

Low-Earth Orbit: NASA Faces Impending Decisions for Replacing International Space Station with Commercial Stations

GAO-26-107805

Q&A Report to the Chairman, Committee on Commerce, Science, and Transportation, U.S. Senate

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Why This Matters

For over 25 years, crews aboard the International Space Station (ISS) have contributed to scientific research and technology development not possible on Earth. U.S. policy, in a statute enacted in 2017, calls for an uninterrupted capability for human space flight and operations in low-Earth orbit (LEO) to ensure continued U. S. participation and leadership in space.¹ To continue to meet this policy, the National Aeronautics and Space Administration (NASA) plans to deorbit the ISS, a government-owned platform, by the end of 2030 and to transition to commercially owned and operated space stations. NASA's ultimate goal is to be one of many customers buying services from the commercial space station providers. In 2019, NASA created the Commercial LEO Development Program (CLDP) to work with commercial space station companies and to stimulate a commercial space economy.

You asked us to review issues related to NASA's plans to deorbit the ISS and transition from the ISS to commercial space stations. This report identifies upcoming key decision points for NASA leadership related to the transition, examines the implications of a potential gap in human presence in LEO, and discusses the potential impact to the viability of the commercial space economy. Further, we outline areas of uncertainty for NASA to consider as it executes its transition plans, including how many companies it will award contracts and agreements to and whether the commercial companies will be able to secure other customers to complete their business case.

Key Takeaways

- NASA is planning to retire and deorbit the ISS in 2030, and to replace it with one or more commercially owned and operated space stations.
- NASA has been working with six commercial companies to mature their initial space station designs. NASA plans to award one or more Space Act Agreements in 2026 to continue maturing the stations' designs until the companies can conduct an in-space crewed demonstration. As of May 2026, NASA is also exploring an alternative approach that is seeking to develop a new space station that will initially attach to the ISS and eventually detach and become its own station.
- NASA is concerned about having a gap in continuous human presence in LEO, but it has not yet assessed the likelihood or potential duration of a gap. Additionally, NASA officials explained that they have used a standard process to decide to extend ISS operations in the past, but they have not documented the assessment process. This includes documenting the factors—such as the key assumptions, risks, and uncertainties—that will be used to make the decision to deorbit the ISS in 2030 as planned, or extend operations again.

- We recommend that NASA (1) determine the likelihood and duration of a gap in continuous presence in LEO, including plans to mitigate the likelihood of a gap; and (2) document the process that it will use to make an informed decision on whether NASA will retire and deorbit the ISS as planned in 2030.

Why is NASA planning to develop the LEO economy and commercial space stations to replace the ISS?

In 2017, Congress directed NASA to plan for an orderly transition from an arrangement where NASA and other ISS users rely heavily on U.S. government funding to one where NASA is one of many customers of a LEO economy.² This transition includes supporting the development of commercial space stations from which NASA would buy services. In 2019, NASA published its initial plan that outlined how it planned to encourage and facilitate the growth of the U.S. commercial space sector in LEO.³ This plan included, among other things:

- Pursuing opportunities to stimulate sustainable demand for the LEO economy. This includes partnering with industry to develop one or more commercial stations that meet NASA's long-term needs and expanding U.S. industry's use of the ISS in several areas, such as in-space manufacturing.
- Establishing a commercial use and pricing policy to expand the scope of commercial activities undertaken on the ISS and allowing companies to fly private astronaut missions to the ISS.
- Developing commercial stations that start as a module that can attach to an ISS berthing port and that eventually detach to become a free-flying station, in addition to stations that start out as free-flying.

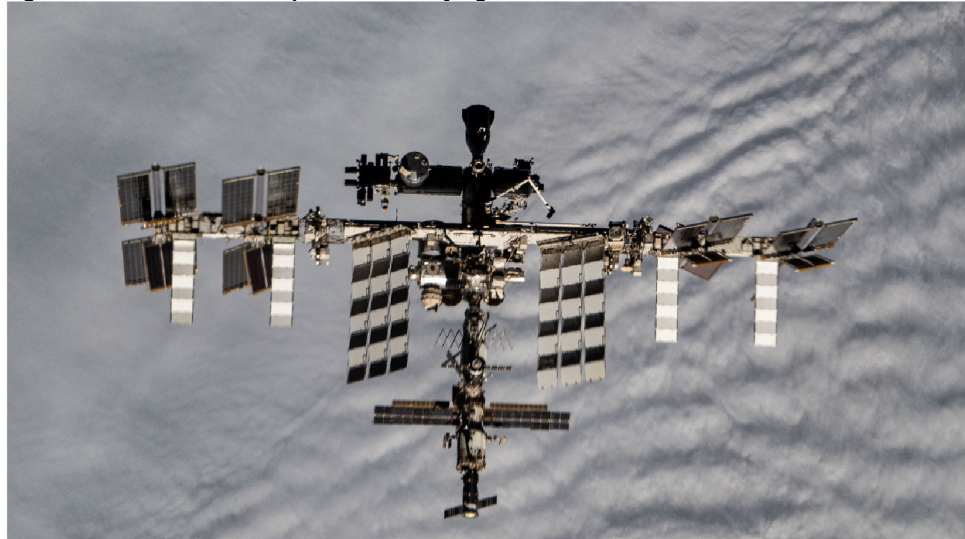
NASA does not intend to take ownership of the commercial stations. Instead, selected U.S. companies will design, build, own, and operate their own stations, related ground system control centers, and support infrastructure. NASA plans to certify the stations as safe for NASA crews' use and buy mission services on those stations. NASA expects that relying on commercial stations will drive down the costs for astronauts to conduct research and other activities in LEO and free up resources for NASA's other exploration objectives.

However, there have been changes to the acquisition strategy. For example, in August 2025, the Acting NASA Administrator signed a directive that changed the acquisition strategy to accelerate the move to using commercial space stations and within the planned budget profile. In March 2026, NASA announced a subsequent alternative acquisition approach that includes the possibility of awarding a contract to develop a government-owned station.

How much does it cost to maintain the ISS?

NASA spends approximately \$3 billion a year to maintain and operate the ISS (shown in fig. 1). This includes the costs of crew and cargo transportation to the station, which represents about 60 percent of the total cost. However, NASA officials indicated that costs will likely grow in subsequent years.

Figure 1: The International Space Station Flying Above South America



Source: NASA. | GAO-26-107805

How long can the ISS continue to operate?

