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Comptroller General
of the United States

July 22, 2022

The Honorable Alondra Nelson
Acting Director
Office of Science and Technology Policy
1650 Pennsylvania Ave. NW
Washington, DC 20501

Priority Open Recommendations: Office of Science and Technology Policy

Dear Acting Director Nelson:

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 personal attention to areas where open recommendations should be given high priority.[1] In November 2021, we reported that, on a government-wide basis, 76 percent of our recommendations made 4 years ago were implemented.[2] OSTP's recommendation implementation rate was 40 percent, reflecting implementation of two of five recommendations made in two fiscal year 2018 reports. As of July 2022, OSTP had 13 open recommendations. Fully implementing these open recommendations could significantly improve OSTP's operations.

Of the 13 open OSTP recommendations, three were included in our initial July 2021 priority recommendation letter to OSTP. Those three recommendations have not yet been fully implemented, and we ask that you direct your attention to these recommendations, which are included in this letter. We are also adding five recommendations as priority this year. These are related to identifying and using the "best available" climate information in infrastructure decision making to manage climate change risks as well as tracking progress toward national goals with respect to high-performance computing and advanced manufacturing. These additional five recommendations bring the total number of priority recommendations to eight of the total of 13 open OSTP recommendations. (See the enclosure for the list of recommendations and actions needed to implement them.)

OSTP's eight priority recommendations fall into the following three areas.

1. Strengthening interagency coordination. OSTP plays a critical role in bringing agencies together under the committees and subcommittees of the National Science and Technology Council. Our prior work has shown that issues in science and technology cut across multiple

[1]Priority 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 operation, for example, by realizing large dollar savings; eliminating mismanagement, fraud, and abuse; or making progress toward addressing a high-risk or duplication issue.

[2]GAO, *Performance and Accountability Report: Fiscal Year 2021*, GAO-22-4SP (Washington, D.C.: Nov. 15, 2021).

agencies. We have three priority recommendations in this area, which are focused on strengthening interagency collaboration on science and technology issues. Two of the recommendations call for fully implementing leading collaboration practices, such as defining and articulating a common outcome; agreeing on roles and responsibilities; and developing mechanisms to monitor, evaluate, and report on results. The third recommends OSTP develop a plan to address data limitations for potentially critical materials. For example, OSTP could work with other agencies to collect data on the quantity of materials consumed for the production of advanced technologies both in the United States and globally. By fully implementing these three recommendations, OSTP could help agencies enhance and sustain coordination on an administration's research and development priorities as well as address cross-cutting science and technology issues.

2. 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. One recommendation 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.[3]

3. Tracking progress toward national goals. OSTP provides leadership to agencies in working together to try and address a variety of national goals. In our prior work we have emphasized the importance of effective performance management to help the federal government more effectively implement programs and deliver services. Congress and the Executive Branch developed a framework that provides tools to help address significant financial, management, and performance challenges.[4] This framework, among other things, calls for establishing various government-wide and agency-specific performance goals, and assessing progress in achieving goals and objectives through performance reviews.

We have three priority recommendations that, if implemented, would help agencies better adhere to elements of the framework by improving how they track progress toward achieving national goals in the areas of high-performance computing and advanced manufacturing. Specifically, we recommended that OSTP address characteristics of a national strategy, as practical, such as identifying the resources needed to implement it and establishing performance measures and a process for monitoring and reporting on progress, in implementing the 2020 high-performance computing strategic plan. We also recommended OSTP (1) prepare annual reports assessing progress made in implementing the 2020 strategic plan, and (2) identify information to collect from federal agencies to determine whether the objectives outlined in the National Strategic Plan for Advanced Manufacturing are being achieved.

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[3]*See*, Infrastructure Investment and Jobs Act, Pub. L. No. 117-58, §§ 25013 and 90008, 135 Stat. 429, 868, and 1349 (2021) (to be codified at 49 U.S.C. 5506(e)(3), and 47 U.S.C. § 921 (note).

