

**Written Testimony of Karina Drees**  
**President, Commercial Spaceflight Federation**  
**For the U.S. Senate Committee on Commerce, Science, and Transportation**  
**Subcommittee on Space and Science**  
**Thursday, July 22, 2021**

Chair Cantwell, Chair Hickenlooper, Ranking Member Wicker, Ranking Member Lummis, and distinguished members of the Committee—thank you for inviting the Commercial Spaceflight Federation (CSF) to present our members’ views on space situational awareness and the importance of space safety to a sustainable future for the United States in orbit and beyond.

CSF is the leading national trade association for the commercial space industry, with more than 85 member companies and organizations across the United States. Founded in 2006, CSF is focused on fostering a sustainable and growing space economy that democratizes access to space and space capabilities for scientists, students, civilians, businesses and decision makers. CSF members are responsible creating tens of thousands of high-tech U.S. jobs driven by billions of dollars in private investment.

The U.S. commercial space industry is leading the world today, thanks in part to the public-private partnerships that this Committee has repeatedly supported over the years and continues to support. We are grateful for your ongoing commitment to expanding and maturing this important industry, which is a key element of U.S. technological leadership and global competitiveness.

As a result of private sector innovation, the U.S. is seeing a marked increase in both the number of launches from the United States and the number of satellites—which provide critical capabilities, including broadband internet, earth mapping and environmental monitoring, and many other important services—deployed to orbit. In this domain, our competition is, largely, China. With the U.S. now the center of both launch capability—leading the world in commercial launch market share—and the space services market, the importance of ensuring a global commitment to space safety and space sustainability has never been more important.

While much attention is paid to new commercial satellite systems and so-called satellite constellations, it is important to note that such systems are predictable and well-conceived. Indeed, the largest contributors of space debris to this point have been generated by derelict state-owned or non-commercial rockets, and through the testing of anti-satellite weapons—not from commercially-licensed launch vehicles or emerging commercial satellite systems. In this sense, satellite constellations are similar to cars on a dirty highway—it is important to find ways to clean up the highway and ensure it is clean, not simply regulate the cars that are passing over it. At the same time, U.S. satellite operators have a history of responsible on-orbit operations, and this model of U.S. operations needs to be adopted worldwide. I am pleased to be here today to outline these efforts and to provide our recommendations to the Committee.

**Space Situational Awareness**

Space Situational Awareness (SSA) represents the most pressing issue to address today, and access to accurate and timely tracking data is essential to ensuring continued safe operations in space for all users. The U.S. Space Force 18<sup>th</sup> Space Control Squadron (SPCS) does an outstanding job collecting data from

U.S. government and commercial sensors worldwide to track and catalogue over 26,000<sup>1</sup> objects. SPCS supports U.S. government spacecraft operations and publicly releases unclassified tracking data for spacecraft and debris as small as two inches in diameter<sup>2</sup>. SPCS also provides spacecraft operators, both foreign and domestic, with Conjunction Data Messages (CDMs), that indicate whether the probability of collision between two objects is greater than 10<sup>-4</sup>.<sup>3</sup>

To better align agency focus, the Space Force and independent technical authorities, including the National Academy of Public Administration, have recommended that SPCS transition unclassified SSA activities for non-U.S.-government users to a separate entity; specifically, the Department of Commerce (DOC). Space Policy Directive-3 (SPD-3) issued further guidance for this transition.

CSF fully endorses this recommendation, and acknowledges that this Committee has also long supported DOC assuming this mission. The SSA mission is separate and distinct from the regulatory activities performed by the Federal Aviation Administration (FAA), the Federal Communications Commission (FCC), and the National Oceanic and Atmospheric Administration (NOAA), and should be managed by a separate civilian agency. The Department has commenced on developing the Open Architecture Data Repository (OADR) to collect and integrate government and commercial data into a new database and widely distribute it to space users. This is a great first step. CSF has supported the Department of Commerce's efforts to establish a dynamic, flexible, and scalable approach to civilian SSA and STM, and we are eager for DOC to quickly transition from a study phase into an operational phase for this effort.