NASA's latest structural health analyses, which looked at the ISS's primary structure, indicated a high level of confidence that ISS can operate through 2028. NASA officials said that they expect to complete another structural analysis in 2026 for the period beyond 2028. They said that they are also confident that the ISS's life can be extended through the late 2030s or 2040 time frame if needed. However, it may become more challenging to maintain and repair the ISS as it ages. The ISS is now operating well over the 15 years for which NASA and its international partners designed and tested it. A 2024 NASA Office of the Inspector General report found that as industry prepares for the retirement of the ISS, NASA might find it more difficult to acquire key parts required for continued operations as suppliers decrease or cease production.⁴

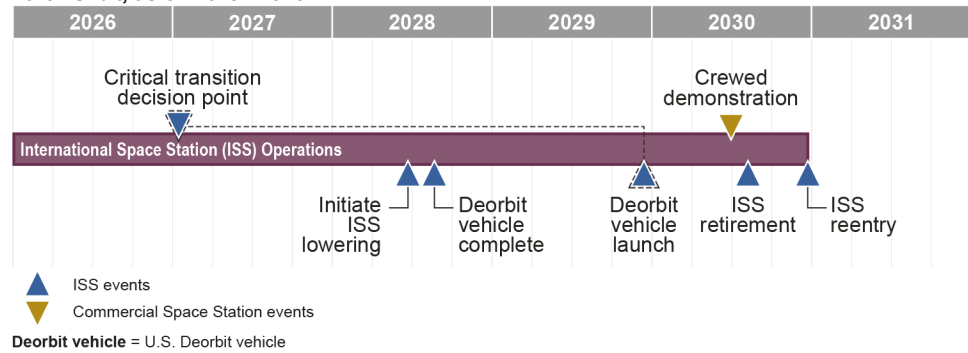
What is NASA's general plan for transitioning from using the ISS to commercial space stations?

As of May 2026, NASA's transition plan is in flux. The current plan aims to provide industry with a flexible approach to develop their commercial stations while minimizing the potential for a gap in a continuous presence in LEO. The plan prioritizes retiring and initiating the ISS deorbit in 2030 and aims for companies to demonstrate crewed commercial space stations no later than that same year to reduce the potential for a gap in crewed capability in LEO. As of March 2026, the general timeline for transition activities included:

- In 2027, NASA will assess whether to launch the U.S. Deorbit Vehicle in 2029 to initiate the ISS's deorbit or to extend ISS operations. The U.S. Deorbit Vehicle is comprised of a SpaceX Dragon spacecraft with docking and rendezvous capabilities and a Dragon trunk with propulsion capability. The vehicle is intended to help guide the ISS through the atmosphere in a controlled descent.
- Commercial stations will be required to conduct a crewed on-orbit demonstration of the minimum capability of four crew for 30-day missions as soon as possible, with NASA's target set for no later than 2030.
- In 2030, NASA plans to retire the ISS and conduct deorbit reentry maneuvers.

See figure 2 for a timeline of these key transition events.

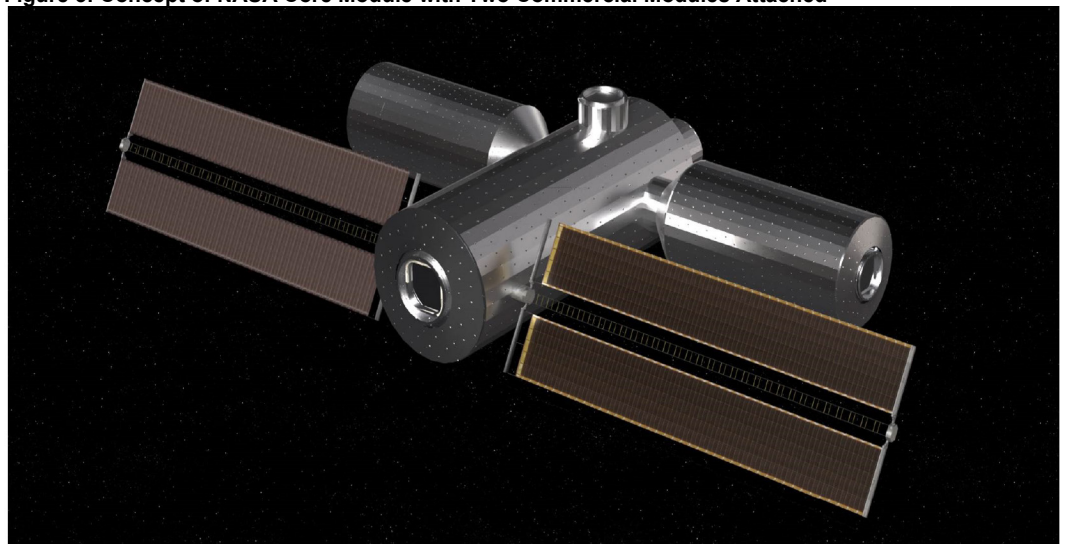
Figure 2: Timeline of Key Events in the Transition from Using the ISS to Commercial Stations in Low Earth Orbit, as of March 2026



Source: GAO analysis of NASA program documentation and interviews with program officials. | GAO-26-107805

However, in March 2026, NASA also announced a new request for information from industry to help inform potential changes to its plan due in part to affordability concerns. Specifically, NASA proposed an alternative approach for a new space station that leverages the ISS and its on-orbit resources, hardware, and transportation capabilities. The new space station would be formed using a government-owned Core Module, which can attach to the ISS or operate independently. The Core Module would include propulsion and initial power capabilities, communications and data handling, navigation and software, and basic crew habitation and thermal controls. The proposed approach would have the Core Module launch first and rendezvous with the ISS. Once the Core Module is installed, two commercial modules can launch and attach, as shown in figure 3.

Figure 3: Concept of NASA Core Module with Two Commercial Modules Attached



Source: NASA. | GAO-26-107805

The commercial modules would include research, habitable, and stowage spaces. They would also be able to store ISS transferred hardware. While attached, the ISS’s power and other resources would be available for the core and commercial modules. After detaching, the Core Module would become the Core Space Station. As such, the station would be a new NASA-owned, self-sufficient, free-flying platform. NASA also plans to develop a Power and Cooling Module to be added to the Core Space Station.

NASA officials indicated that they plan to evaluate which approach they are going to proceed with in the summer of 2026.

Who are the key stakeholders involved in the transition from the ISS to commercial stations?

NASA is coordinating with several NASA programs, companies, and international partners. Table 1 shows the roles and responsibilities of the various entities involved in transitioning from the ISS to commercial stations and maintaining a presence in LEO.