[4]*See*, Government Performance Results Act of 1993 (GPRA), which was significantly enhanced by the GPRA Modernization Act of 2010 (GPRAMA), Pub. L. No. 103-62, 107 Stat. 285 (1993 and Pub L. No. 111-352, 124 Stat. 3866 (2011), (codified at 31 U.S.C. § 1115-25).

In March 2021, we issued our biennial update to our High-Risk List, which identifies government operations with greater vulnerabilities to fraud, waste, abuse, and mismanagement or the need for transformation to address economy, efficiency, or effectiveness challenges.[5] One of our high-risk areas—limiting the federal government's fiscal exposure by better managing climate change risks—is shared among multiple agencies, including OSTP.

Several other government-wide high-risk areas may 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) ensuring the cybersecurity of the nation,[6] and (4) improving government-wide personnel security clearance processing. 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, and the leadership and staff in agencies, 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 your office continues to make progress to address high-risk issues.[7]

Copies of this report are being sent to the Director of the Office of Management and Budget and appropriate congressional committees including the Committees on Appropriations; Budget; Commerce, Science, and Transportation; and Homeland Security and Governmental Affairs, United States Senate, and the Committees on Appropriations; Budget; Oversight and Reform; and Science, Space, and Technology, House of Representatives. In addition, the report will be available on the GAO website at http://www.gao.gov.

[5]GAO, *High-Risk Series: Dedicated Leadership Needed to Address Limited Progress in Most High-Risk Areas*, GAO-21-119SP (Washington, D.C.: Mar. 2, 2021).

[6]With regard to cybersecurity, we also urge you to use foundational information and communications technology supply chain risk management practices set forth in our December 2020 report: GAO, *Information Technology: Federal Agencies Need to Take Urgent Action to Manage Supply Chain Risks*, GAO-21-171 (Washington, D.C.: Dec. 15, 2020).

[7]GAO, *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).

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 of the 13 open recommendations. Thank you for your attention to these matters.

Sincerely yours,

Gene L. Dodaro
Comptroller General
Of the United States

Enclosure(s) – 1

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

Enclosure

Priority Open Recommendations to the Office of Science and Technology Policy (OSTP)

1. Strengthening Interagency Collaboration

Federal Research: Additional Actions Needed to Improve Public Access to Research Results. GAO-20-81. Washington, D.C.: Nov. 21, 2019.

Recommendation: As the Subcommittee on Open Science moves forward, the Office of Science and Technology Policy co-chair, in coordination with other co-chairs and participating agencies, should take steps to fully implement leading practices that enhance and sustain collaboration.

Actions Needed: OSTP initially disagreed with the recommendation, stating that the Subcommittee had already taken steps to implement the leading practices that can help to enhance and sustain interagency collaboration identified in our report. However, according to OSTP, the Subcommittee has been reorganizing its working groups around current administration priorities and, as of May 2022, is taking additional steps that are responsive to this recommendation, including updating its charter. To fully address our recommendation, OSTP should work with Subcommittee member agencies to implement the leading practices we identified and provide information on how the Subcommittee's efforts incorporate these practices. Implementing these practices can help agencies better marshal their collective efforts to support public access to research results.

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

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Science and Technology: Considerations for Maintaining U.S. Competitiveness in Quantum Computing, Synthetic Biology, and Other Potentially Transformational Research Areas. GAO-18-656. Washington, D.C.: Sept. 26, 2018.

Recommendation: As the Subcommittee on Quantum Information Science moves forward, the Office of Science and Technology Policy co-chair, in coordination with other co-chairs and participating agency officials, should take steps to fully implement leading practices that enhance and sustain collaboration.

Actions Needed: OSTP agreed with the recommendation but expressed some concerns about required resources. As of May 2022, OSTP has worked with the other Subcommittee co-chairs to implement the recommendation, including by creating interagency groups and a series of strategic documents to support work under six areas identified in a September 2018 National Strategic Overview for Quantum Information Science.