#### **Recommendations:**

- 1. The Department of Commerce should rapidly transition from a study phase into operations for the OADR system.** While it is important to develop a system that accurately and comprehensively ingests and distributes tracking data, additional delays to this effort could create additional uncertainty for both the U.S. government and commercial users. We encourage Congress to provide the necessary financial resources to the Office of Space Commerce to complete this mission.
- 2. In providing SSA data, the government must offer a free data tier, while also ensuring it is not competing with the private sector for more advanced analytical services.** This approach represents a commitment to space safety, while also providing commercial companies the opportunity to develop innovative tools that will advance our understanding of space operations.

#### **Space Traffic Management**

Distinct from SSA, Space Traffic Management (STM) encompasses the regulatory policies designed to ensure responsible behavior in space. Today, the FCC serves as the primary driver of these requirements for U.S.-licensed satellite systems. As with SSA, the NAPA report recommends that DOC assume the leading role with STM.

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<sup>1</sup> <https://www.spaceforce.mil/DesktopModules/ArticleCS/Print.aspx?PortalId=1&ModuleId=489&Article=2129325>

<sup>2</sup> [https://www.nasa.gov/mission\\_pages/station/news/orbital\\_debris.html](https://www.nasa.gov/mission_pages/station/news/orbital_debris.html)

<sup>3</sup>that have (i) a time of closest approach within 72 hours, (ii) a probability of collision greater than 1/10,000 (1e-4), and (iii) a miss distance less than 1 km. [https://licensing.fcc.gov/myibfs/download.do?attachment\\_key=6212177](https://licensing.fcc.gov/myibfs/download.do?attachment_key=6212177)

Importantly, as noted by the recent National Science Foundation JASON report, it would be prudent to restrict or apply significantly stronger requirements and scrutiny to large satellite systems, or constellations, operating above 600 km. This is because debris at this altitudes will remain in orbit for centuries or longer, and the risk associated with passive debris removal is much higher than with lower altitudes. While DOC is the appropriate agency to propagate and maintain a STM regime, it should consult with a technical authority such as NASA to develop the requirements to ensure they are grounded in reasonable engineering analysis and take into account different orbital regimes and risk assessments.

Any newly developed STM rules—which can only come once a full SSA approach is implemented—must continue to both encourage safe operations and rapid innovation. This balance is critical as other countries, primarily China, plan to deploy thousands of satellites to space in the coming years and routinely demonstrate a lack of concern for space sustainability. Overly restrictive STM rules in the U.S. would serve only to hurt U.S. commercial competitiveness and national security, while both literally and figuratively leaving space for China to fill. Satellite systems will simply “forum shop” to license in foreign administrations without such rules in order to evade U.S. regulations, as has historically been the case with most satellite operators.

Indeed, any new U.S. regulations on orbital debris will be undercut by foreign-licensed systems that serve the U.S. market but are not required to abide by FCC or other U.S. Government orbital debris rules. As it stands, U.S. licensed systems must adhere to these regulations, but foreign licensed systems that seek and obtain U.S. market access do not. This regulatory asymmetry perversely incentivizes satellite operators to “forum shop” for countries with more lenient orbital debris requirements, as nearly all satellite operators have done. While U.S.-licensed companies are required to provide data on the health of their satellite systems, foreign-licensed systems operating in the U.S. are not—leaving an incomplete picture of orbital operations, and reducing transparency. This regulatory gap both reduces the efficacy of any current or future U.S. orbital debris mitigation policies and provides a preference for foreign systems over domestic systems.

If the Congress wishes to take any effective action on this matter, it must eliminate this regulatory asymmetry. Otherwise, the U.S. will never lead in space safety regulations worldwide. As the largest consumer of commercial space data in the world, the United States remains in a unique position to dictate reasonable STM and orbital debris standards, but only if it applies those requirements equally to all companies seeking to serve the domestic market.

#### **Recommendations:**

1. **FCC should modify its rules to require that any company that serves the U.S. market must comply with U.S. orbital debris rules.** This requirement would significantly improve global orbital debris activities, while leveling the playing field for companies licensed in the United States.
2. **DOC should partner with NASA to leverage NASA’s technical expertise in developing more effective technical standards.** NASA has deep institutional knowledge on safe space operations, through its Orbital Debris Program Office (ODPO) and Conjunction Assessment and Risk Analysis (CARA) program office that would benefit the Department.