Table 1: NASA and External Partner Roles and Responsibilities in the Transition from the International Space Station (ISS) to Commercial Space Stations

Entity		Roles and responsibilities
NASA ^a	Commercial LEO Development Program (CLDP)	<ul style="list-style-type: none"> • Enable the design and development of commercial space stations where NASA is one of many customers. • Verify space station companies meet all NASA commercial low-Earth Orbit (LEO) requirements to certify that their stations are safe for use by NASA crews. • Jointly with Commercial Crew Program, ensure safety and well-being of NASA crew during launch, return, and integrated operations for missions when NASA is providing transportation services.
	International Space Station (ISS)	<ul style="list-style-type: none"> • Manage the operations, retirement, and deorbit of the ISS with international partners. • Manage the certification of cargo transportation.
	Commercial Crew Program	<ul style="list-style-type: none"> • Ensure safety and well-being of the NASA crew during mission launch and return, and joint responsibility with CLDP for integrated operations. • Manage certification of crew transportation vehicles for NASA crew.
External Partners	Commercial space station companies	<ul style="list-style-type: none"> • Design and develop commercial space stations in partnership with the CLDP. • Manage station launch, operations, and services. • Ensure safety of their station(s) and their crews across the entire mission during end-to-end services. • Coordinate with visiting vehicle companies to ensure safe delivery and return of crew.
	Visiting vehicle companies	<ul style="list-style-type: none"> • Coordinate with commercial space station companies to ensure safe delivery and return of crew. • Ensure safety of the vehicles.
	International partners	<ul style="list-style-type: none"> • For current ISS partners, support ISS maintenance and operations through final deorbit. • Serve as customers and/or service providers of commercial space stations and contribute to research.

Source: GAO analysis of NASA documentation. | GAO-26-107805

Note: Information in table reflects the roles and responsibilities as outlined in NASA's initial approach and the revised approach from the August 2025 Directive. These roles and responsibilities may change if NASA decides to pursue the March 2026 alternative approach that proposes a government-owned Core Module.

^aThe Space Operations Mission Directorate oversees the three NASA programs listed in the table. The mission directorate coordinates across the programs on the transition, budget, and transportation interdependencies.

NASA officials stated that the ISS international partners have confirmed commitment to helping maintain and operate the ISS until its retirement in 2030. Further, the officials stated that they are coordinating with their Russian State Space Corporation (Roscosmos) counterparts to solidify the level of operational support Roscosmos plans to provide through retirement and deorbit.

How does NASA plan to deorbit the ISS?

NASA will deorbit the ISS in a series of actions. NASA estimates that, in early to mid-2028, the ISS will start to be lowered through a combination of the Earth's natural atmospheric drag and the execution of re-entry maneuvers by the ISS's Russian segment. Then, in mid-2029, NASA plans to launch the U.S. Deorbit Vehicle and attach it to the ISS.⁵ Finally, at the end of 2030 or early 2031, the U.S. Deorbit Vehicle will perform a re-entry burn, which will push the ISS through the Earth's atmosphere and into the ocean. As part of the reentry process, NASA expects portions of the ISS and deorbit vehicle to break up and fall into the remote part of the ocean to minimize the risk to populated areas. Figure 4 is a notional illustration of the deorbit vehicle docked to the ISS.

Figure 4: The U.S. Deorbit Vehicle Docked to International Space Station



Source: © 2024 Space Exploration Technologies Corp. | GAO-26-107805

How is NASA working with companies to develop commercial space stations?

NASA is currently planning to use a three-phased approach to help companies develop commercial space stations, though it has not finalized its phase 2 or phase 3 acquisition approaches.

In Phase 1, which started in 2020 and is currently ongoing, NASA is working with these companies to mature their station designs to approximately a preliminary design review-level of maturity. Preliminary design reviews are held to demonstrate the design meets all system requirements and is ready to proceed to the next phase of development.⁶

During Phase 1, NASA has:

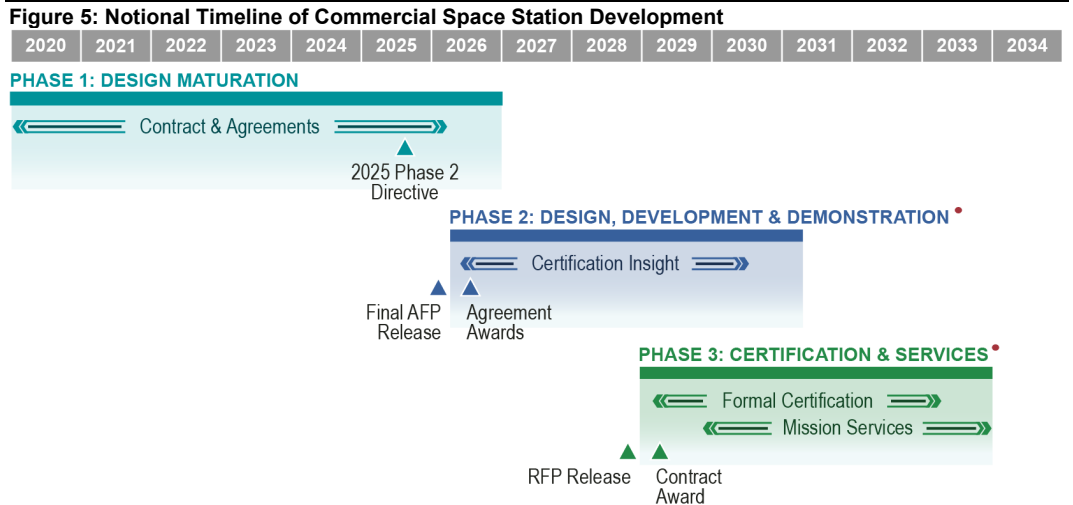
- **Awarded a contract and Space Act Agreements for early station designs.** In 2020 and 2021, respectively, NASA awarded one contract and three funded Space Act Agreements to commercial companies to support the development of their commercial space stations.⁷ The contract and funded Space Act Agreements provided the commercial companies with NASA technical assistance and nearly \$530 million in funding upon successful completion of agreed-upon milestones.⁸ In 2023, NASA awarded three companies unfunded Space Act Agreements to support the development of commercial space stations.⁹ Under these unfunded agreements, NASA provides commercial companies with NASA technical expertise, assessments, technologies, and data to support their development efforts.
- **Sought industry feedback to inform the commercial station acquisition requirements development.** NASA solicited feedback from industry to better inform requirements development. NASA has had multiple interactions with

industry, such as through industry days and technical meetings, to aid in the requirements to develop commercial stations.

- Drafted plans for certifying stations.** In December 2025, NASA finalized the CLDP System Certification Plan. This plan outlines the processes, events, and criteria associated with the development of the commercial systems, as well as the evidence needed to support NASA’s certification that the commercial space stations are safe for crew use. The CLDP is also developing additional certification guidance, such as the Certification Transition Framework.

