SCIENCE AND TECHNOLOGY:

GAO'S SUPPORT FOR CONGRESS

MARCH 2025 UPDATE

GAO
U.S. GOVERNMENT
ACCOUNTABILITY OFFICE

MARCH 2025
GAO-25-107724

EXECUTIVE SUMMARY

GAO has delivered reliable, nonpartisan information on science and technology for decades. Beginning in 2019, we rapidly expanded our science and technology expertise. We now provide comprehensive products and services to meet almost any congressional S&T need.

OVER 90 consultations in 2024

QUICK-TURNAROUND CONSULTATION

Fast analysis for Members, in as little as 24 hours. Includes reviewing draft legislation, analyzing data, and preparing for hearings.

32 Since 2019

7 in progress

TECHNOLOGY ASSESSMENTS

Deep dives on emerging technology, framing the key issues for policymakers.

67 Since 2019

AUDIT REPORTS

Evaluations of federal agency S&T programs, with recommendations for improvement.

53 AS OF February 2025

SHORT-TERM REPORTING

Two-page Science & Tech Spotlights, done in 3 months.

We continue to expand our S&T services to Congress. For example:

S&T NETWORKING

We are enhancing our process to facilitate congressional access to S&T experts, in both academia and industry. We are also growing our already extensive network of such experts.

HORIZON SCANNING

We are committed to providing insight into technologies that could have significant impacts on Americans in the long term. We issued our first *On the Horizon* report in November 2024.

EXECUTIVE SUMMARY

Here are some of the ways we ensure a strong foundation for our S&T products and services.

STAFF EXPERTISE

The staffing of our science and technology team increased from 49 in 2019 to a projected 175 in 2025. These staff collectively hold more than 100 advanced degrees, including 42 PhDs, with expertise in areas such as microbiology, materials chemistry, and aerospace engineering. We have also expanded staffing in several other GAO teams, including our information technology and cybersecurity team.

CONGRESSIONAL OUTREACH

To ensure all congressional staff can access our expertise, we stay in routine touch with relevant committees and all interested staff, including over a dozen committees with an interest in S&T. A new initiative is a program in which GAO senior officials serve as "ambassadors" to individual Members who are neither committee nor subcommittee chairs or ranking members. In addition, we recently launched an ongoing series of expert presentations at the Longworth House Office Building, which were attended by staff from 14 committees and 50 Member offices.

THE INNOVATION LAB

With a staff of 15, our Innovation Lab develops new data science tools. It also provides hands-on expertise for our reporting on artificial intelligence (AI) and other emerging technologies. Its products include a range of use cases for AI within GAO and an AI Accountability Framework for the federal government.

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Abbreviations

AI	Artificial Intelligence	**ITC**	Information Technology and Cybersecurity
DHS	Department of Homeland Security	**NAPA**	National Academy of Public Administration
GSA	General Services Administration	**S&T**	Science and Technology
IoT	Internet of Things	**STAA**	Science, Technology Assessment, and Analytics

A MESSAGE FROM STAA'S MANAGING DIRECTOR AND GAO'S CHIEF SCIENTIST

Congress has a substantial interest in science and technology (S&T), which powers the U.S. economy and touches every part of the federal government. To take one prominent example, artificial intelligence (AI) could transform virtually all sectors of American life, as well as introduce both efficiencies and risks at federal agencies. Similarly, gene editing could lead to new cures, as well as complicate the work of agencies overseeing health care. Congress needs reliable and timely information to understand and respond to the implications of such emerging technologies for society and for the federal government's finances.

GAO provides—as it has for more than 100 years—objective, nonpartisan analysis to Members of Congress and their staff. We continue to place a high priority on science and technology and have been building our capacity for the past two decades. In 2019, we increased our investment by creating and greatly expanding a new team that specializes in S&T. Such improvements position us to provide considerably broader and deeper support amid accelerating technological change, in the form of products and services that are useful to Congress.

This report details GAO's substantial and growing S&T capacity and our plans to continually improve our support for Congress. It also responds to a request to update Congress on how GAO has closed four gaps in congressional S&T support that were identified in 2019 by the National Academy of Public Administration (NAPA). In addition, this report outlines our vision to further enhance Congress's access to information on key emerging issues, to world-class experts, and to the benefits of advanced technological tools, all backed by GAO's rigorous standards for reliability and independence.

Our purpose at GAO is nonpartisan service to Congress. We look forward to furthering this purpose with respect to science and technology, as in all areas affecting the interests of the American people.

JOHN NEUMANN
MANAGING DIRECTOR
Science, Technology Assessment, and Analytics

STERLING THOMAS, PhD
CHIEF SCIENTIST
Government Accountability Office

BACKGROUND

For decades, GAO has published reports on science and technology issues. We have also recognized S&T issues as critical to the nation and have included them as a key element of our strategic framework. For that reason, we have for many years been building expertise in several aspects of S&T. For more than 40 years, we have had an organizational team dedicated to information technology. This team issued numerous reports on cybersecurity and changed its name to Information Technology and Cybersecurity in 2019. In 2002, we began conducting technology assessments, a form of reporting pioneered by a previous congressional agency, the Office of Technology Assessment, which Congress defunded in fiscal year 1996. In 2008, we hired our first Chief Scientist.

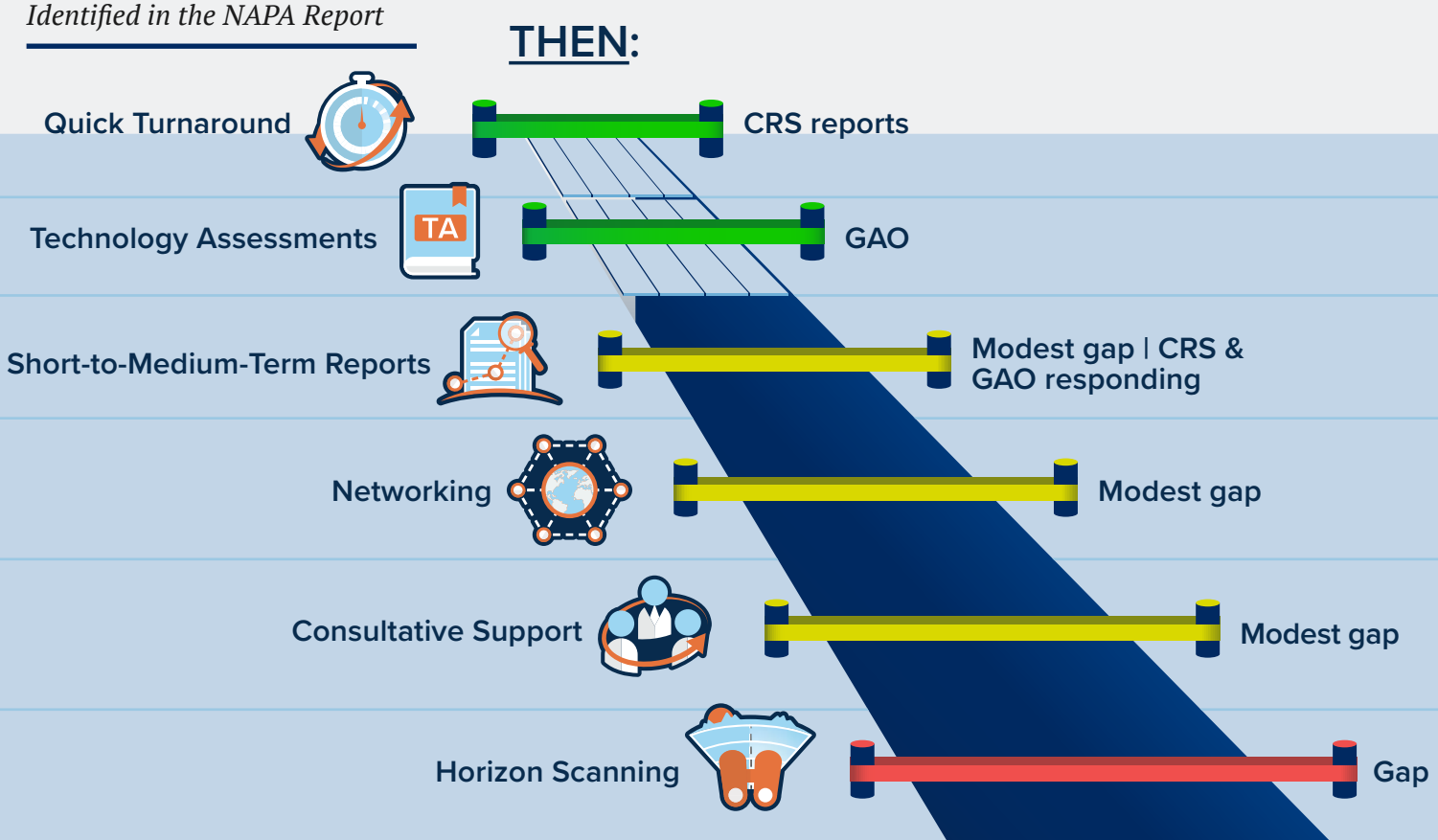
We intensified these efforts in January 2019 with support from the Congress, establishing a new organizational team, known as Science, Technology Assessment, and Analytics (STAA).