## Appendix A

### The Commercial Spaceflight Federation's (CSF) FY 2022 Commerce, Justice, & Science Appropriations Priority Requests

**Agency: Department of Commerce**

**Account: National Environmental Satellite, Data and Information Service, ORF  
Office of Space Commerce**

FY22 CSF Request: \$49M<sup>4</sup> | FY21 Enacted: \$10M | FY22 PBR: \$10M

**Justification:** Space commerce and commercial space applications are experiencing rapid transformation and growth. The Department of Commerce, through the Office of Space Commerce, has the opportunity to further these trends, promoting growth through the expansion of the space economy. OSC can also be at the forefront of sustained US leadership in best practices for operating in space. It is critical that balanced investments occur in space sustainability in order to protect the operational environment. Commercial services exist, which the Office can lean on to protect investments in space by both the government and commercial entities.

**Requested Report Language:** *The recommendation includes \$49,000,000 for the Office of Space Commerce, in order to provide appropriate resources for the office's mission to promote the American space industry as well as fund the Space Traffic Management Pilot Program, which a Congressionally-directed NAPA study determined the office as the appropriate entity to manage this initiative. At least \$20,000,000 of the recommendation shall be used to purchase commercially-available space situational awareness data and services from the U.S. private sector. We further recommend that OSC avoid paying FFRDCs to develop redundant capabilities already available from the commercial sector.*

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<sup>4</sup> The \$49M top line number, and \$20M for SSA data and service buys, are derived from the NAPA study's budget runout for OSC for FY2022.

## Appendix B

### More details on some of the benefits the commercial space industry bring to the American people:

- **Climate change is an existential threat to our way of life and the commercial space industry is playing a critical role in addressing this crisis effectively.** The commercial space industry is helping tackle the Satellites in space are essential to successfully confronting the challenges we face from climate change. Spacecraft built and launched by America's commercial industry provide remote sensing data that allow scientists to better understand our changing planet and enable informed climate-related decision making by governments, industries, and individuals around the world.<sup>5</sup> To learn more details about how the commercial space is stepping up, please see the link in the associated footnote below.
- **The commercial space industry is combining innovation, private capital, and meaningful competition to lower the cost and increase the access to high-speed broadband internet for tens of millions of Americans living in underserved areas.**<sup>6</sup> To learn more details about how the commercial space is stepping up, please see the link in the associated footnote below.
- **The commercial space industry is advancing science through human-tended experiments on commercial vehicles.** Experiments that explore novel physical and chemical phenomena in weightlessness; explore astronomical events; develop instrumentation; study biological adaptation to spaceflight; develop medical procedures and equipment for future long-duration spaceflight; and make observations in the mesosphere and lower thermosphere will deliver superior science with an expert human performing the experiment in the spacecraft. While automation will suffice for selected experiments, the time is now to ensure we achieve the best science in the best manner possible. Human-tended suborbital experiments flying with the new commercial reusable suborbital spaceflight industry are now possible and are vital to best advance science and technology.<sup>7</sup> To learn more details about how the commercial space is stepping up, please see the link in the associated footnote below.
- **The commercial space industry is providing unprecedented access to hands on STEM education opportunities for K-12 students.** How a 2nd-Grade Class Sent a Science Experiment to Space. "Any school district now that affords football can afford spaceflight."<sup>8</sup> To learn more details about how the commercial space is stepping up, please see the link in the associated footnote below.
- **America's space enterprise is currently undergoing a renaissance space, led by the commercial space industry.** Over the past decade, U.S. commercial space companies have raised \$24.1 billion in private equity that has radically increased access to space, enabled distributed networks of small satellites, and laid the foundation for emerging new industries in low Earth orbit, including commercial space stations and free-flyers, and in-space manufacturing.<sup>9</sup> Even as the rest of the economy struggled financially during the pandemic, commercial space companies remained one of the few bright spots for the U.S. economy in 2020 and 2021. To learn more

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<sup>5</sup><https://thehill.com/opinion/energy-environment/540686-space-is-critical-to-climate-if-you-cant-measure-it-you-cant>

<sup>6</sup><https://www.orlandosentinel.com/opinion/guest-commentary/os-op-broadband-internet-20190725-xdqcejglzvcoflsfja5ii7jz34-story.html>

<sup>7</sup> <https://spacenews.com/op-ed-advancing-science-through-human-tended-suborbital-experiments-on-commercial-vehicles/>

<sup>8</sup> <https://www.nytimes.com/2020/10/13/science/blue-origin-school-experiment.html>

<sup>9</sup><https://spacecapital.docsend.com/view/v7n5255rnz3hm743>.

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