The National Quantum Initiative Act was enacted in 2018, after our report was issued. It created the National Quantum Coordination Office and requires a National Quantum Initiative Supplement to the President's FY2022 Budget which, according to OSTP, serves as the main mechanism for reporting on results, including efforts under the policy areas identified in the September 2018 national strategic overview. These efforts represent important steps toward implementing certain leading collaboration practices such as establishing mutually reinforcing or joint strategies. However, it is less clear how these efforts address other leading collaboration

practices, such as agreeing on roles and responsibilities. To fully address our recommendation, OSTP should work with the Coordination Office, and the Subcommittee co-chairs to implement the leading practices we identified. Doing so will help to strengthen interagency collaboration to maintain U.S. competitiveness in quantum computing.

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

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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.: Sep. 7, 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, 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 May 2022, OSTP stated that multiple interagency working groups, including the Subcommittee and the Executive Order 14,017 Working Group, continue to address critical materials issues relevant to our recommendation. OSTP provided several examples of interagency activities related to critical minerals data collection and mapping. However, OSTP did not provide any examples of activities focused on addressing data limitations for materials other than minerals.

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. Doing so will enhance agencies' ability to assess other potentially critical materials, in addition to minerals.

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

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2. 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.

Recommendation: 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 identify for decision makers the "best available" climate-related information for infrastructure planning and update this information over time.

Actions Needed: The Director of OSTP did not comment on this recommendation. According to officials from OSTP, 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. The officials noted that USGCRP will begin roll-out of this system by the end of 2022. To fully address our recommendation, 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, which federal, state, local, and private sector decision makers could also access to obtain the best available climate information. These actions can serve to improve the resilience of the nation's infrastructure to climate change.

Recommendation: 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 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: The Director of OSTP did not comment on this recommendation. In May 2022, OSTP reiterated previously provided information that existing regional science organizations work to provide climate information to regional and local agencies. We acknowledged the value of such organizations in providing regional climate information in our report. However, we reported that no federal entity had comprehensively clarified sources of local assistance for incorporating climate-related information and analysis into infrastructure planning.

To fully address our recommendation, 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, which federal, state, local, and private sector decision makers could also access 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.

Director: J. Alfredo Gómez, Natural Resources and Environment

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3. Tracking Progress toward National Goals

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.

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.[8]

[8]The 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; (6) integration and implementation.

Actions Needed: OSTP concurred with this recommendation. 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 does not address many of the desirable characteristics of a national strategy, such as performance measures or a process for monitoring and reporting on progress. To fully address our recommendation, OSTP should use its flexibility to address the six desirable characteristics of a national strategy to the extent practicable in the implementation roadmap for the 2020 strategic plan, in future iterations of the strategic plan, or through other means. By doing so, the agencies involved in implementing the 2020 strategic plan can improve their ability to achieve its goals.

Recommendation: The Director of the Office of Science and Technology Policy, in consultation with the 10 National Strategic Computing Initiative agencies, should prepare publicly available annual reports assessing progress made in implementing the 2020 strategic plan on the future advanced computing ecosystem.

Actions Needed: OSTP concurred with this recommendation. OSTP officials stated that it will publish an annual report on progress toward implementing the 2020 strategic plan for high-performance computing. To fully address our recommendation, OSTP should provide evidence that it has prepared publicly available annual reports on progress implementing the 2020 strategic plan. Such information could 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.

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.

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, the Director of the Office of Science and Technology Policy, 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 did not state whether it agreed or disagreed with this recommendation. OSTP stated that a mechanism existed to collect information from federal agencies to determine the extent to 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. As of May 2022, OSTP stated that the next version of the strategic plan is being developed, and will include goals and objectives as well as incorporate metrics.

To fully address our recommendation, OSTP should also ensure that the plan identifies the information it will collect from agencies to measure progress using the plan's metrics. 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.

Acting Director: Dawn Locke, Education, Workforce, and Income Security

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