In March 2019, GAO provided the House and Senate Subcommittees on Legislative Branch Appropriations with our Science and Technology Reorganization Plan.[1] It described how we would build on our existing capabilities to meet congressional needs for objective and robust S&T support. This plan outlined:

- The organizational structure of STAA
- Plans for STAA's staffing, resources, and areas of expertise
- The products and services that STAA would provide to Congress and
- The governance structures that would apply to STAA's work.

In October 2019, in response to concerns about gaps in S&T support to Congress, NAPA issued a report evaluating the capacity of legislative support agencies, focusing on GAO and the Congressional Research Service. The 2019 NAPA report included an analysis of six types of congressional S&T support and identified

2019 S&T Support for Congress Identified in the NAPA Report

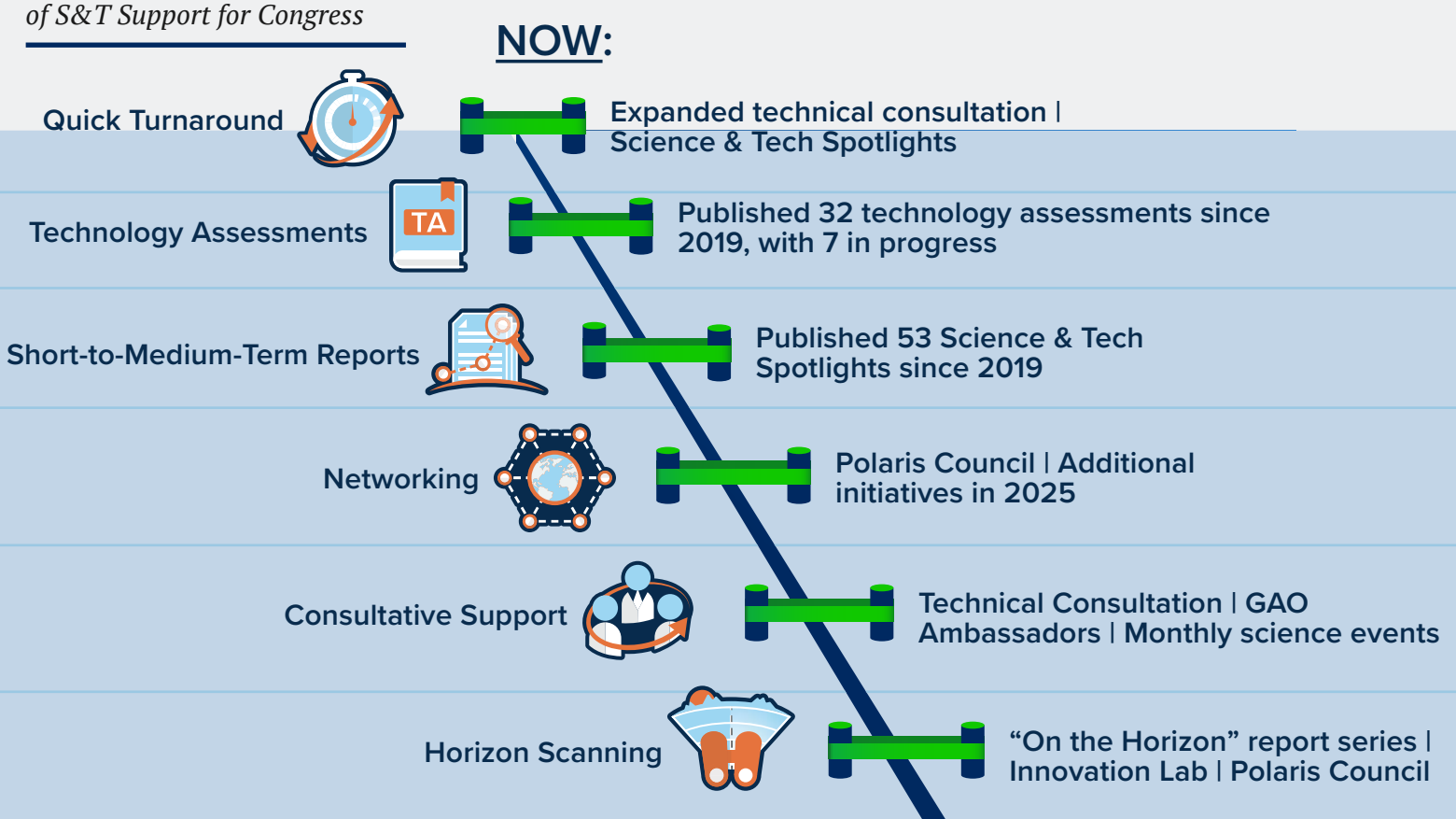


gaps in four of these (see below).[2]
NAPA presented the following options for addressing the four gaps: 1) enhance existing entities, 2) create a new agency, and 3) enhance existing entities and create an advisory office. NAPA recommended the third option, suggesting that GAO further develop the capability of STAA to meet some of the gaps in S&T support identified, such as technology assessments, short-to-medium-term reports, and networking. Later that year, GAO's Chief Scientist testified alongside a co-author of the NAPA before the House Science, Space, and Technology Committee. He detailed planned actions to enhance GAO's S&T efforts originally outlined in the March 2019 Science and Technology Reorganization Plan, which aligned closely with the congressional needs identified in the NAPA report.[3]

More recently, STAA issued a report in September 2022 that described the development of the team, and how it uses its interdisciplinary S&T expertise to respond to congressional requests and information needs.[4] In addition, congressional S&T support has been a long-standing element of GAO's
strategic plan.

This report details how we have further expanded our S&T support and substantially closed the gaps that NAPA identified (see figure below). It also responds to provisions included in the committee reports accompanying the Legislative Branch Appropriations for Fiscal Year 2025. The House report included a provision for GAO to report on efforts to bridge the gaps identified in the 2019 NAPA report. The Senate report included a provision to update STAA's comprehensive plan to reflect current science, technology, and analytics requirements and to provide recommendations for enhancing, as necessary, GAO's capacity to provide support to Congress to meet these new requirements. This report describes (1) how GAO has expanded its science and technology products and services; (2) how GAO combines its policy knowledge with S&T expertise to meet science, technology, and analytics requirements to support Congress; and (3) how GAO will help Congress prepare for tomorrow's S&T challenges. ✦