While NASA intended to be in Phase 2 at this point, it has encountered several delays in finalizing and releasing its Phase 2 strategy. In September 2025, NASA released its draft announcement for proposals for Phase 2 of the strategy. According to the draft Announcement for Partnership Proposal for Phase 2, NASA intends to award one or more Space Act Agreements to continue the design and development of commercial space stations, including an in-space crewed demonstration of applicable crew transportation, utilization, and ground and mission systems. At the time NASA released the draft announcement, the agency had planned to release the final announcement for proposals in October 2025 and award the agreements in April 2026. However, the 2025 federal government shutdown and the confirmation of a new NASA Administrator delayed the release of the final announcement for proposals. The release will be further delayed as NASA reviews input on the alternative approach announced in March 2026.

The formal design acceptance, certification, and human rating will occur during phase 3. For the final phase, NASA is planning to have a full and open competition, which will permit non-Phase 2 companies to bid on the Phase 3 contract. See figure 5 for a notional timeline.



• Dates to be determined
 AFP = Announcement for proposals
 RFP = Request for proposals
 Note: Graphic is not to scale.
 Source: GAO analysis of NASA program documentation. | GAO-26-107805

NASA informed the commercial space companies that it anticipates approximately \$1 billion to \$1.5 billion over fiscal years 2026 through 2031 to be available for funding the agreements or contracts. NASA had expected this amount to be sufficient to fund two or more Space Act Agreements, but said that additional funding will be required for follow-on services. Additionally, NASA officials clarified in March 2026 that the amount available may only be sufficient to support one commercial space station. The companies selected are to obtain

from their own or other private sector sources any additional funding that is necessary to complete their work.

What companies are currently designing and developing commercial space stations?

There are six companies that are currently developing designs for their commercial space station. See Figure 6 for a list of the companies and a description of station concepts.

Figure 6: NASA's Description of Commercial Space Station Award Amounts and Concepts



Source: GAO analysis of of NASA documentation. | GAO-26-107805

All the companies are employing different designs for their space stations. For example, Starlab Space's planned commercial station consists of a large 8-meter diameter metallic habitat with a docking node, power and propulsion element, and external robotic arm, all of which the company plans to launch simultaneously into orbit. In contrast, Axiom Space will first attach its station module to the ISS and eventually detach to become a free-flying station.

How will the transition from ISS to commercial space stations affect NASA or other organizations' ability to conduct research in LEO?

NASA estimates an initial decrease in research capability compared with the ISS' current capability, depending on the number of stations certified and when they are launched. Currently on the ISS, NASA performs about 100 research investigations per 6-month mission increment, and the ISS National Laboratory performs an additional 100 investigations, according to officials.¹⁰ An ISS program official noted that it took time for NASA to build up all capabilities on ISS and that it is going take time to build capability up again on the commercial stations. Further, while the planned commercial stations may not be as large as ISS, NASA officials told us that they believe that the commercial stations will provide the capabilities that NASA will need in the future.

During commercial space station demonstration missions, the providers are to show how they would meet future NASA science objectives. In March 2026,

NASA officials indicated that they are exploring an alternative approach to develop a NASA-owned space station that commercial modules can connect to and use for research.

NASA officials said that, depending on budget availability, they intend to fully use the ISS until the last crew departs in 2030. While the ISS will continue to be open and available to conduct research, some research sponsors may opt for transitioning their research to the new commercial stations when a researcher's experiment requires a number of experimental runs that cannot be completed before the crew departs the ISS.

What are risks or scenarios that could result in a gap in a continuous presence in LEO, and how does NASA plan to address these?

Based on NASA documentation, there are four main risks that could lead to a gap in a continuous presence:

Ambitious schedule. NASA's expectations as to when commercial companies can build and launch commercial stations are optimistic. If the commercial space stations are not available before NASA deorbits the ISS in 2030, there will be a gap in continuous presence.

According to CLDP documentation, the Phase 1 companies are on track to demonstrate that their designs meet their companies' preliminary design requirements before NASA awards agreements for Phase 2.¹¹ However, whether these companies can meet the program's Phase 2 mandatory milestone of demonstrating a minimum on-orbit crewed capability by 2030 is uncertain. For example, if NASA awards Phase 2 agreements in 2026, the companies would have about 4 years to have their stations certified for NASA crew use, launched and on-orbit. Our analysis of NASA projects that have launched since 2010 found that on average it took the projects a little over 5 years to go from beginning development to launch. If the companies take as long as the average for NASA major projects, they would be more likely to achieve their initial station capabilities in 2031.

According to the August 2025 Directive, one of the reasons NASA changed its acquisition strategy was to provide more flexibility to the companies on their approach to try to move more quickly. According to NASA officials, the new approach will enable the commercial partners to go faster because they can work using their own internal processes without having to meet NASA requirements. For example, the officials explained that allowing the stations to conduct the demonstration mission with a non-NASA crew allows the companies to achieve the initial crewed capability faster because the station does not have to go through the NASA human-rating process prior to conducting the demonstration.

While NASA's transition approach emphasizes the need for speed, as of March 2026, NASA has not released its Phase II final announcement for proposals. In addition, as of March 2026, NASA has not issued details on Phase 3 and has proposed an alternative acquisition approach. NASA is seeking input from industry on the alternative approach that will further delay contract or agreement awards.

Budget constraints and workforce implications. NASA is concerned that its budget will be too constrained to support all its efforts. NASA officials noted that NASA must balance the funding needs of commercial space station development, ISS maintenance and deorbit, and maintaining the Commercial Crew and Cargo programs.¹² If NASA does not have enough funding to sustain its transition related efforts, it could result in NASA needing additional funding from Congress, elimination of or budget reductions to other agency programs, a gap in human presence in LEO, or the loss of commercial transportation services. In March 2026, a NASA official said that NASA likely would only have

enough funding to support one commercial station. In addition, the official raised concerns about limited LEO commercial market growth and demand.

NASA recently experienced almost a year of budgetary uncertainty. For example, the President's fiscal year 2026 budget request proposed reduced funding for the agency. According to NASA, this reduction would have resulted in reduced ISS research and potential contract terminations for companies that support ISS operations, including crew and cargo transportation providers. However, Congress subsequently funded NASA at a level closer to the prior fiscal year.¹³

According to NASA officials, this budget uncertainty resulted in workforce challenges. NASA officials stated that they had planned to ramp up the CLDP workforce in fiscal year 2025 but paused doing so due to budget constraints and an agencywide hiring freeze. The program also reported that it experienced some personnel losses in 2025 due to the deferred resignation program.¹⁴ According to officials, as of February 2026, CLDP has filled several of its senior manager positions with permanent replacements. Additionally, the Acting Administrator's August 2025 directive set an annual cap on the 1) amount of full-time engineers supporting the Space Operations Mission Directorate team; and 2) maximum overhead cost to manage the team. In February 2026, CLDP officials told us that they may need to update the program's workforce levels based on final NASA acquisition approach decisions.

