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Questions for the Record

Subcommittee on Communications and Technology Hearing

Liftoff: Unleashing Innovation in Satellite Communications Technologies

February 8, 2023, at 10:30 a.m., 2322 Rayburn House Office Building

The Honorable Earl L. “Buddy” Carter

When it comes to orbital debris management, there are numerous domestic and international jurisdictions. Is this difficult to navigate? How can this process be simplified?

The protection of the orbital operating environment to ensure the sustainability of space is a global problem which requires global participation. This is an opportunity for United States leadership to work with industry to develop standard practices around space situational awareness data, communication and deconfliction activities between operators, and how to reduce the creation of debris in orbit. As various U.S. Government agencies work independently to address orbital debris and space sustainability, there is an opportunity to closely collaborate on policy developments to avoid conflicting or duplicative regulation and then lead among their global peers to encourage adoption of U.S. standard practices.

From Planet’s perspective, there are four areas of top priority for further orbital debris initiatives. First, we need better modeling for the LEO atmospheric environment. Positional uncertainty remains a thorny problem for satellites operating in LEO. The margin of error for measuring the distance between two objects at risk of collision using existing models of the LEO environment can sometimes be as high as several kilometers when predicted even 24 hours in advance. Space operators need better atmospheric models and space situational data to reduce those positional uncertainties, weed out “false positive” conjunction alerts, and minimize the maneuver distances required in the event of potential collisions. National governments and international organizations should continue to encourage industry efforts to validate and standardize models and define best practices for their use while also investing in R&D in the area of astrodynamics modeling for the LEO environment.

Second, we need better data sharing among space operators. National governments and international organizations should take additional steps to encourage private operators to share best accuracy orbit ephemerides with other operators. Planet performs orbit determination on its own satellites from GPS and 2-way UHF ranging and provides this data publicly in various formats. Transparent sharing with other operators of orbit ephemerides and contact information for operational personnel processing conjunction data messages would reduce uncertainty around

active-on-active conjunctions. In addition, operators should also regularly communicate details of planned maneuvers, especially those initiated in response to conjunction alerts.

Third, we need better ground-based tracking assets. Better data on space objects and space debris monitoring information is critical to limiting the creation of additional debris. Planet suggests that national governments and international organizations consider supporting R&D into improved public and private ground-based optical and radar sensors that would provide more data with higher accuracy for object tracking and characterization.

Finally, Planet supports public-private sector partnerships to explore active debris removal (ADR) technologies. Although efforts in this area are still under development, governments around the world are partnering with the private sector to push ADR activities forward. Other national governments and international organizations should follow such examples and increase R&D and cooperative efforts around ADR. These efforts should include (1) creating a conducive legal and regulatory environment (including a reasonable liability framework); and (2) providing economic incentives that will promote industry participation. Given the right framework and appropriate incentives, industry-led ADR solutions will emerge.

The Honorable August Pfluger

Where can Congress be most supportive of the intersection of agriculture and space tech given the national security implications of both?

Congress has an opportunity to continue advancing the adoption and integration of space-based technology and data into decision making back here on Earth, including in the agricultural sector. Continued investments in research and development for the next generation of space-based sensors, the applications of those novel technologies across a wide range of industries, and the integration of multiple data sets into actionable insights will maintain U.S. leadership in both space technology and the utilization of that technology by U.S. farmers. Planet is working with NASA to provide access to our daily Planetscope imagery to federally funded scientists and researchers for scientific purposes, and we work with universities around the world to provide access to our data at reduced costs to enable new research. These researchers are identifying new ways to use space-based satellite imagery to understand what's happening around the world and improve life on Earth. This includes new research in agriculture practices, air and water quality, and forest health to name a few, and targeted R&D investments from Congress can accelerate these efforts across the industry.