2025 GAO's Expanded Offering of S&T Support for Congress

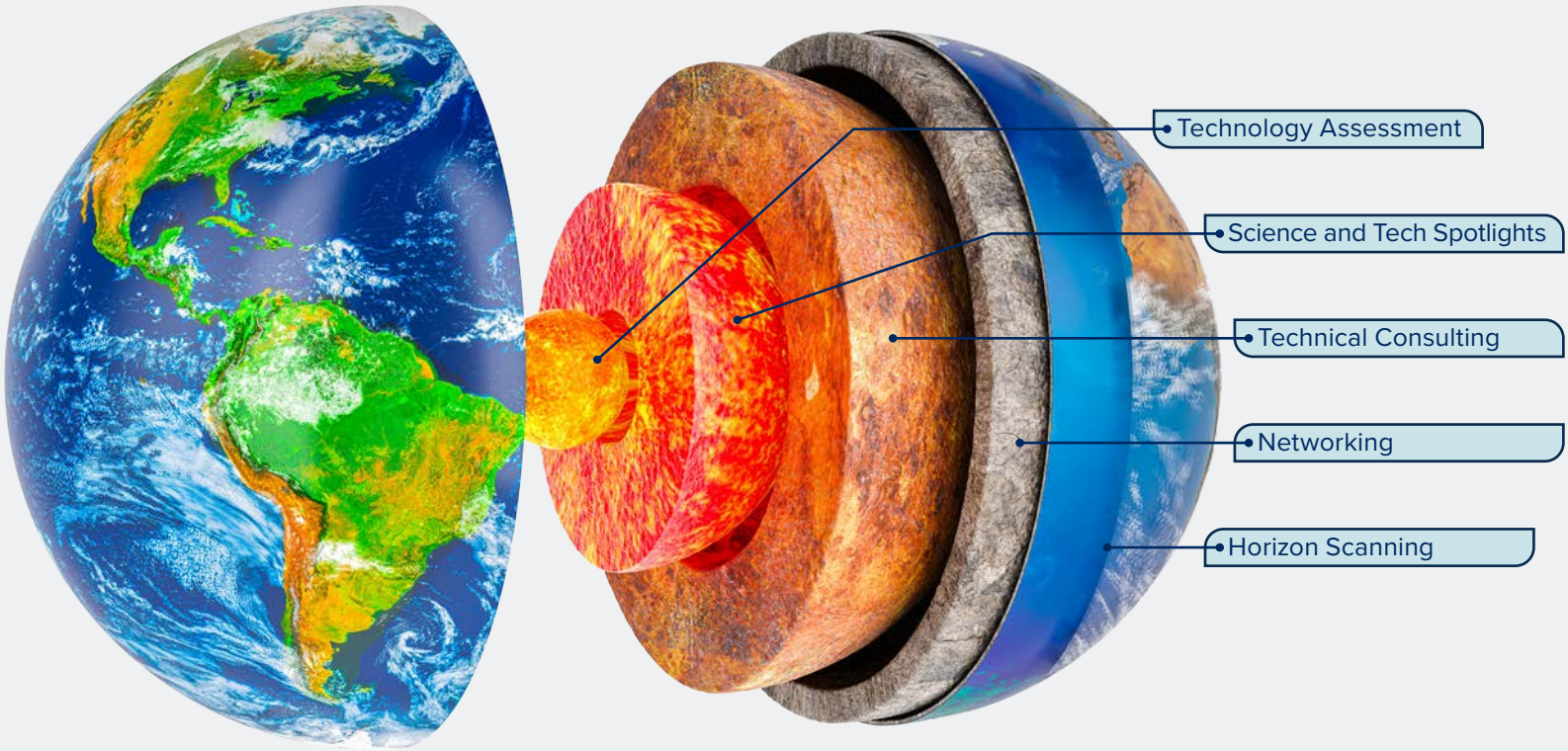


SECTION 1

EXPANDING SCIENCE AND TECHNOLOGY PRODUCTS AND SERVICES

Given the growing importance of science and technology (S&T), GAO has expanded and continues to expand S&T capabilities and services to Congress. This section highlights three elements of this expansion. First, we have intensified outreach to ensure congressional staff are aware of our products and services, and that we are aware of congressional S&T priorities. Second, we have grown our portfolio of reliable, nonpartisan products to ensure we meet congressional timelines and address critical S&T topics. Third, we have increased our technical consultations with Members and their staffs on S&T issues. These actions address two of the four congressional support gaps identified in the 2019 NAPA report: short-to-medium-term reports and consultative support. The other two gaps are addressed in later sections. ✦

GAO's Science and Technology Products and Services



EXPANDING OUTREACH TO ENSURE WE MEET CONGRESSIONAL NEEDS

To ensure we are responsive to Congress and the rapidly changing S&T landscape, STAA and other GAO teams have increased outreach to congressional committees and Members. Specifically, STAA conducts biannual outreach to numerous congressional committees, including but not limited to all committees with jurisdiction over S&T. STAA senior officials and GAO's Chief Scientist met (collectively or separately) with 15 committees, six Members, and the staff of 39 Members during fiscal years 2023 and 2024. In 2024, STAA also initiated quarterly meetings with a science committee for which we conducted a large volume of work.

This outreach increases committee and Member awareness of upcoming publications and allows for an exchange of ideas for future reports and services. As of February 2025, we have responded to every congressional request on S&T. We will strive to accept all future requests, consistent with our congressional protocols (which, among other things, require us to prioritize certain requests).

We conduct additional outreach at the beginning of each Congress to ensure new Members and staff are aware of our role and our services. For example, for the 118th Congress, STAA contacted the offices of all new Members, then followed up with individualized outreach that aligned with their new committee portfolios. STAA is in the process of doing the same for the 119th Congress. ✦

INCREASING REPORTING ON URGENT AND CRITICAL S&T ISSUES

GAO's combination of reliability, nonpartisanship, and policy insight make it a crucial resource for Congress. We are committed to increasing our value to Congress and have therefore increased S&T staffing levels. This increase has allowed us to grow our portfolio of S&T work and ensure it matches all areas of congressional interest.

INTERACTIVE
Select a Science and Technology portfolio category to see a sample of recent GAO releases

RESET

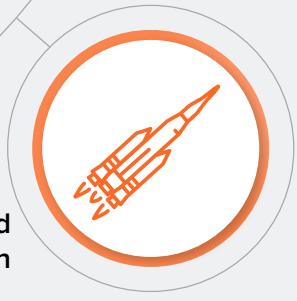
Biomedical and Health Innovations

Federal Science Oversight

Computing and Communications

Energy, Environment, and Agriculture

Defense and Homeland Security



Space and Transportation

Links to all publications available in Appendix I & II

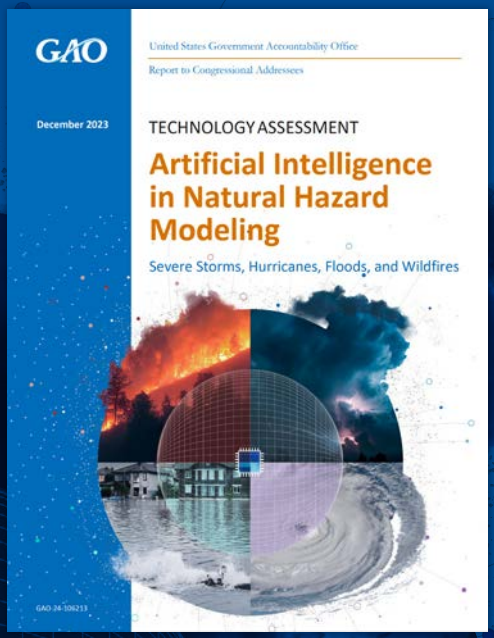
The following describes our portfolio of S&T products, how we have accelerated their production since 2019, and how we plan to continue to expand.

TECHNOLOGY ASSESSMENTS: For over two decades, we have published technology assessments, which the 2019 NAPA report identified as an important element of congressional S&T support. Since 2019, STAA has published **32 of these in-depth reviews** of critical technologies and their future implications for the nation, with an additional nine underway as of February 2025. In calendar year 2024, STAA issued six technology assessments, including two on generative artificial intelligence (AI), as well as assessments on critical minerals, air quality sensors, wind energy, and precision agriculture. Earlier assessments covered critical S&T issues such as regenerative medicine, the environmental effects of large satellite constellations, and AI in natural hazard modeling, drug development, and medical diagnostics.

CLOSER LOOK

ASSESSING THE LATEST TECHNOLOGY

Artificial Intelligence in Natural Hazard Modeling: STAA reported that machine learning is being applied to improve and speed up forecasting of severe storms, hurricanes, floods, and wildfires. But the technology faces data limitations and lack of trust. We offered 5 policy options to help address such challenges such as closing data gaps that can reduce accuracy in rural areas.

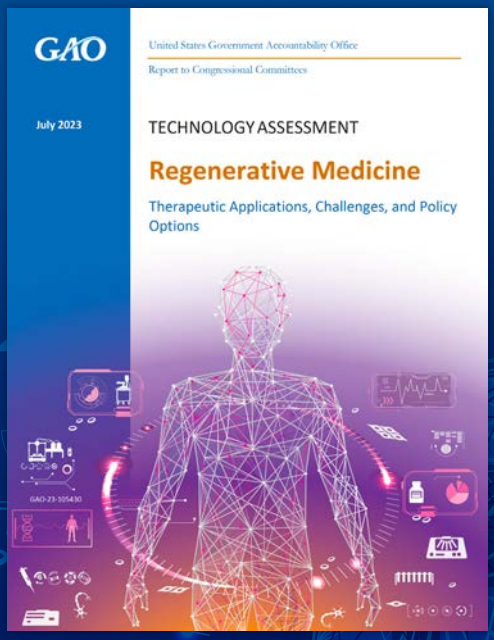


GAO-24-106213
Artificial Intelligence in Natural Hazard Modeling: Severe Storms, Hurricanes, Floods, and Wildfires