ISS health and maintenance issues and controlled deorbit risks. While the most recent ISS life extension analysis certified that the ISS's primary structure is operable through 2028, NASA and Roscosmos have been monitoring cracks in the transfer tunnel in the Russian segment of the station that resulted in air leaks in the station. As of February 2026, NASA said that the current air leaks have been mitigated with a sealant. However, the fundamental structural issues that caused the cracks originally remain, and NASA and Roscosmos continue to monitor and analyze the cracks. ISS program officials said that the rest of the ISS's primary structure shows sufficient life through 2030 and potentially to 2040.

Additionally, NASA officials emphasized the importance of maintaining crew and cargo aboard the ISS for maintenance and operations and preparing the station for a controlled deorbit. According to officials, the ISS needs to have at least three crew members aboard for spacewalks, crew maintenance, and processing. Additionally, officials stated that a regular cadence of four to five cargo flights a year is necessary to maintain ISS operations and conduct a controlled deorbit. Should NASA be unable to support the number of crewmembers or launch the necessary number of flights, it could result in the ISS being uncrewed for a period of time. The longer it remains uncrewed, the greater the risk that loss of critical functionality could lead to an uncontrolled deorbit.

Transportation vehicle availability. NASA documentation stated that there is an increasing risk to the availability of crew and cargo transportation vehicles that are NASA certified. As of February 2026, the SpaceX Crew Dragon is the only certified vehicle to fly NASA crews to the ISS. The Boeing Starliner is currently going through the certification process. For cargo transportation, there are two certified vehicles: the Space X Cargo Dragon and the Northrup Grumman Cygnus. In addition, NASA may order Dream Chaser resupply flights to the ISS from Sierra Space once it successfully launches its cargo vehicle. However, the Commercial Crew Program and the ISS Program—which also manages commercial cargo procurements—are working to ensure that transportation capability is available and that they are continuing to certify additional vehicles.

What are the potential implications if NASA is unable to maintain a continuous presence in LEO?

NASA recognizes that any number of factors—budget uncertainties, slower-than-expected development of commercial space stations, structural loss of the ISS, among others—could result in the U.S. not being able to maintain a continuous presence in LEO. If this occurs, NASA identified three primary potential implications:

- **Decrease or loss of commercial LEO space economy viability.** Without a consistent and predictable cadence of crewed missions, companies involved in the commercial LEO market—such as those that provide commercial crew and cargo transportation, research, or manufacturing services in LEO—would face challenges sustaining practicable business cases. According to NASA documentation and a 2024 industry analysis on the potential for a gap in ISS operations, a gap would significantly affect the current commercial LEO market customer base. Each of the companies interviewed as part of the industry analysis reported that a 1-to-2-year gap in operations, without mitigation, would negatively affect them, and that the effect would increase with each year of a gap. This included losing significant revenue or capabilities, or going out of business depending on the company and service provided and the duration of the gap. Each of the companies interviewed indicated a desire for NASA to provide guidance on its plans, such as service type and transportation flight requirements, and timelines to help reduce the high level of market uncertainty.
- **Loss of LEO-based science and technology research.** According to NASA's LEO microgravity strategy, maintaining a continuous presence in LEO enables NASA to continue risk reduction activities for sending crew to the Moon, Mars, and beyond, which is a key priority for NASA. The risk reduction activities are a priority because science and technology developments in LEO support the development of capabilities that are necessary to support future long-duration human spaceflight initiatives in representative environments, i.e., microgravity. Without crew continuously in LEO, NASA risks losing its ability to conduct applied research on crew health and performance in the lunar or Martian environments.
- **Threat to maintaining leadership in LEO.** A significant gap in operations in LEO risks weakening NASA's and U.S. industry's skills and capabilities, according to NASA's LEO microgravity strategy. NASA leadership has said that it could be detrimental if the U.S. loses these skills and capabilities because it poses a threat to the nation's leadership in LEO as other countries begin to operate in LEO. For example, China now has a continuous presence in LEO with its Tiangong space station.¹⁵ The U.S. has continuously had crew operating for over 25 years aboard the ISS. During this time, the U.S. has demonstrated its leadership and supported its international partners in human spaceflight operations and space-related science and technology in LEO.

While NASA has identified risks that could lead to a gap in continuous human presence in LEO, it has not yet assessed the likelihood or duration of a gap. To determine the likelihood and potential duration of a gap, NASA would need to receive and review the commercial station agreement proposals to understand potential commercial space station timelines. NASA's risk management process calls for estimating the probability and consequences of a risk, creating and executing mitigation or contingency plans to address the risk, and documenting and communicating the process.¹⁶ By assessing the likelihood and duration of a potential gap in continuous presence in LEO, NASA can make better risk-informed decisions on how to mitigate this risk. Further, this information would help Congress understand the status of commercial space station development and NASA's ability to meet U.S. policy and inform future budgetary decisions.

When does NASA need to make a decision on when to deorbit the ISS?

NASA officials stated that a decision will need to be made next year on whether to deorbit the ISS in 2030 as currently planned. If a decision is made to delay deorbiting, then it and each of the ISS international partners will need time to secure additional funding to support continued operations, order additional crew and cargo vehicles, and acquire supply spares.

NASA officials explained that they plan to use a standard review process to assess the deorbit vehicle's readiness for launch and whether the agency is ready to retire the ISS, among other things. Officials said that during this review process, they coordinate with key parties within the Space Operations Mission Directorate—including Commercial Crew and ISS programs—as well as with the NASA Administrator and Associate Administrator to make decisions internally.¹⁷ If NASA needed to extend ISS operations, the officials stated that they would involve the same parties as when they extended ISS operations from 2024 to 2030. This process includes briefing the Executive Office of the President and other federal organizations, and coordinating with international partners to make the final decision to extend ISS operations before Congress considers approving the extension.

