



Testimony of Mr. David Cavossa
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House Committee on Science, Space, and Technology
Space and Aeronautics Subcommittee
“The Future of Low Earth Orbit: From the ISS to Commercial Platforms”
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Introduction

Chairman Babin, Chairman Haridopolos, Ranking Member Lofgren, Ranking Member Foushee and distinguished members of the committee, thank you for inviting me to testify on behalf of the Commercial Space Federation (CSF).

CSF is the leading trade association representing the commercial space industry. Our members represent multiple sectors of the space economy including commercial space stations, in-space research and manufacturing, launch and reentry, and in-space transportation. CSF and its members are focused on expanding America’s leadership in space by offering innovative and less expensive solutions to U.S. government customers including the National Aeronautics and Space Administration (NASA), the U.S. Space Force, and the intelligence community. In addition, CSF advocates for policies that will provide services to the American public and grow a sustainable space economy, the global value of which is already estimated at \$570 billion¹ and projected to grow to \$1.8 trillion by 2035.² The commercial space industry has created tens of thousands of high-paying engineering and manufacturing jobs in the United States and has invested billions of dollars across the country, revitalizing a domestic aerospace supply chain that had been in decline and unlocking new potential in space that will benefit us on Earth.

Building the LEO Economy

In 2005, Congress directed the establishment of the International Space Station (ISS) National Laboratory to open ISS to non-NASA researchers and private companies. In 2010, a private company called Nanoracks installed the first commercial laboratory on the ISS, enabling universities and companies to conduct microgravity research experiments. That same year, Congress required NASA to dedicate at least 50% of the U.S. research capacity on the station to non-NASA users through the ISS National Laboratory.

¹ <https://www.spacefoundation.org/2024/07/18/the-space-report-2024-q2/>

² <https://www.mckinsey.com/industries/aerospace-and-defense/our-insights/space-the-1-point-8-trillion-dollar-opportunity-for-global-economic-growth>



Since then, private and non-NASA research on ISS has steadily grown. Since 2012 and through FY 2025, the ISS National Lab has supported flights for 899 payloads, 75% of which have been commercial. Interestingly, ISS National Lab is tracking \$2.7 billion in private funding raised by start-up companies since their flight to station. Demand for access to station is high and the lab is carrying a backlog of 163 payloads awaiting flight. If demand and transportation capacity holds steady, ISS National Lab space will be full booked through the end of 2030 in about 12 months.

The unique microgravity environment offers an ideal setting for development and manufacturing across a range of industries, including pharmaceuticals, biotechnology, semiconductors, and advanced materials. For example, in 2023, astronauts aboard the space station successfully bioprinted a human knee meniscus cartilage using the BioFabrication Facility developed by Redwire. On Earth, gravity often causes soft biological materials to collapse during printing, but in microgravity, tissues can retain their shape more easily, enabling scientists to create thicker and more complex structures. The same microgravity principles apply to non-biological materials, such as those used in advanced semiconductor manufacturing. Additionally, companies like Varda are providing platforms for microgravity research beyond the ISS, as do companies with returnable upper stage vehicles like Stoke Space, paving the way for in-orbit manufacturing of pharmaceuticals and advanced materials.

Commercial Partnerships in LEO

When NASA decided to retire the space shuttle in 2004, the agency still needed the capability to transport astronauts, research experiments, and supplies to the ISS from U.S. soil. Instead of building a bespoke government-owned transportation system for LEO, NASA implemented a new acquisition model in which the government would buy commercial transportation services from industry at a fraction of the cost of developing, owning, and operating its own system. The commercial orbital transportation services (COTS) program and successive Commercial Crew and Cargo programs have been quite successful. Fifty-six U.S. and international partner astronauts have now ridden to space on a commercial rocket. There have been more than 50 commercial resupply missions to the ISS. This model proved that under firm-fixed price partnerships with industry, NASA can do more – explore more – by maximizing the efficiency of resources granted by Congress.

