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Comptroller General
of the United States

Accessible Version

August 15, 2024

The Honorable Arati Prabhakar
Director
Office of Science and Technology Policy
1650 Pennsylvania Avenue
Washington, D.C. 20504

Priority Open Recommendations: Office of Science and Technology Policy

Dear Director Prabhakar:

The purpose of this letter is to provide an update on the overall status of the Office of Science and Technology Policy’s (OSTP) implementation of GAO’s recommendations and to call your continued personal attention to areas where open recommendations should be given high priority.¹ In November 2023, we reported that, on a government-wide basis, 75 percent of our recommendations made 4 years ago were implemented.² As of July 2024, OSTP had eight open recommendations. Fully implementing these open recommendations could significantly improve OSTP’s operations.

Since our May 2023 letter, OSTP has implemented two of our seven previously identified priority open recommendations:

- As of March 2024, OSTP provided information demonstrating it had implemented leading practices that enhance and sustain collaboration, consistent with what we outlined in our November 2019 report on public access to research results. By taking steps to fully implement the leading collaboration practices GAO has identified, OSTP and the subcommittee member agencies are better able to effectively marshal their collective efforts to support public access to research results.
- In June 2024, the National Science and Technology Council, in coordination with OSTP, issued a progress report on the Future Advanced Computing Ecosystem strategic plan, summarizing agencies’ investments and activities towards the national objectives outlined in

¹Priority recommendations are those that GAO believes warrant priority attention from heads of key departments or agencies. They are highlighted because, upon implementation, they may significantly improve government operations, for example, by realizing large dollar savings; eliminating mismanagement, fraud, and abuse; or making progress toward addressing a high-risk or duplication issue.

²GAO did not make any recommendations to OSTP in fiscal year 2019. Therefore, a comparable four-year implementation rate cannot be determined for OSTP. GAO, *Performance and Accountability Report: Fiscal Year 2023*, [GAO-24-900483](#) (Washington, D.C.: Nov. 15, 2023).

the 2020 plan.³ In line with what we recommended in our September 2021 report, OSTP officials said they plan to publish progress reports every 3 years. Such information will help Congress and the public gain a better understanding of the efforts made by federal agencies to sustain and enhance U.S. scientific, technological, and economic leadership in high-performance computing.

We ask that you direct your continued attention to the remaining five priority recommendations. We are also adding three new priority recommendations related to updating the 2019 critical minerals national strategy to incorporate new statutory requirements, communicating across federal agencies on implementing authorities to regulate artificial intelligence (AI), and sharing information across agencies on addressing research security risks. (See the Enclosure for the list of these recommendations.)

The eight priority recommendations fall into the following four areas.

Managing climate change risks. OSTP can strengthen interagency efforts to enhance the climate resilience of federal, state, and local infrastructure investments by implementing GAO's two priority recommendations in this area. Since February 2013, we have included the [Limiting the Federal Government's Fiscal Exposure by Better Managing Climate Change Risks](#) area on our High-Risk List.⁴ One of our priority recommendations in this area involves identifying the best available climate information for use in infrastructure planning. The other recommends clarifying sources of local assistance for incorporating climate-related information and analysis into infrastructure planning.

Enactment of the Infrastructure Investment and Jobs Act in November 2021 provides additional impetus for OSTP to take action through its role in interagency coordination on federal transportation research and communication infrastructure efforts.⁵ As we state in the [High-Risk List](#), the projected impact of climate change on U.S. infrastructure is a key source of federal fiscal exposure because of the size of the federal government's investment in projects such as roads, bridges, and drinking water systems and states' increasing reliance on the federal government for disaster assistance. Implementing these two priority recommendations would help ensure federally funded infrastructure projects adequately address risks from climate change and last their intended lifespans.

Addressing national goals through strategic planning and improved data. OSTP provides leadership to agencies in working together to address a variety of national goals. We have four priority recommendations that, if implemented, would help agencies improve how they track progress and address goals for various science and technology areas.