While NASA officials explained that NASA and its stakeholders have decided to extend ISS operations in the past using a standard process, NASA must also consider how this decision could potentially affect the development of the LEO economy more broadly. NASA, commercial companies, and investors have assumptions about the commercial sector's ability to support both NASA and other customer needs in LEO and within what time frames. In a 2024 hearing on U.S. activities in LEO, representatives from two companies developing commercial space stations noted that having certainty in the ISS retirement date is important because their investors use that timeline to make decisions about their investments in the companies.¹⁸ In addition, in a March 2026 congressional hearing on the transition, an industry group representative stated that NASA's shifting timelines and demand signals have an effect on commercial space companies. The representative stated that these companies reported finding changes in direction from NASA to be concerning and confusing.¹⁹

Officials said that they have not documented the assessment process, including the factors—such as key assumptions, risks, and uncertainties—that they will use to make this decision about the agency's readiness to retire and deorbit the ISS as planned in 2030. Documenting the process in the near term is even more important as NASA considers an alternative approach that could extend ISS operations beyond 2030. NASA's policy for governance and strategic management calls for strategic, transparent, and informed decision-making that includes communicating decisions and their rationale.²⁰ Additionally, the policy calls for programs to communicate a clear understanding of their risks and benefits and ensure the workforce has the proper experience to execute its mission. Further, *Standards for Internal Control in the Federal Government* states that management should document its internal controls—or processes management uses to help an entity achieve its objectives—and communicate quality information to all levels of the entity.²¹ By documenting the assessment process and factors that will be used to decide whether to retire or extend ISS operations, NASA would improve the rationale used to inform its decision and the transparency of its assessment.

What are some uncertainties for NASA to consider as it finalizes its plans for transitioning from ISS to commercial stations?

NASA is still developing its transition plans and many uncertainties remain. NASA's changes to its acquisition strategies introduced new ambiguity in these plans. As of May 2026, NASA was still in the process of finalizing its acquisition approach and introduced a new alternative that it is seeking industry input on. Figure 7, shown below, includes several uncertainties for NASA to consider as it finalizes these plans.

Figure 7: Uncertainties in Maintaining Human Presence in Low-Earth Orbit (LEO)

LEO TRANSITION	LEO ECONOMY	LEO REGULATORY FRAMEWORK
<ul style="list-style-type: none"> • The National Aeronautics and Space Administration's (NASA) decision regarding its acquisition approach and the number of stations that they can support • Commercial companies' ability to develop and launch their space stations before NASA's deorbits the International Space Station (ISS) as planned in 2030 • Deorbit vehicle's preparedness to launch in 2029 • Confirmation of Russia's plans for its segment of the ISS and how it effects the plans for the U.S. segment and the deorbit process • Definition of NASA's certification approach and time frames • Mechanism that will connect NASA and other U.S government customers to research opportunities on the commercial stations 	<ul style="list-style-type: none"> • Actions needed to stimulate demand from private and international customers if the LEO market does not develop as anticipated, including the LEO transportation market • Number of countries or private entities willing to contract directly with commercial companies for commercial space services • Companies' willingness to continue to develop their commercial space stations if not awarded a Commercial LEO Development Program (CLDP) Phase 2 agreement or Phase 3 contract • Resources NASA needs to contribute if it remains the principal customer of commercial space 	<ul style="list-style-type: none"> • Whose role it will be to regulate commercial space station use • Feasibility of the commercial space station partners obtaining commercial liability insurance • NASA's role in liability arrangements, including whether it will need to subsidize or indemnify liability insurance

Source: GAO analysis of NASA documentation. | GAO-26-107805

If NASA maintains its current approach, commercial companies will have approximately 4 years to perform crewed demonstrations and NASA has to finalize several critical details of its approach. Specifically, the CLDP has not yet determined key aspects of station certification and eventual operations. In addition, officials said that they are reviewing the Starliner Investigation report to determine what findings and lessons learned are applicable to their acquisition strategy. Therefore, changes to the current strategy may also affect these plans.

Conclusions

NASA has a stated goal of minimizing the potential for a gap in continuous human presence in LEO. To achieve this goal, it is important that NASA proceeds with the next phase of commercial space station acquisition as quickly as possible or determines that it is in the best interest of the agency to extend International Space Station operations. The schedule for commercial companies developing and demonstrating commercial space stations is aggressive, and it becomes even more constrained the longer NASA waits to finalize its plans. At the same time, the agency will be operating in a dynamic and likely challenging environment as it faces budgetary constraints and works to rebuild its workforce.

It will also be a crucial time for NASA to gather information that it needs to determine whether there will be a gap in its continuous presence in LEO, and if so, make plans to minimize the risk of a gap. This includes encouraging the

growth of the LEO economy by identifying options for supporting the space transportation market during the transition to using commercial space stations. Otherwise, NASA may not ultimately achieve its goal to be one of many customers buying services from commercial stations. The agency only has the next year and a half to determine if it needs to extend ISS operations beyond 2030. It cannot wait until 2030 to determine whether it is ready to deorbit the ISS. NASA's assessment of its readiness to deorbit will be a factor for agency decision-makers and external stakeholders, such as Congress, to decide realistic time frames for deorbiting the ISS and transitioning to using commercial space stations.

Recommendations for Executive Action

We are making the following 2 recommendations to NASA:

The NASA Administrator, in coordination with the Space Operations Mission Directorate, should use its risk management process to assess the likelihood and duration of a gap in continuous capability or human presence in LEO, including plans to mitigate the likelihood of a gap, if necessary. (Recommendation 1)

The NASA Administrator, in coordination with the Space Operations Mission Directorate, should document the assessment process that NASA will use to make an informed decision on NASA's readiness to retire and deorbit the ISS as planned in 2030. This includes documenting the factors that will be used to make the decision such as the key assumptions, risks, and uncertainties. (Recommendation 2)

Agency Comments

We provided a draft of this report to NASA for review and comment. In its comments, reproduced in appendix I, NASA concurred with our recommendations. NASA also provided technical comments, which we incorporated as appropriate.

How GAO Did This Study

To determine the status of NASA's plans for transitioning from the ISS to commercial space stations, roles and responsibilities of those involved, and how the transition might affect research capabilities in LEO, we reviewed NASA documentation on the development of commercial space stations and the current operations and planned deorbit of ISS. This includes relevant NASA strategies, transition plans, and CLDP and ISS program documentation. We also reviewed U.S. policy related to maintaining an uninterrupted capability in LEO as found in statute. To determine NASA's plans for supporting companies in the design and development of, and eventual buying of services on, commercial space stations as well as the commercial companies' station designs, we reviewed CLDP documentation, such as program review slides, and the awarded contract and Space Act Agreements. We also reviewed the August 2025 directive on the revised CLD Phase 2 acquisition strategy and the draft Phase 2 Announcement for Proposals. To understand the status of ISS operations and plans for the ISS deorbit, we reviewed ISS program documentation, the deorbit vehicle contract, and interviewed ISS program officials.

