem is often overrated. The late Elinor Ostrom became the only woman to win the Nobel Prize in Economics for her research on how common pool resources can be governed from the bottom up, by communities of participants appropriating those resources.

Ostrom’s research spanned numerous kinds of common pool resources such as fisheries, forests, and irrigation systems around the world. While she was careful to emphasize that there are no panaceas, she developed a series of eight indicators for when bottom-up governance can work. Among these is that the self-determination of the community must be recognized by higher authorities.

Following Ostrom’s pathbreaking work, it would be wise for Congress to recognize attempts by the space industry to self-regulate. The Space Data Association is a prime example of such an attempt. As private solutions to the difficult problem of space situational awareness develop, Congress, and the US government more generally, could access the information produced by these initiatives as a customer or a peer.

Incidentally, the difficulty of developing a solution that scales to handle interaction with foreign space vehicles is a strong argument for bottom-up, industry-led solutions, rather than top-down, government-imposed regulation. The Space Data Association’s membership is already international, and as a consequence, it is already playing a role in ensuring that foreign nongovernmental operators are acting responsibly. This is something that new US regulations on missions in space would be unable to achieve.

I hope this additional information is helpful in the committee’s consideration of how to promote innovation in space while meeting our international obligations. Please feel free to contact me if I can provide any additional information.

Sincerely,

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