Specifically, for high-performance computing, we made one recommendation that OSTP address characteristics of a national strategy, such as establishing performance measures and identifying the resources needed for implementing the 2020 strategic plan. Including such characteristics can improve agencies' ability to achieve the 2020 plan's goals.

³National Science and Technology Council, *FY2021-2023 Progress Report on Pioneering the Future Advanced Computing Ecosystem: A Strategic Plan* (June 2024).

⁴GAO, *High-Risk Series: An Update*, [GAO-13-283](#) (Washington, D.C.: Feb. 14, 2013).

⁵Infrastructure Investment and Jobs Act, Pub. L. No. 117-58, §§ 25,013, 90,008, 135 Stat. 429, 868, 1349 (2021) (codified at 49 U.S.C. § 5506(e)(3), 47 U.S.C. § 921 (note)).

In the area of advanced manufacturing, we made one recommendation that OSTP identify information to collect from federal agencies to determine whether the objectives outlined in the National Strategic Plan for Advanced Manufacturing are being achieved. Without specifying such information, agencies may lack consistent, comprehensive information that would help them track progress towards the objectives.

In the area of critical materials, we made two recommendations. The first is that OSTP develop a plan to address data limitations. Implementing this recommendation would enhance federal agency coordination under the National Materials and Minerals Policy, Research and Development Act of 1980.⁶ This act addressed the need for a coordinated program to ensure the availability of materials critical for national economic well-being, defense, and industrial production.⁷ The second recommendation is that OSTP, in coordination with other agencies, should update the 2019 critical minerals national strategy as it relates to recovery and substitution. Updating the strategy would provide greater assurance of the strategy's usefulness to congressional and agency decision makers and better ensure accountability for its implementation.

Regulating artificial intelligence. OSTP can support agency efforts to manage AI by implementing GAO's one priority recommendation in this area. We recommended that OSTP inform agencies of their status as implementing agencies with regulatory authorities over AI. A lack of such guidance has contributed to agencies not fully implementing fundamental practices in managing AI. Establishing and documenting a shared list of implementing agencies and communicating the designation status of the agencies are critical to determining the federal requirements that apply to each agency. Until OSTP completes these steps, the government's AI efforts could be hindered.

Addressing research security risks. OSTP has an important role to play in enhancing agencies' awareness of and collaboration on complex risks and challenges, such as those related to research security risks. We recommended that OSTP, in coordination with other agencies, facilitate information sharing on identifying foreign ownership, control, or influence. Officials from the research and development funding agencies we reviewed noted challenges in identifying foreign ownership, and stated that additional guidance could be beneficial when vetting potential awardees and identifying risk mitigation options. Implementing our recommendation could help federal agencies safeguard federal funding from foreign threats more consistently and effectively across the federal government.

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In April 2023, we issued our biennial update to our [High-Risk List](#). This list identifies government operations with greater vulnerabilities to fraud, waste, abuse, and mismanagement. It also identifies the need for transformation to address economy, efficiency, or effectiveness challenges.⁸ One of our high-risk areas—[limiting the federal government's fiscal exposure by better managing climate change risks](#)—is shared among multiple entities, including OSTP.

⁶30 U.S.C. §§ 1601-1605.

⁷30 U.S.C. § 1601(a).

⁸GAO, *High-Risk Series: Efforts Made to Achieve Progress Need to be Maintained and Expanded to Fully Address All Areas*, [GAO-23-106203](#) (Washington, D.C.: Apr. 20, 2023).

Several other government-wide, high-risk areas also have direct implications for OSTP and its operations. These include (1) [improving the management of IT acquisitions and operations](#), (2) [improving strategic human capital management](#), (3) [managing federal real property](#), (4) [ensuring the cybersecurity of the nation](#), and (5) managing the [government-wide personnel security clearance process](#).