To identify directorate and program level risks that might affect the progress of the transition to commercial stations in LEO and to understand NASA's plans to mitigate those risks, we reviewed relevant ISS and CLDP program and Space Operations Mission Directorate risk documentation and status review presentations and interviewed program and mission directorate officials. To understand the risk of an ambitious commercial space station development timeline, we compared the CLDP acquisition timeline from preliminary design review to launch against the average timelines of 35 NASA major projects that launched between 2011 and 2025. In addition, to understand the potential

implications of a gap in U.S. presence in LEO, we reviewed NASA strategy and industry analysis documentation. We assessed mission directorate approaches for updating risks and developing mitigation plans against NASA's risk management process.

To identify upcoming key decision points for NASA leadership related to the transition, including plans for assessing the readiness to transition to commercial space stations, we reviewed CLD and ISS program documentation and interviewed officials. We also determined the information and communication component of *Standards for Internal Control in the Federal Government*—specifically, that management should document its processes and internally communicate quality information to achieve an entity's objectives—was applicable to our review. We reviewed ISS program documentation and interviewed program officials to determine how the program will communicate its assessment that informs its decision to retire the ISS or extend its operations. We also reviewed this programmatic information and NASA's plans for assessing readiness to deorbit the ISS against NASA's Governance and Strategic Management Handbook.

To identify areas of uncertainty for NASA to consider as it executes its LEO plans, we reviewed program documentation, market studies, and interviewed relevant NASA officials. Specifically, we reviewed NASA's funding availability, and how many companies NASA plans to award agreements and contracts. We looked at market studies and other documentation related to developing an economy in LEO, which included analysis of whether commercial companies will be able to secure other customers to complete their business case. We also reviewed CLDP acquisition documentation related to Phase 2 and Phase 3 to determine the approaches being considered.

We conducted this performance audit from September 2024 to June 2026 in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

List of Addressees

The Honorable Ted Cruz
Chairman
Committee on Commerce, Science, and Transportation
United States Senate

We are sending copies of this report to the appropriate congressional committees, the Administrator of NASA, and other interested parties. In addition, the report is available at no charge on the GAO website at <http://www.gao.gov>.

GAO Contact Information

For more information, contact: William Russell, Director, Contracting and National Security Acquisitions, RussellW@gao.gov.

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Appendix I: Comments from the National Aeronautics and Space Administration

National Aeronautics and Space Administration

Mary W. Jackson NASA Headquarters
Washington, DC 20546-0001



Reply to Attn of: Space Operations Mission Directorate

Mr. W. William Russell
Director
Contracting and National Security Acquisitions
United States Government Accountability Office
441 G Street, NW
Washington, DC 20548

Dear Mr. Russell:

The National Aeronautics and Space Administration (NASA) appreciates the opportunity to review and comment on the Government Accountability Office (GAO) draft report entitled, "Low-Earth Orbit: NASA Faces Impending Decisions for Replacing International Space Station with Commercial Stations" (GAO-26-107805), dated April 10, 2026.

In its draft report, GAO found that NASA is planning to retire and deorbit the International Space Station (ISS) in 2030 and replace it with one or more commercially owned and operated space stations. GAO also reported that NASA has been working with six commercial companies to mature their initial space station designs, with plans to award one or more Space Act Agreements in 2026 to continue maturing the stations' designs until the companies can conduct an in-space crewed demonstration. Additionally, GAO reported that NASA is exploring an alternative approach that is seeking to develop a new space station that will initially attach to the ISS and eventually detach and become its own station. GAO found that NASA is concerned about having a gap in continuous human presence in low-Earth orbit (LEO); however, the Agency has not yet assessed the likelihood or potential duration of a gap. Finally, GAO found that while NASA has used a standard process to decide to extend ISS operations in the past, the Agency has not documented the current assessment process.

GAO makes two recommendations addressed to the NASA Administrator. Specifically, GAO recommends the NASA Administrator, in coordination with the Space Operations Mission Directorate (SOMD):

Recommendation 1: Use its risk management process to assess the likelihood and duration of a gap in continuous capability or human presence in LEO, including plans to mitigate the likelihood of a gap, if necessary.

Management's Response: NASA concurs with this recommendation. SOMD, with the ISS Program and the Commercial LEO Development Program, will continually monitor the development of future Commercial LEO Destinations (CLDs) and adjust the plan for decommissioning the ISS as appropriate to maintain continuous United States presence in LEO. The Programs will continue to use the NASA risk

management process to identify risks during the LEO transition period and will establish risk mitigations.

Estimated Completion Date: December 31, 2028.

Recommendation 2: Document the assessment process that NASA will use to make an informed decision on NASA's readiness to retire and deorbit the ISS as planned in 2030. This includes documenting the factors that will be used to make the decision such as the key assumptions, risks, and uncertainties.

Management's Response: NASA concurs with this recommendation. NASA has identified key milestones for both a potential ISS extension decision and ISS deorbit. SOMD will refine the decision criteria over the next year and work with stakeholders to determine the appropriate end of the ISS's service life. The ISS deorbit criteria will be published in a living document that will continually be refined as development of CLDs continues.

Estimated Completion Date: June 30, 2027.

We have reviewed the draft report for information that should not be publicly released. As a result of this review, we have not identified any information that should not be publicly released.

Once again, thank you for the opportunity to review and comment on the subject draft report. If you have any questions or require additional information regarding this response, please contact Michelle Bascoe at (202) 384-6027.

Sincerely,

JOEL MONTALBANO
Digitally signed by JOEL MONTALBANO
 Date: 2028.05.21 10:45:34 -04'00'

Joel Montalbano
 Associate Administrator for Space Operations Mission Directorate (Acting)

cc:
 Director, Johnson Space Center/Ms. Wyche
 Director, International Space Station/Mr. Keaton (Acting)

Accessible Text for Appendix I: Comments from the National Aeronautics and Space Administration

National Aeronautics and Space Administration

Mary W. Jackson NASA Headquarters
Washington, DC 20546-0001

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Space Operations Mission Directorate

Mr. W. William Russell
Director
Contracting and National Security Acquisitions
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441 G Street, NW
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Sincerely,

Joel Montalbano
Associate Administrator for Space Operations Mission Directorate (Acting)

cc:
Director, Johnson Space Center/Ms. Wyche
Director, International Space Station/Mr. Keaton (Acting)

Endnotes

¹51 U.S.C. § 70501.

²National Aeronautics and Space Administration Transition Authorization Act of 2017, Pub. L. No. 115–10, § 303.

³National Aeronautics and Space Administration, *NASA Plan for Commercial LEO Development*, (June 7, 2019).

