

Why GAO Did This Study

NASA plans to return astronauts to the moon to make new scientific discoveries, generate economic benefits, and inspire a new generation. To help support crewed lunar landings, NASA plans to use the Gateway as a habitat and safe work environment for astronauts. NASA plans to first use the Gateway to house crew during the Artemis IV lunar landing mission, which NASA is planning to conduct in September 2028. NASA tracks the Gateway program's progress via cost and schedule commitments.

A House Report contains a provision for GAO to continue reviewing NASA's lunar-focused programs. This report focuses on the Gateway program and its NASA-led development projects. It addresses (1) the Gateway program's plans to update the initial capability's cost and schedule analysis; (2) the extent to which the Gateway program made progress with its U.S.-led projects needed for the Artemis IV mission and is addressing project risks; and (3) NASA's process for determining how it will use the Gateway beyond Artemis IV, including for Mars missions.

GAO analyzed NASA documentation and interviewed officials on the Gateway program's cost, schedule, risks, and role in the Artemis architecture.

What GAO Recommends

GAO is making one recommendation, that NASA should ensure that the Gateway program documents and communicates an overall mass management plan before its next program-level review. NASA agreed with GAO's recommendation.

View [GAO-24-106878](#). For more information, contact William Russell at (202) 512-4841 or RussellW@gao.gov.

ARTEMIS PROGRAMS

NASA Should Document and Communicate Plans to Address Gateway's Mass Risk

What GAO Found

The National Aeronautics and Space Administration (NASA) plans to build a sustained human lunar presence and ultimately travel to Mars through a series of missions known as Artemis. For Artemis IV, the agency is developing the Gateway—the first space station planned to orbit the moon. NASA committed to launching the Gateway initial capability by December 2027 at a cost of \$5.3 billion. The launch will include the first components of the Gateway—the Power and Propulsion Element (PPE) and the Habitation and Logistics Outpost (HALO).

The Gateway program plans to update the analysis it used to inform its cost and schedule commitments at a fall 2024 program-level review. This will help determine the feasibility of the Artemis IV mission date. To reach lunar orbit and ensure all systems work as planned, the PPE and HALO need to launch at least 12 months before the Artemis IV mission, or 3 months earlier than Gateway's current committed date. NASA officials said the program plans to work to an accelerated, to-be-determined date that would provide more schedule flexibility.

Gateway Program Launch Date Options for Artemis IV Mission



Source: GAO analysis of NASA documentation. | GAO-24-106878

The Gateway program's projects—including PPE and HALO—made varying degrees of progress over the last year. However, the PPE and HALO projects face several significant challenges. For example, their combined mass is greater than their mass target. Mass is one of many factors that the program considers in its overall design. If they cannot meet their mass target, it may affect their ability to reach the correct lunar orbit. The program has not yet documented an overall mass management plan, which would describe the program's mass reduction approach and priorities for key trade-off decisions. Documenting and communicating this plan will help to ensure that the program and its projects agree on how to address the mass challenge.

NASA held two reviews in 2023 to break down high-level Artemis exploration objectives and goals into the programs, projects, or systems needed to achieve them. So far, NASA has used these reviews to assign roles to the Gateway that align to goals of the earlier Artemis missions, like returning humans to the moon. NASA plans to use upcoming reviews to make key decisions related to Mars missions, which could inform how NASA might use the Gateway in the future.