While ISS is an incredible feat of engineering, the station is 25 years old and starting to show signs of wear. However, NASA still needs to conduct research and crewed flight operations in LEO. Building upon the success of commercial LEO transportation, NASA plans to move its ISS activities to one or more commercially developed and operated space stations upon the retirement of the ISS, currently planned for 2030. These stations are being developed by



multiple U.S. companies under Phase 1 of NASA’s Commercial LEO Development (CLD) program, which awarded a series of funded and unfunded agreements to help industry mature early station concepts and reduce technical risk before NASA solicited for CLD services.

Following Phase I, NASA planned to initiate a full and open competition for CLD services in 2025. However, on July 31, 2025, acting NASA Administrator Sean Duffy released a directive indicating that NASA was altering the procurement strategy and timeline for the CLD program.³ Among other changes, the directive said that NASA would fund an additional round of Space Act Agreements, similar to those previously awarded in Phase 1, to support U.S industry’s design and demonstration of CLDs in advance of the competition to certify a CLD and procure services. NASA followed this in September with a draft Announcement for Partnership Proposals for the next phase of the CLD competition.

NASA’s revectoring and shifting demand signals are having a ripple effect on both industry and the investment community—each of which is essential to fielding CLDs that will enable NASA to continue its mission after the ISS and to realize its goal of being one of many customers on a CLD.

Recommendations

CSF applauds this committee for its focus on maintaining U.S. leadership in space. As the committee considers policies and oversight of NASA’s plans in LEO, CSF respectfully asks for consideration of the following recommendations.

Recommendation 1: Proceed with a CLD Procurement that Minimizes Requirements and “Stick to the Plan”

NASA should proceed with the CLD procurement and provide industry with certainty of its acquisition strategy, requirements, and procurement timeline. Given the delays and possible shifts in strategy, industry has been left to continue spending resources to develop private space stations without a full understanding of what NASA will require from a private station, how the agency will structure the rest of the procurement and program, and when industry may see a return on investment. This uncertainty challenges the public-private partnership business model and puts the agency at risk of deorbiting ISS before private stations are operational. Furthermore, NASA should carefully consider each requirement and be mindful that the goal of CLD isn’t to recreate the ISS.

³ <https://www.nasa.gov/wp-content/uploads/2025/08/nasa-cld-directive-aug-4-2025.pdf?emrc=35eca8>



Recommendation 2: Indemnification for NASA Partners

NASA and Congress must consider how to provide liability protections to its commercial partners in LEO. Under Article VII of the Outer Space Treaty and the Liability Convention, a launching State is liable for damage on Earth and in space caused by space objects launched from its sovereign territory. As NASA prepares to transition its LEO activities from the ISS to commercially owned and operated space stations, NASA has recognized the space insurance market – an estimated \$500-\$800 million in available capacity - may not be able to sufficiently protect the government’s investment in CLDs or provide adequate liability coverage.⁴ Furthermore, recent experience by our membership indicates that insurers are only extending a fraction of that capacity, at very high premium rates, and coverage is even more sparse for initial flights and deployments of novel, one-of-a-kind assets.

There is precedent for government indemnification of risky activities that cannot otherwise find adequate insurance on the market. For space activities, the 1988 Commercial Space Launch Amendments Act authorized indemnification for commercially licensed launch and reentry, and the NASA Transition Authorization Act of 2017 provided an indemnification framework for launch and reentry services carried out under contract with NASA. In recent years, NASA has utilized indemnification authority provided under P.L. 85-804 (codified in 50 U.S.C. 1431), which gives discretion to the Administrator to indemnify programs important for the “national defense”. Congress has also identified programs it considers to be important for the national defense to provide guidance to NASA to use this authority (e.g. Section 421(c)(2) of the NASA Transition Authorization Act of 2017). CSF recommends that NASA invoke P.L. 85-804 and consider, at the discretion of the Administration, providing some level of indemnification to CLD providers delivering services under contract with NASA.