⁴National Aeronautics and Space Administration, NASA Office of Inspector General, *NASA's Management of Risks to Sustaining ISS Operations through 2030*, IG-24-020 (Washington, D.C.: Sept. 26, 2024).

⁵In June 2024, NASA awarded a contract valued up to \$843 million to SpaceX to design and build the deorbit vehicle. The vehicle is comprised of a SpaceX Dragon spacecraft with docking and rendezvous capabilities and a Dragon trunk with propulsion capability. NASA estimates that SpaceX will complete the deorbit vehicle in 2028. GAO, *NASA: Assessments of Major Projects*, GAO-25-107591 (Washington, D.C.: July 1, 2025).

⁶A preliminary design review is a milestone in the systems engineering process, and evaluates whether the preliminary design meets all system requirements and that a project is ready to proceed to the next phase of development. System requirements are detailed specifications that

describe what a system must do to ensure that it meets its intended purpose. For this program, each company demonstrates that it meets its company's requirements for the preliminary design review.

⁷In February 2020, NASA awarded Axiom Space a firm-fixed price, indefinite-delivery, indefinite-quantity contract which enables at least one habitable commercial module to be attached to the ISS. In December 2021, NASA awarded funded Space Act Agreements for concept maturation and the initial development of commercial space stations to three companies: Blue Origin, Northrop Grumman, and Nanoracks. In October 2023, Northrop Grumman and NASA terminated their funded Space Act Agreement, but continued their unfunded Space Act Agreement, which NASA awarded in 2023, for a commercial LEO capability that is not classified as a commercial space station, and therefore is not included in our review. NASA provided Northrop Grumman technical assistance for the commercial LEO capability being pursued through the unfunded Space Act Agreement. Also, the funded Space Act Agreement for the commercial space station concept "Starlab" awarded to Nanoracks in 2021, was amended in April 2024 to reflect the name change to Starlab Space LLC, upon Voyager Space Holdings, Inc. acquiring Nanoracks.

⁸Space Act agreements are transactions other than contracts, leases, and cooperative agreements. Congress granted NASA the authority to enter into these types of transactions in the National Aeronautics and Space Act of 1958 to achieve its mission. Under a funded Space Act Agreement, appropriated funds are transferred to a domestic partner, such as a private company or a university, to accomplish an agency mission. These agreements do not include requirements that generally apply to government contracts entered into under the authority of the Federal Acquisition Regulation. Unfunded agreements accomplish the same goals but no appropriated funds are transferred.

⁹NASA awarded seven unfunded Space Act Agreements to Blue Origin, Northrop Grumman, Sierra Space, SpaceX, Special Aerospace Services, ThinkOrbital, Inc., and Vast Space to support the development of new space capabilities relevant to NASA's exploration strategy. Only three of the awards went to companies working on commercial space station designs: Sierra Space, SpaceX, Vast Space.

¹⁰Section 507 of the National Aeronautics and Space Administration Authorization Act of 2005, Pub. L. No. 109-155, designated the U.S. segment of the ISS as a National Laboratory. It directed the NASA Administrator to seek to increase ISS utilization by other federal entities and the private sector through partnerships, cost-sharing agreements, and other arrangements that would supplement NASA funding of the ISS. Subsequently, NASA reported signing a cooperative agreement with the Center for the Advancement of Science in Space, a not-for-profit entity, to manage the activities of the ISS National Laboratory.

¹¹NASA plans to assess the maturity of the companies' space station designs at the end of Phase 1 at a preliminary design review. To determine the status of the preliminary designs of the commercial stations, each company plans to hold a preliminary design review that is in line with their company requirements.

¹²GAO, *Commercial Launch Vehicles: NASA Taking Measures to Manage Delays and Risks*, GAO-11-692T (Washington, D.C.: May 26, 2011); *National Aeronautics and Space Administration: Acquisition Approach for Commercial Crew Transportation Includes Good Practices, but Faces Significant Challenges*, GAO-12-282 (Washington, D.C.: Dec. 15, 2011); *NASA Commercial Crew Program: Schedule Pressure Increases as Contractors Delay Key Events*, GAO-17-137 (Washington, D.C.: Feb. 16, 2017); and *NASA Commercial Crew Program: Plan Needed to Ensure Uninterrupted Access to the International Space Station*, GAO-18-476 (Washington, D.C.: July 11, 2018).

¹³In January 2026, NASA received an appropriation for Space Operations for fiscal year 2026 of \$4,175,000,000, to remain available until September 30, 2027. Commerce, Justice, Science; Energy and Water Development; and Interior and Environment Appropriations Act, 2026, Pub. L. No. 119-74, 140 Stat. 42.

¹⁴Refers to the Office of Personnel Management's government-wide deferred resignation program, which provides federal employees with an option to submit a deferred resignation letter with resignation effective on September 30, 2025. United States Office of Personnel Management Memorandum, *Guidance Regarding Deferred Resignation Program* (Jan. 28, 2025).

¹⁵Commercial Space Federation, *Redshift: The Acceleration of China's Commercial and Civil Space Enterprise & The Challenge to America* (September 2025).

¹⁶NASA's risk management process as outlined in Procedural Requirements (NPR) 8000.4C, *Agency Risk Management Procedural Requirements* (Apr. 19, 2022).

¹⁷In their role of Programmatic Authority, the Mission Directorate Associate Administrator approves launch readiness and reports on program and project progress to Agency forums. For example, the Associate Administrator reports to agency leadership when program performance could impact Agency commitments and performance goals with stakeholders. Stakeholders may include internal or external organizations. National Aeronautics and Space Administration, *NASA Governance and Strategic Management Handbook*, NASA Policy Directive NPD 1000.0C (Jan. 29, 2020).

¹⁸Dr. Mary Lynne Dittmar, Chief Government and External Relations Officer, Axiom Space; and Mr. Dylan Taylor, Chairman and CEO, Voyager Space, *ISS and Beyond: The Present and Future of American Low-Earth Orbit Activities*, testimony before the Subcommittee on Space and Aeronautics of the Committee on Science, Space, and Technology of the House of Representatives, 118th Cong., 2nd sess., February 14, 2024.

¹⁹Mr. Dave Cavossa, President, Commercial Space Federation, *The Future of Low Earth Orbit: From the ISS to Commercial Platforms*, testimony before the Subcommittee on Space and Aeronautics of the Committee on Science, Space, and Technology of the House of Representatives, 119th Cong., 2nd sess., March 25, 2026.

²⁰NASA Policy Directive 1000.0C, *NASA Governance and Strategic Management Handbook*, (Jan. 29, 2020).

²¹GAO, *Standards for Internal Control in the Federal Government*, [GAO-25-107721](#) (Washington, D.C.: May 15, 2025).