CLOSER LOOK

ASSESSING THE LATEST TECHNOLOGY

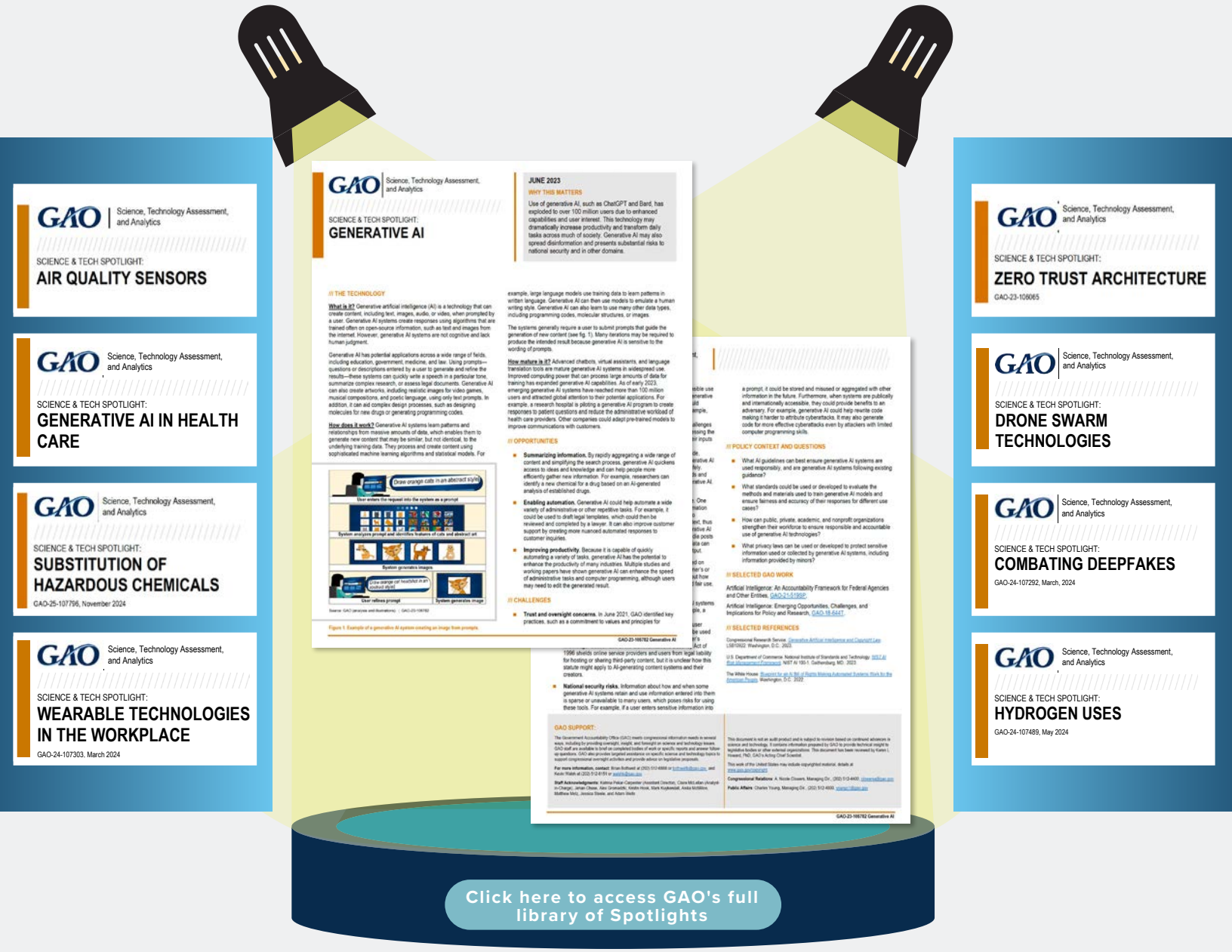
Regenerative Medicine: In a 2023 technology assessment, STAA reported on an emerging technology that aims to cure challenging conditions by restoring or replacing human cells, tissues, or organs affected by disease. The report offered 11 policy options policymakers could consider to help advance this technology, as well as considerations when evaluating each option. For example, policymakers could help smaller companies get better access to regulatory experts in the federal government.



GAO-23-105430
Regenerative Medicine: Therapeutic Applications, Challenges, and Policy Options

We often conduct technology assessments on our own initiative so that we can anticipate the needs of multiple committees on emerging issues. For example, we published a 2023 technology assessment on fusion energy, aiming to serve four committees and an additional eight individual Members who expressed interest. Similarly, a 2021 technology assessment on quantum computing and communications was addressed to four committees and four individual Members. To better meet Congress's need for medium-term reports (part of a gap NAPA identified in 2019), STAA recently has made changes to support the faster issuance of more concise technology assessments on topics such as generative AI development, wearable technologies, and weather modification technologies.

SCIENCE & TECHNOLOGY SPOTLIGHTS: Soon after the launch of STAA, we recognized the need to accelerate our work and better meet Congress's need for short-term reports on S&T. Around the same time, NAPA reported that Congress was facing a gap in short-term reporting. In 2019, we introduced Science & Tech Spotlights, which are two-page summaries that are typically developed in 3 months and report on emerging S&T topics and the policy questions they raise. Since 2019, we have issued **53 Science & Tech Spotlights** on topics such as hydrogen energy, combating deepfakes, drone swarms, and directed energy weapons. Reflecting the broad importance of S&T in public policy, STAA and the Information Technology and Cybersecurity (ITC) team worked jointly to produce Spotlights on generative AI and zero trust architecture, and STAA worked with the Natural Resources and Environment team to produce a Spotlight on air quality sensors.



PERFORMANCE AUDITS: We also conduct performance audits, which help to ensure that federal agencies manage and fund their programs effectively and assist Congress in its oversight responsibilities. These products help Congress and the public more deeply understand S&T issues. For example, since 2018, ITC, STAA, and other teams have issued over **60 audit reports** covering the use of AI in the federal government, as well as the wider societal implications of the technology. A large majority of such audits are in response to congressional requests and legislative mandates, which take priority over self-initiated work.

Since 2019, STAA has issued **67 audit reports on S&T** more broadly—23 of which were issued in fiscal year 2024. These audits made 210 recommendations, 194 of which agencies concurred with, and 94 of which they have implemented.[5] This body of work is critical in supporting congressional oversight of federal agencies and complements our technology assessments and other S&T products and services. Through audits of federal S&T activities, STAA covers the full life cycle of discovery and innovation, from basic research to manufacturing and commercialization. S&T audits also address issues such as intellectual property protections and enhanced competitiveness. Specifically, they evaluate:

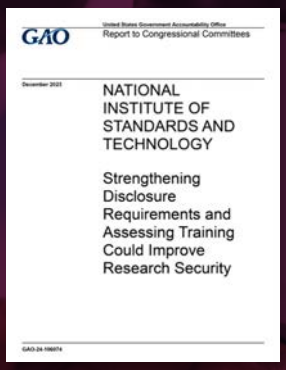
- Agencies' management and coordination of federal research and development
- Agencies' efforts to address crosscutting federal research and development challenges, including S&T workforce challenges
- Federal efforts to address key intellectual property issues and administration of the patent and trademark system
- Federal efforts to support U.S. competitiveness in the global innovation economy

CLOSER LOOK

MONITORING RESEARCH SECURITY

Since 2019, STAA has issued 8 reports on research security and the risk of foreign influence in research that could affect U.S. competitiveness with countries such as China. These reports focused on key science agencies, such as the National Institute of Standards and Technology, the Office of Science and Technology Policy, the National Institutes of Health, and the National Science Foundation. This body of work supported 15 congressional committees and produced 23 recommendations for executive branch agencies. Below are a few examples of this work.

GAO-24-106227
Research Security: Strengthening Interagency Collaboration Could Help Agencies Safeguard Federal Funding from Foreign Threats



GAO-24-106074
National Institute of Standards and Technology: Strengthening Disclosure Requirements and Assessing Training Could Improve Research Security

In addition, STAA, in collaboration with other teams, conducts technical performance audits on topics such as the nation's nuclear stockpile, biosafety and biosecurity, and federal lab testing and drug identification.

We have also shortened issuance timelines for performance audits when appropriate to increase our responsiveness to congressional needs. For example, STAA issued a report in 3 months on considerations for a federal digital services academy based on a roundtable discussion of experts convened by GAO. This approach allowed for timely response to critical questions about training an S&T workforce and provided Congress with perspectives from a range of experts. Similarly, we completed a technical audit in 9 months, in which we purchased a range of over-the-counter prenatal supplement brands and had them tested to see if they contained the labeled amounts of nutrients.

CLOSER LOOK

TESTING PRENATAL SUPPLEMENTS

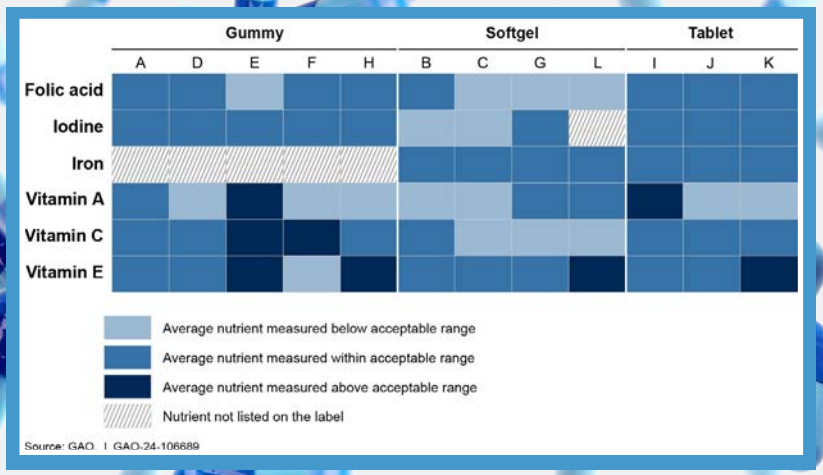
For a 2023 audit report, we assessed the accuracy of nutrient labels on over-the-counter prenatal supplements. To conduct this work, we bought supplements from a range of brands and had them tested by an accredited laboratory. Eleven of the 12 supplements did not fully match their labels: at least one nutrient was above or below the level claimed.