We urge your attention to these government-wide, high-risk issues as they relate to OSTP. Progress on high-risk issues has been possible through the concerted actions and efforts of Congress, the Office of Management and Budget (OMB), and the leadership and staff in entities, including within OSTP. In March 2022, we issued a report on key practices to successfully address high-risk areas, which can be a helpful resource as you continue to make progress to address high-risk issues.⁹

In addition to your continued attention on these issues, Congress plays a key role in providing oversight and maintaining focus on our recommendations to ensure they are implemented and produce their desired results. Legislation enacted in December 2022 includes a provision for GAO to identify any additional congressional oversight actions that can help agencies implement priority recommendations and address any underlying issues relating to such implementation.¹⁰

Congress can use various strategies to address our recommendations, such as incorporating them into legislation. Congress can also use its budget, appropriations, and oversight processes to incentivize executive branch actions on our recommendations and monitor progress. For example, Congress can hold hearings focused on OSTP's progress in implementing GAO's priority recommendations, withhold funds when appropriate, or take other actions to provide incentives to act. Moreover, Congress could follow up during the appropriations process and request periodic updates.

Congress also plays a key role in addressing any underlying issues related to the implementation of these recommendations. For example, Congress could pass legislation providing explicit authority to implement a recommendation or requiring certain actions to implement a recommendation.

Copies of this report are being sent to the Director of OMB and the appropriate congressional committees. In addition, the report will be available on the GAO website at [Priority Open Recommendation Letters | U.S. GAO](#).

I appreciate OSTP's continued commitment to these important issues. If you have any questions or would like to discuss any of the issues outlined in this letter, please do not hesitate to contact me or John Neumann, Managing Director, Science, Technology Assessment, and Analytics, at 202-512-6888 or neumannj@gao.gov. Contact points for our Offices of Congressional Relations and Public Affairs may be found on the last page of this report. Our teams will continue to coordinate with your staff on all eight open recommendations. Thank you for your attention to these matters.

⁹GAO, *High-Risk Series: Key Practices to Successfully Address High-Risk Areas and Remove Them from the List*, [GAO-22-105184](#) (Washington, D.C.: Mar. 3, 2022).

¹⁰James M. Inhofe National Defense Authorization Act for Fiscal Year 2023, Pub. L. No. 117-263, div. G, tit. LXXII, subpt. A, § 7211(a)(2), 136 Stat. 2395, 3668 (2022) (codified at 31 U.S.C. § 719 note); *see also* H.R. Rep. No. 117-389, at 44 (2022) (accompanying Legislative Branch Appropriations Act, 2023, H.R. 8237, 117th Cong. (2022)).

Sincerely,

A handwritten signature in black ink that reads "Gene L. Dodaro". The signature is written in a cursive style with a large, prominent "D" and a long horizontal flourish extending to the right.

Gene L. Dodaro
Comptroller General
of the United States

Enclosure

cc: The Honorable Shalanda Young, Director, Office of Management and Budget

Enclosure

Priority Open Recommendations to the Office of Science and Technology Policy

Managing Climate Change Risks

Climate Change: Future Federal Adaptation Efforts Could Better Support Local Infrastructure Decision Makers. [GAO-13-242](#). Washington, D.C.: Apr. 12, 2013.

Year Recommendations Made: 2013

Recommendations: To improve the resilience of the nation's infrastructure to climate change, the Executive Director of the United States Global Change Research Program or other federal entity designated by the Executive Office of the President should work with relevant agencies to (1) identify for decision makers the "best available" climate-related information for infrastructure planning and update this information over time and (2) clarify sources of local assistance for incorporating climate-related information and analysis into infrastructure planning, and communicate how such assistance will be provided over time.