Recommendation 3: Support Continuous Human Presence and LEO Research Activities

A robust commitment from NASA to utilize commercial stations and uncrewed platforms is critical to the success of commercial LEO operators and continued growth of the orbital economy. This includes careful planning to transition research activities from ISS and funding science and technology development programs like the In Space Production Applications (InSPA) program and research supported by the Biological and Physical Sciences (BPS) division, among others. Just as ISS National Lab manages non-NASA research activities on ISS, NASA and Congress should consider how such a function could be structured and funded after the retirement of ISS.

⁴ [Commercial LEO Destinations Asset and Liability Insurance: Findings and Options \(nasa.gov\)](https://www.nasa.gov/commercial-leo-destinations-asset-and-liability-insurance-findings-and-options)



When ISS deorbits, NASA and our international partners should continue a regular cadence of long-duration missions in LEO, ensuring the U.S. maintains continuous human presence in LEO. LEO is an important proving ground for U.S. crew and ground operators to retain the skills and knowledge to conduct long-term in-space operations, like those needed for crewed missions to the Moon and Mars.

Recommendation 4: Fully Utilize the ISS Through End of Life.

The third decade of the ISS is poised to be the most productive, driven by the availability of multiple commercial and international transportation systems and the growing utilization of the space station by private industry. As directed by this committee's NASA Reauthorization Act of 2026, NASA should maintain its regular U.S. crew contingent size and a cadence of not less than two crew rotation missions per year and five cargo missions per year while the ISS is operational. In addition, Congress should continue to provide funding for ISS and LEO research. Fully utilizing ISS through end-of-life will allow for continued growth of the LEO economy and development of commercial customers for future LEO platforms. CSF applauds Congress for adding resources for ISS in the One Big Beautiful Bill.

China's "Space Dream"

A final point about what is at stake in LEO. In 2022, China launched its Tiangong space station, a three-module station that has been continuously crewed since that time. Tiangong is outfitted with state-of-the-art research facilities, supporting similar research to that of the ISS in advanced materials and pharmaceuticals. China has announced plans to host an international crew member and is aggressively reaching out to international customers that might otherwise fly, conduct research and development, and commercialize technology on an American station. As in other infrastructure efforts, China uses space partnerships as a part of the Belt and Road Initiative to grow its international influence. China's stated objective is to be a world leader in space by 2050 and a key competitor with the U.S. in space, for decades to come.⁵ China is fully committed to achieving its "Space Dream" and will leverage all resources to achieve the goal of becoming a global leader in space.

Additional Recommendations

Commercial space activities are licensed and regulated by the Department of Transportation, the Department of Commerce, and the Federal Communications Commission. CSF submits the following recommendations outside of NASA for the committee's consideration. Several of these recommendations are addressed by President Trump's August 13 Executive

⁵ <https://www.voanews.com/a/china-space-plan-highlights-commitment-to-space-exploration-analysts-say/7836873.html>



Order “Enabling Competition in the Commercial Space Industry” which provided important direction to federal agencies to prioritize policies and oversight that will unleash the U.S. space economy.

- *Regulatory Reform* - The Department of Transportation and Federal Communications Commission should streamline the licensing process for space activities.
- *Mission Authorization* - The Department of Commerce should implement a voluntary process for authorization and supervision of non-governmental space activities not currently overseen by an existing regulatory regime, in order to give commercial operators – and their investors - certainty they have a pathway to flight operations.

Conclusion

The next few years are critical to ensuring an efficient transition from government-led activities in LEO to one in which the government is one of many customers. Private sector developments in LEO infrastructure, in-space research facilities, crew access, and cargo services will ensure the U.S. is poised to lead in the post-ISS era. However, a seamless transition is far from a guarantee and requires the government to clearly articulate its needs, backed up by resources, on a stable timeline. Thank you and I look forward to your questions.