We delivered these findings in a brief report that took less than 9 months to complete. We recommended that Congress consider giving the Food and Drug Administration sufficient authority to oversee dietary supplements.


GAO

Prenatal Supplements: Amounts of Some Key Nutrients Differed from Product Labels

GAO-24-106689
Prenatal Supplements: Amounts of Some Key Nutrients Differed from Product Labels



CLOSER LOOK

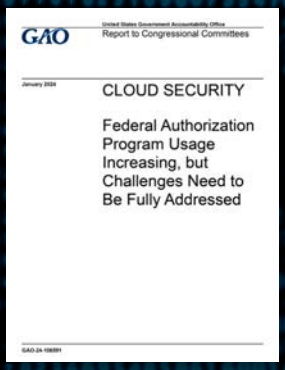
PROVIDING INSIGHT ON CYBERSECURITY

GAO's Information Technology and Cybersecurity team analyzed topics such as federal efforts to manage the cybersecurity of Internet of Things (IoT) devices, the national strategy for addressing agencies' cloud security practices and efforts to identify and mitigate risks related to AI and quantum computing. Our recommendations included that selected agencies use metrics to assess the effectiveness of key IoT cybersecurity efforts, that the National Cybersecurity Director take the lead on coordinating a national quantum computing cybersecurity strategy, and that selected agencies implement key cloud security practices such as continuous monitoring. We plan to continue assessing the cybersecurity implications of these technologies, as these risks are likely to grow more complicated.

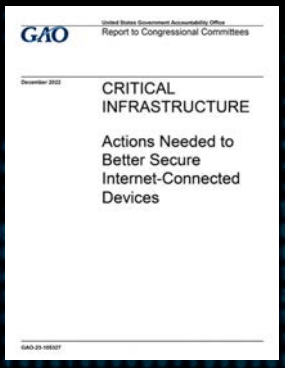
CYBERSECURITY: Our cybersecurity experts in ITC and its Center for Enhanced Cybersecurity have an extensive body of work on cybersecurity risks. Since 2010, GAO has made more than 4,410 recommendations to agencies aimed at remedying cybersecurity shortcomings. As of February 2025, about 760 of these recommendations had not yet been fully implemented. As part of our efforts to press for progress on full implementation of open recommendations, we identified 170 of these as warranting priority attention from department and agency heads. Of these 170 priority recommendations, 113 have been addressed so far.

GAO teams have shared their expertise on information technology and cybersecurity by providing trainings and developing guidance for the wider audit community. For example:

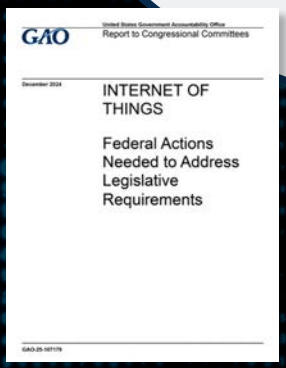
- ITC and STAA staff provided training in 2023 and 2024 to more than 50 international auditors on IT auditing and emerging technology topics.
- In 2022, ITC led a global team of auditors in updating the international IT Audit Handbook, which provides universally recognized standards and practices for conducting IT audits. ✦



GAO-24-106591
Cloud Security: Federal Authorization Program Usage Increasing, but Challenges Need to Be Fully Addressed



GAO-23-105327
Critical Infrastructure: Actions Needed to Better Secure Internet-Connected Devices



GAO-25-107179
Internet of Things: Federal Actions Needed to Address Legislative Requirements

GAO-25-107703
Future of Cybersecurity: Leadership Needed to Fully Define Quantum Threat Mitigation Strategy

PROVIDING TECHNICAL CONSULTATION TO MEMBERS

In addition to our formal reports, GAO also provides informal, consultative support to Members of Congress. Over the last 5 years, GAO teams have enhanced consultation services in science and technology, often with quick-turnaround.[6] Examples of this assistance include reviewing draft legislation, analyzing publicly available data, providing congressional hearing support, and briefing congressional staff on a particular federal program or technical issue. We also provide classes on S&T topics of broad interest to congressional staff. For example, STAA experts collaborated with the Congressional Staff Academy to provide sessions on AI and blockchain. In the spring of 2025, GAO's Chief Scientist and other GAO experts plan to host an AI boot camp for new congressional members and their staff.

Additionally, we have strengthened our direct contact with congressional staff to ensure we meet their needs for easy access to S&T resources. For example, GAO's Chief Scientist hosts weekly office hours in the Agency Connection Center in the Longworth House Office Building. He also hosts monthly "Let's Talk Science" sessions in the same space, where our scientists, specialists, and policy analysts present on various S&T topics. Recent sessions have covered AI data integrity, synthetic biology, U.S. competitiveness in science and technology, and commercial space and national security. Since our first event held in April 2024, STAA has led 10 events specific to S&T issues, and staff from 14 committees and 50 personal Member offices have attended. Our Chief Scientist also sends a quarterly S&T newsletter to congressional staff that previews upcoming events and highlights new developments.

GAO's Chief Scientist Quarterly S&T Newsletter for Congressional Staff

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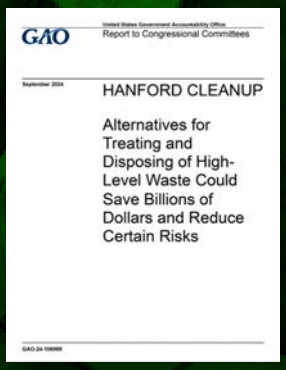
Get access to EMERGING here

Technical consultation requests have increased as we have made more Members and committees aware of this service. Over the past 2 years, nearly half of Congress's standing committees have called on us for quick-turnaround S&T assistance. In calendar year 2024 alone, STAA provided over 90 S&T technical consultations to over a dozen congressional committees and over 20 Members or their staff, a marked increase over prior years. STAA often collaborates with GAO's other organizational teams to ensure a broad base of expertise. Specifically, during calendar years 2023 and 2024, over 60 instances of technical consultation led by STAA involved such collaboration, which collectively represented 14 of our 15 teams.

CLOSER LOOK

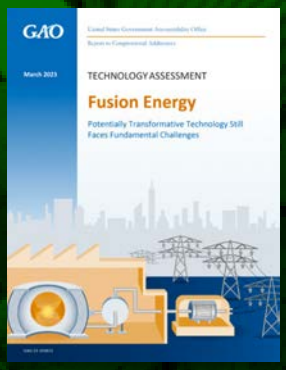
EXAMINING NUCLEAR ISSUES

Our extensive work on nuclear issues has improved Congress's oversight of federal activities and regulation. For example, our scientific and policy experts across GAO have collaborated for years to analyze the treatment and disposal of hazardous and radioactive waste at the Department of Energy's Hanford site in Washington State. The resulting recommendations delivered $13 billion in financial benefits to the U.S. government, with the potential for tens of billions of dollars in additional savings in the future. Our experts are also working in emerging technologies, such as fusion energy. We published a technology assessment on the topic in 2023 and have since provided technical consultation for congressional staff.



GAO-24-106989
Hanford Cleanup: Alternatives for Treating and Disposing of High-Level Waste Could Save Billions of Dollars and Reduce Certain Risks

GAO-24-105998
High-Risk Radioactive Material: Opportunities Exist to Improve the Security of Sources No Longer in Use



GAO-23-105813
Fusion Energy: Potentially Transformative Technology Still Faces Fundamental Challenges

One area that has seen a marked increase is congressional requests for our technical consultation on draft AI legislation. Specifically, during 2023 and 2024, STAA and other GAO experts provided technical consultation on 17 pieces of draft legislation for eight committees and the staff of five Members. Consultation topics included federal government procurement of AI, quantum cybersecurity training, and infectious disease preparedness and response. In one instance, we provided continuous technical consultation during a 6-month period to committee staff before markup on several pieces of key AI draft legislation, sometimes with a 24-hour turnaround.

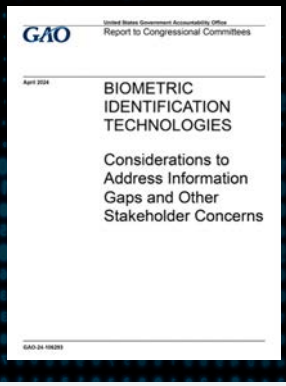
Our S&T experts have also served as witnesses at congressional hearings and roundtables. In calendar years 2023 and 2024, STAA and ITC experts served as key witnesses at six congressional hearings on critical S&T issues like AI, pandemic origins, forensic algorithms, and harmonization of cybersecurity regulations. In addition, in June 2024, our experts participated in a roundtable technical consultation on AI in health care and medicine with committee staff, and another roundtable on the same topic with the House AI Task Force staff.