Actions Needed: OSTP neither agreed nor disagreed with these recommendations. According to OSTP officials, the U.S. Global Change Research Program (USGCRP) is developing a Climate Resilience Information System that will provide access to the "best available" climate-related information.¹¹ As of March 2024, OSTP officials said the system continues to be developed. OSTP also stated that, as of March 2024, existing regional science organizations work to provide climate information to regional and local agencies. While we acknowledge the value of such organizations in providing regional climate information, we found in our April 2013 report that no federal entity had comprehensively clarified sources of local assistance for incorporating climate-related information and analysis into infrastructure planning.

To fully address both recommendations, OSTP should provide information demonstrating a government-wide effort to develop and periodically update a set of climate change observations and projections for use in federal decision-making. Federal, state, local, and private sector decision makers could also access it to obtain the best available climate information and sources of local assistance for incorporating this information into infrastructure planning. These actions can serve to improve the resilience of the nation's infrastructure to climate change.

High-risk area: [Limiting the Federal Government's Fiscal Exposure by Better Managing Climate Change Risks](#)

Director: J. Alfredo Gómez, Natural Resources and Environment

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Addressing National Goals through Strategic Planning and Improved Data

¹¹On March 22, 2023, OSTP released a report titled "[Selecting Climate Information to Use in Climate Risk and Impact Assessments: Guide for Federal Agency Climate Adaptation Planners](#)." Further, a report released on March 22, 2023 by the National Science and Technology Council with OSTP involvement titled "[A Federal Framework and Action Plan for Climate Services](#)" provided recommendations and next steps to implement a coherent federal approach to climate services. Should the guidance and recommendations within these reports be implemented over time, it may address elements of this recommendation.

High-Performance Computing: Advances Made Towards Implementing the National Strategy, but Better Reporting and a More Detailed Plan Are Needed. [GAO-21-104500](#). Washington, D.C.: Sept. 30, 2021.

Year Recommendation Made: 2021

Recommendation: The Director of the Office of Science and Technology Policy should address each of the desirable characteristics of a national strategy, as practicable, in the implementation roadmap for the 2020 strategic plan or through other means.¹²

Actions Needed: OSTP concurred with this recommendation. At the time of our report, OSTP officials stated that it would address the desirable characteristics of a national strategy, as practicable, in the upcoming implementation roadmap for the 2020 strategic plan for high-performance computing, with the exception of characteristics that it considers not to be reasonable for inclusion in federal strategies.

The implementation roadmap was issued in May 2022; however, it did not address many of the desirable characteristics of a national strategy, such as performance measures or a process for monitoring and reporting on progress. In June 2024, the National Science and Technology Council, in coordination with OSTP, issued a progress report on the Future Advanced Computing Ecosystem strategic plan. While the report summarized agency efforts taken to address the objectives of the 2020 plan, it did not include changes to the national strategy or the implementation roadmap, such as performance metrics. By addressing such desirable characteristics, OSTP could fully address our recommendation and, as a result, the agencies involved in implementing the 2020 strategic plan can improve their ability to achieve its goals.

Director: Candice Wright, Science, Technology Assessment, and Analytics

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U.S. Manufacturing: Federal Programs Reported Providing Support and Addressing Trends. [GAO-17-240](#). Washington, D.C.: Mar. 28, 2017.

Year Recommendation Made: 2017

Recommendation: To enhance the ability of the Executive Office of the President to implement the Revitalize American Manufacturing and Innovation Act of 2014 requirements related to reporting on advanced manufacturing,¹³ the Director of OSTP, working through the National Science and Technology Council and agency leadership, as appropriate, should identify the information they will collect from federal agencies to determine the extent to which the objectives outlined in the National Strategic Plan for Advanced Manufacturing are being achieved.

Actions Needed: OSTP neither agreed nor disagreed with this recommendation. OSTP stated that a mechanism existed to collect information from federal agencies to determine the extent to

¹²The desirable characteristics of a national strategy we assessed in our report include: (1) organizational roles, responsibilities, and coordination; (2) purpose, scope, and methodology; (3) goals, subordinate objectives, activities, and performance measures; (4) problem definition and risk assessment; (5) resources, investments, and risk management; and (6) integration and implementation.