The following month, our Chief Data Scientist participated in a House AI Caucus roundtable discussion on AI implementation across federal agencies.

CLOSER LOOK

PROVIDING INSIGHT ON IDENTITY VERIFICATION TECHNOLOGIES

In our ongoing oversight of biometric identity technologies, such as fingerprint matching and facial recognition, we have assessed the Department of Homeland Security's (DHS) efforts to implement a new biometric information management system and the General Services Administration's (GSA) collection of personally identifiable information through its government-wide identity proofing system, as well as benefits and challenges with its use. We made recommendations for DHS to describe planned methodologies for determining that all privacy controls are implemented correctly and operate as intended for the Homeland Advanced Recognition Technology system. We also recommended that GSA address agency identified technical issues with Login.gov. In the future, we plan to examine topics such as federal efforts to manage privacy risks with biometric systems.



GAO-24-106293
Biometric Identification Technologies: Considerations to Address Information Gaps and Other Stakeholder Concerns

(Select vignettes from this report are shown on the left)

We also provide just-in-time technical support for congressional committee staff in preparation for hearings on critical S&T issues. In the past 2 years, we have provided this assistance 15 times. For example, in summer 2024, STAA experts provided a technical briefing and drafted questions for witnesses for a committee chair's hearing on federally funded high-risk life sciences research. Similarly, in spring 2023, STAA experts briefed committee staff on quantum technology issues in advance of a hearing and provided questions for a witness.

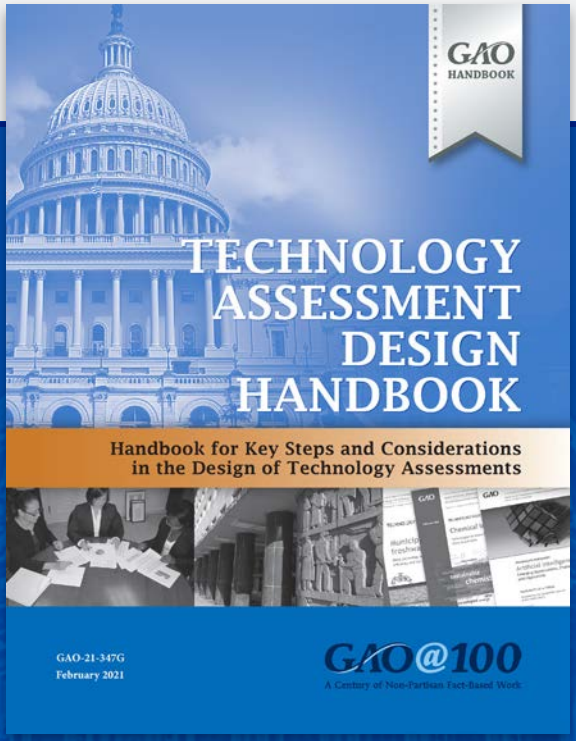
These are just a few examples of the many ways in which GAO supports the day-to-day activities of Congress.

To help ensure that Congress remains well-informed, GAO's Center for Strategic Foresight leads our efforts to identify, monitor, and analyze emerging issues facing policymakers through long-term and near-term strategic planning. For example, as far back as 2018, the center has highlighted key technological issues, such as quantum computing, deepfakes, and AI. With each new strategic plan, we also identify reports and other efforts to ensure Congress is well informed on those issues.

CLOSER LOOK

ENSURING TECHNOLOGY ASSESSMENTS MEET QUALITY STANDARDS

Our governance structure for technology assessments follows the comprehensive set of clearly defined, well-documented, and transparent standards and control procedures underlying all of our work—known as GAO's Quality Assurance Framework. This framework is designed to ensure that all GAO products provide accurate, credible, and balanced information. We also use our Technology Assessment Design Handbook, which we published in 2021 after a rigorous internal process, a meeting of outside experts, and a year of public review. Each technology assessment, including any policy options, goes through our internal fact-checking and review for adherence to standards. Each assessment is also reviewed by relevant federal agencies and a diverse group of external subject matter experts, with a balanced representation of industry, academia, government, and nongovernmental organizations.



We continually seek feedback to improve on the work that we provide Congress. Through a client feedback survey to congressional staff and a survey accompanying each GAO product, we assess the usefulness, clarity, and timeliness of each product that we issue.

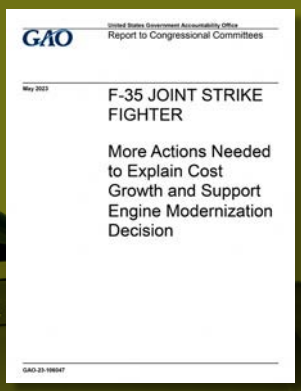
In addition, we are exploring new services to help Members and their staff better plan for the rapidly changing S&T environment. To help make our work more relevant, actionable, and understandable, we plan to further expand S&T-related trainings through new events on S&T foresight, such as workshops that bring together Members, agency officials, nonprofit executives, and industry leaders. Another new initiative is a program in which GAO senior officials serve as "ambassadors" to individual Members who are neither committee nor subcommittee chairs or ranking members. Started in 2024, the ambassador program helps to ensure the Members of Congress are aware of our S&T products and services. In 2024, GAO ambassadors contacted over 150 individual Members. ✦

GAO-25-107724

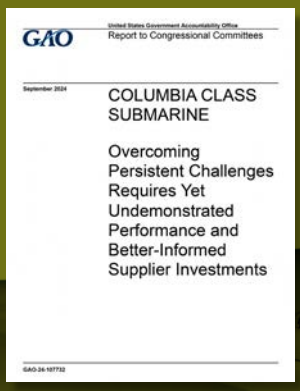
CLOSER LOOK

REPORTING ON MAJOR DEFENSE SPENDING

Our experts in federal programs and engineering sciences collaborate to evaluate planning on large-budget military modernization efforts. Our 54 recommendations on the F-35 aircraft program since 2001 have produced billions of dollars in financial benefits. Similarly, we have reviewed the Columbia Class Submarine program annually since 2017, most recently recommending that the Navy's cost estimates better identify and incorporate program risks. Below are two examples of this work:


GAO
United States Government Accountability Office
Report to Congressional Committees
May 2023
F-35 JOINT STRIKE FIGHTER
More Actions Needed to Explain Cost Growth and Support Engine Modernization Decision
GAO-23-106047

GAO-23-106047
F-35 Joint Strike Fighter: More Actions Needed to Explain Cost Growth and Support Engine Modernization Decision


GAO
United States Government Accountability Office
Report to Congressional Committees
September 2024
COLUMBIA CLASS SUBMARINE
Overcoming Persistent Challenges Requires Yet Undemonstrated Performance and Better-Informed Supplier Investments
GAO-24-107732

GAO-24-107732
Columbia Class Submarine: Overcoming Persistent Challenges Requires Yet Undemonstrated Performance and Better-Informed Supplier Investments

CASE STUDY

GOING DEEP ON AI

This case study details how GAO applies expanding capacity in science and technology to a key field: artificial intelligence (AI).

QUICK-TURNAROUND AND CONSULTATIVE SUPPORT

In calendar years 2023 and 2024, we provided over 67 instances of technical consultation on AI to dozens of committee and Member staff. For example, in March 2024, our experts provided rapid input to a request for comments on draft legislation to establish safeguards for federal use of AI. And in July 2024, our experts responded in less than 24 hours a different draft of AI legislation for a committee chair.

LEVERAGING EXPERTS

We call often on a network of experts—to support our reporting process, to monitor new developments, and to connect congressional offices with experts. To maintain and grow this network, we presented at more than 20 AI-focused events in 2024 alone.

TRAINING

In 2022, we provided four AI-related training seminars through the Congressional Staff Academy. Topics included AI applications in health care and law enforcement. More than 500 congressional staff registered for the seminars. In 2024, we provided three training sessions to congressional staff at the House Longworth Agency Connection Center—one on generative AI in health care, one on data privacy, and one on data integrity. In Spring of 2025, we plan to provide an AI Bootcamp, directed at new Members but available to any Member or their staff.

GOING DEEP ON AI

SHORT–AND–MEDIUM–TERM REPORTS

STAA has issued five Science & Tech Spotlights on AI. These publications provide concise overviews and generally are developed in 3 months or less. Our experts have twice prepared congressional testimony in about a month, and we have published two medium-term Q&A reports on generative AI.

TECHNOLOGY ASSESSMENTS

STAA published its first technology assessment on AI in 2019, anticipating its explosive growth and complex challenges. We have since published seven more, covering such applications as generative AI, AI in natural hazard modeling, and AI in health care.

HORIZON SCANNING

GAO has been using a method called horizon scanning for about 6 years, through our Center for Strategic Foresight. We issued our first On the Horizon trends report in November 2024, and future reports could focus on the long-term future of AI.

AI ACCOUNTABILITY FRAMEWORK

Our 2021 framework continues to be a model for use of AI by federal, state, and local governments. It describes concrete practices for implementing four principles for AI: governance, data, performance, and monitoring.

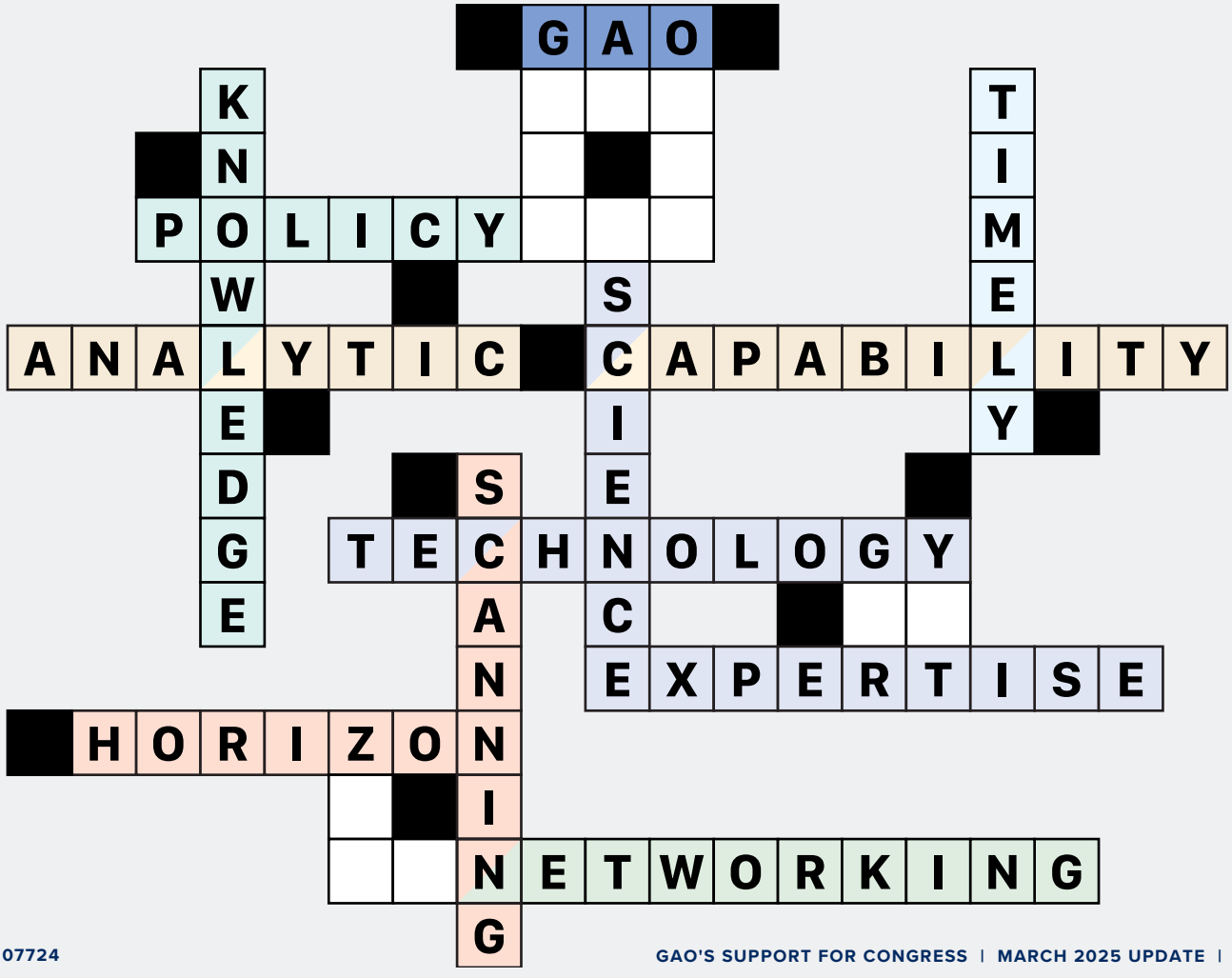
OTHER PUBLICATIONS

Our other publications have covered topics such as generative AI, facial recognition technology, automated trucking, money laundering, and federal implementation of AI. We have published over 60 reports and other publications on AI since 2018.

SECTION 2

COMBINING POLICY KNOWLEDGE WITH SCIENCE AND TECHNOLOGY EXPERTISE

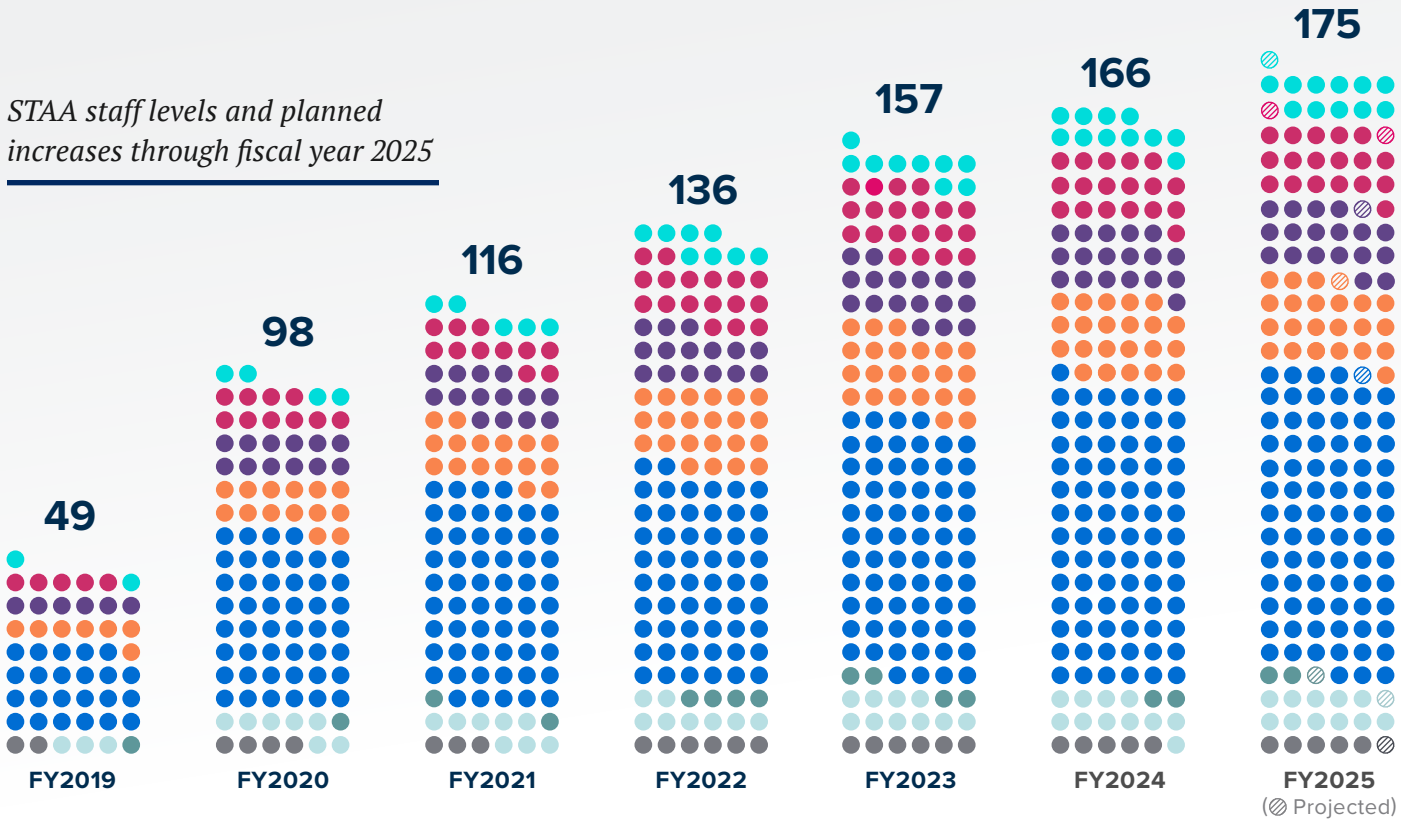
Key to GAO's expanded S&T products and services is our staff growth, both in number and expertise, allowing us to increase our support for Congress in this area. In building this capacity, we also have deepened our collaborations between our technical experts and our more traditional staff of policy analysts experienced in the operations and management of the federal government. This combination of depth and breadth of expertise positions us to provide Congress with analysis that is both rigorous and actionable. GAO's growth in science and technology has also allowed us to expand our networking support for Congress, which was one of the gaps identified in the 2019 NAPA report. ✦



BUILDING A STAFF OF DIVERSE S&T EXPERTS

GAO has S&T experts in fields such as health care, energy, environmental science, engineering, aeronautics, and forensics. In the last 5 years, we have prioritized hiring S&T experts in two organizational teams: STAA and ITC. STAA's staff has grown from 49 people in 2019 to 166 at the end of fiscal year 2024. By the end of fiscal year 2025, we plan to reach a total of 175 staff subject to final appropriations from Congress (see below).