¹³42 U.S.C. § 6622(c).

which the objectives in the National Strategic Plan for Advanced Manufacturing are being achieved. However, we believe the recommendation is still warranted because OSTP has not identified the information it would need to collect from agencies to measure progress toward the national plan's objectives.

In October 2022, the Subcommittee on Advanced Manufacturing published an updated National Strategy for Advanced Manufacturing.¹⁴ While the strategy does establish a clear linkage between the goals, objectives, and recommendations, it does not include specific metrics or information to be collected to measure achievement of such goals. In March 2024, OSTP stated that the Subcommittee continues to meet regularly to identify and collect information from agencies toward implementation of the National Strategy.

To fully address our recommendation, OSTP should also ensure that the plan identifies specific and measurable information it will collect from agencies to assess progress toward the plan's goals and objectives. Identifying such information will help ensure collection of consistent, comprehensive information with which to measure progress and will enhance reporting on the progress of advanced manufacturing efforts.

Director: Thomas Costa, Education, Workforce, and Income Security

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Advanced Technologies: Strengthened Federal Approach Needed to Help Identify and Mitigate Supply Risks for Critical Raw Materials. [GAO-16-699](#). Washington, D.C.: Sept. 7, 2016.

Year Recommendation Made: 2016

Recommendation: To enhance the ability of the Executive Office of the President to coordinate federal agencies to carry out the national materials policy outlined in the National Materials and Minerals Policy, Research and Development Act of 1980,¹⁵ and to broaden future applications of the early warning screening methodology, the Subcommittee on Critical and Strategic Mineral Supply Chains (now the Subcommittee on Critical Minerals) should take the steps necessary to include potentially critical materials beyond minerals, such as developing a plan or strategy for prioritizing additional materials for which actions are needed to address data limitations.

Actions Needed: OSTP neither agreed nor disagreed with our recommendation. OSTP stated that it saw the value in analyzing more minerals and non-minerals to help inform policy decisions but that fulfilling this need would require additional dedicated personnel and financial resources. In March 2024, OSTP provided several examples of agency activities related to critical minerals or materials data collection and assessments. However, as of March 2024, OSTP had not provided information on the development of a plan or strategy to address data limitations for materials other than minerals, including assessing data limitations for materials that may not be covered by individual agencies' efforts.

To fully address our recommendation, OSTP should work with subcommittee member agencies and other relevant interagency working groups to develop a plan to coordinate federal efforts and resources to address data limitations. For example, OSTP could work with other agencies to collect data on the quantity of materials consumed for the production of advanced

¹⁴National Science and Technology Council, *National Strategy for Advanced Manufacturing: A Report by the Subcommittee on Advanced Manufacturing, Committee on Technology* (Oct. 2022).

¹⁵30 U.S.C. §§ 1602–1604.

technologies both in the United States and globally. Doing so would enhance agencies' ability to assess other potentially critical materials, in addition to minerals, and could help to more fully implement the requirements of the Energy Act of 2020.¹⁶

Director: Candice Wright, Science, Technology Assessment, and Analytics

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Critical Minerals: Building on Federal Efforts to Advance Recovery and Substitution Could Help Address Supply Risks. [GAO-22-104824](#). Washington, D.C.: Jun. 16, 2022.

Year Recommendation Made: 2022

Recommendation: The Secretary of Energy, the Secretary of the Interior, and the Director of the Office of Science and Technology Policy, in collaboration with the members of the Critical Minerals Subcommittee, should update the 2019 critical minerals national strategy as it relates to recovery and substitution. The update should address newly enacted statutory requirements and recent federal efforts and incorporate characteristics of effective national strategies, including (1) goals, subordinate objectives, activities, and performance measures; (2) resources, investments, and risk management; and (3) integration and implementation.

Actions Needed: OSTP neither agreed nor disagreed with this recommendation. As of March 2024, OSTP officials said the existing national strategy provides a useful framework for interagency collaboration and the effort required to produce a new document would take time and attention away from executing the important work underway. However, our recommendation is to update the strategy, such as by establishing priorities, time frames, and performance measures. We continue to believe updating the current national strategy is important to be consistent with leading practices for effective national strategies. Updating the strategy could also enhance efforts to address the cross-cutting challenges that currently constrain efforts to advance critical minerals recovery and substitution in the U.S. and improve the strategy's usefulness to congressional and agency decision makers.

Director: J. Alfredo Gómez, Natural Resources and Environment

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Regulating Artificial Intelligence

Artificial Intelligence: Agencies Have Begun Implementation but Need to Complete Key Requirements. [GAO-24-105980](#). Washington, D.C.: Dec. 12, 2023.

Year Recommendation Made: 2024

Recommendation: The Director of the Office of Science and Technology Policy should communicate a list of federal agencies that are required to implement the Regulation of AI

¹⁶Energy Act of 2020, within Consolidated Appropriations Act, 2021, Pub. L. No. 116-260, div. Z, title VII, §§ 7001–7003, 134 Stat. 1182, 2561–2578 (2020) (codified at 42 U.S.C. § 13,344, 30 U.S.C. § 1606, 50 U.S.C. § 3372).

Applications memorandum requirements (M-21-06) to inform agencies of their status as implementing agencies with regulatory authorities over AI.¹⁷

Actions Needed: OSTP did not agree with this recommendation. According to OSTP officials, while Executive Order 13859, *Maintaining American Leadership in Artificial Intelligence*, states that implementing agencies are determined by OSTP and the Select Committee on AI, the Executive Order does not state that OSTP must communicate that designation to agencies.¹⁸ However, some agencies stated that they were unaware of their designation, and therefore not certain of their requirements under the memorandum. Thus, we continue to believe that full implementation of this recommendation is warranted so that agencies are able to complete requirements related to the Executive Order. To fully implement this recommendation, OSTP needs to inform agencies of their status as implementing agencies. Doing so would strengthen agencies' efforts to proactively prepare for AI complexities, benefits, and risks.

Director: Kevin Walsh, Information Technology and Cybersecurity

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Addressing Research Security Risks

Research Security: Strengthening Interagency Collaboration Could Help Agencies Safeguard Federal Funding from Foreign Threats. [GAO-24-106227](#). Washington, D.C.: Jan. 11, 2024.

Year Recommendation Made: 2024

Recommendation: As part of OSTP's ongoing efforts to address research security risks, the Director of OSTP, in coordination with federal research and development awarding agencies, should facilitate the sharing of information on identifying foreign ownership, control, or influence. This could occur, for example, in conjunction with OSTP's existing efforts to support the national security strategy or its existing role to enhance the federal research agencies' awareness of research security risks and policies under National Security Presidential Memorandum 33.¹⁹

Actions Needed: OSTP agreed with our recommendation. To fully implement this recommendation, OSTP needs to proactively share information on identifying foreign ownership, control, or influence across agencies, as we found in our report. By bringing together federal awarding agencies to share information on identifying foreign ownership, OSTP could help facilitate a more consistent and effective approach to safeguarding U.S. research and development from foreign entities of concern.

Director: Candice Wright, Science, Technology Assessment, and Analytics

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¹⁷OMB, *Guidance for Regulation of Artificial Intelligence Applications*, M-21-06 (Washington, D.C.: Nov. 17, 2020).

¹⁸The White House, *Maintaining American Leadership in Artificial Intelligence*, Exec. Order 13859 (Washington, D.C.: Feb. 11, 2019).

¹⁹*National Security Personnel Memorandum 33, Presidential Memorandum on United States Government-Supported Research and Development National Security Policy*, Jan. 2021.