STAA staff levels and planned increases through fiscal year 2025



JOB CATEGORY

- Natural Resources Management & Biological Sciences
- Engineering
- S&T Policy Analyst
- Information & Arts
- Physical Sciences
- Mathematical & Data Sciences
- Digital Sciences
- Administration & Management

STAA staff hold over 100 advanced degrees in science, technology, engineering, and mathematics, including 42 PhDs. These degrees are in fields such as microbiology, materials chemistry, nuclear physics, public health, and aerospace engineering. One particular area of focus is data science: our Innovation Lab, established in 2019 as part of STAA, has 15 staff, including eight data scientists and three technologists, who focus on harnessing the latest technology to improve auditing at GAO and in the broader federal audit community.

GAO Science and Technology expertise spans many fields and subjects

OUR SCIENCE AND TECHNOLOGY (S&T) STAFF INCLUDE:

- **Chief Scientist**
- **Scientists and Specialists**
  - Atmospheric science
  - Biology
  - Chemistry
  - Environmental chemistry
  - Geology
  - Microbiology
  - Nuclear physics
  - Physics
  - Public health
- **Engineers**
  - Aerospace
  - Biomedical
  - Chemical
  - Civil
  - Computer
  - Electrical
  - Environmental
  - Systems
- **Operations research analysts**
- **Policy analysts**
- **Data scientists**
- **Technologists**
- **Mathematicians**
- **Computer scientists**

EXAMPLES OF THEIR CONTRIBUTIONS TO S&T WORK:

Our Chief Scientist advises GAO on science and technology matters, including **strategy, foresight, and rapid support to Congress**. GAO's Chief Scientist has fostered several new initiatives, including weekly office hours and monthly S&T events at the Agency Connection Center in the Longworth House Office Building.

Our biologists reported on **brain-computer interfaces, low-dose radiation, and regenerative medicine**. In these reports, we also offered options for policymakers to address the most significant challenges and recommended ways to improve research collaboration.

Our chemists have provided policy insights and recommendations regarding forensic techniques for **the identification of chemical weapons**, the use of **AI in drug development**, and the potential effects of inaccurate labeling of **prenatal supplements**.

Our physicists contributed to our work on the Department of Energy's **fusion energy** program, nuclear power plant **climate resilience**, and subcritical experiments for **nuclear weapons modernization**.

Our quantum experts developed a body of work on **quantum computing, communications, and sensing** and have contributed to ongoing work on preparing the federal government for **post-quantum cybersecurity**.

Our **aerospace, civil, electrical, and other** engineers provided expertise on our work reviewing Department of Defense use of alternatives to the **GPS** (Global Positioning System) for position, navigation, and timing; and technology assessments on **energy storage**; **critical minerals**, and **precision agriculture**.

Our operations research analysts developed **best practices guides** for technology implementation or use, including guides on **Cost, Schedule, Technology Readiness Assessment**, and **Agile Software Development**. These analysts also provide engineering sciences insights into other GAO teams' evaluations of federal programs, such as the Department of Defense's **F-35 aircraft** and the **Columbia Class Submarine**.

Our policy analysts helped evaluate **critical S&T issues**, including **biomedical research** patenting, small business **research commercialization**, and U.S. manufacturing policy for **energy technologies**. They also assisted and informed policy makers as they considered the right balance between collaboration and potential research security issues, such as in **U.S.-China research collaboration**.

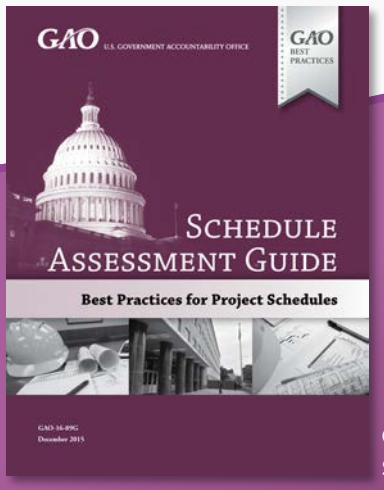
Our data scientists leverage statistics and machine learning techniques to address operational and oversight challenges. For example, identifying federal awards at risk due to severe, **persistent financial control** deficiencies and demonstrating the potential for **government-wide statistical models** to identify and support responses to these risks.

Our technologists conduct applied and experiential research and **develop prototypes** leveraging emerging technologies to enhance GAO's oversight capacity. For example, they developed proof-of-concept **aerial and terrestrial data collection instrumentation**, piloted an application of **extended reality**, and deployed a purpose-built **generative AI** application.

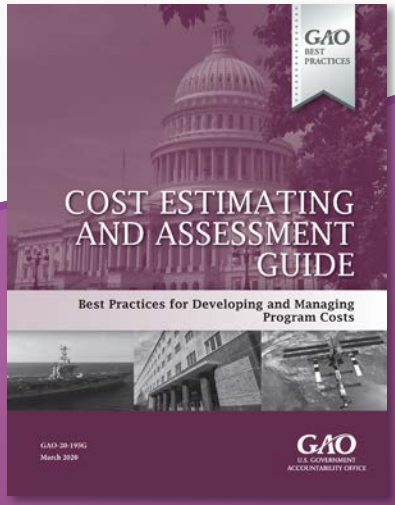
In addition, since 2019, our ITC team has hired 121 specialists with cybersecurity knowledge, skills, and expertise and plans to hire an additional 12 specialists by October 2025. In 2019, ITC created the Center for Enhanced Cybersecurity, bringing additional focus and capacity to its work. The center is a dedicated group of cyber professionals who evaluate information systems and security networks during technical audits on persistent cybersecurity weaknesses within federal agencies. The center also operates and maintains a secure high-performance computing environment to research emerging trends in cybersecurity and create opportunities to explore solutions to both current and future challenges in cyberspace. Since 2020, we have increased the center's staff from 14 to 38 employees. Other GAO teams also have S&T experts, including clinical nurse consultants in our Health Care team, and epidemiologists and a biostatistician in our Applied Research and Methods team.

A long-standing cadre of experts that remains critical to our work is STAA's engineering sciences group. These experts help our audit teams hold federal agencies accountable for the efficiency and effectiveness of their operations. One critical contribution the group makes is to publish technical guides on best practices for federal agencies, covering topics such as cost estimation, schedule assessment, and technology readiness assessment, as well as a guide on Agile software development. Since 2019, this group has supported more than 100 performance audits GAO-wide and contributed to significant federal cost savings.

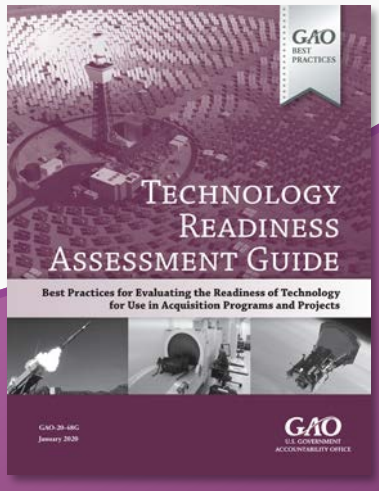
GAO Guides help improve government oversight



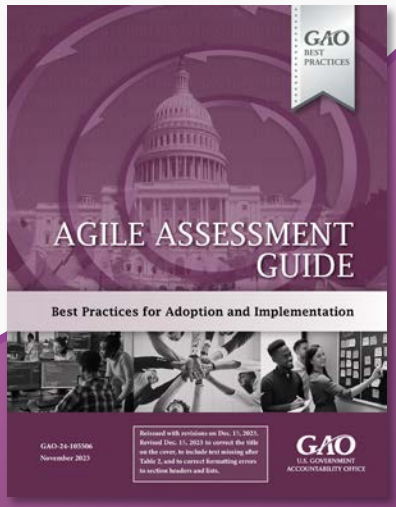
GAO-16-89G
Schedule Assessment Guide



GAO-20-195G
Cost Estimating and Assessment Guide



GAO-20-48G
Technology Readiness Assessment Guide



GAO-24-105506
Agile Assessment Guide

In addition, STAA provides technical expertise and insight for audits throughout GAO. During calendar year 2024, STAA lent their S&T expertise to the development of 212 GAO reports.

To ensure we can maintain and increase the breadth and depth of our expertise, we used two flexible hiring authorities during fiscal year 2024: an entry-level pathway through undergraduate and graduate internships and GAO's first cohort of S&T Fellows. The latter pathway brings postdoctoral researchers to GAO for 1 to 3 years. Both pathways enhance our skills both within STAA and agencywide. ✦

The GAO Agile Guide features "Agile Explained" vignettes to summarize key workflows

CONNECTING CONGRESS WITH EXTERNAL EXPERTS

We recognize that networking and collaboration with external S&T experts is essential. The 2019 NAPA report also recognized this congressional need, and it identified networking as a gap in congressional support. In response, we immediately began growing our already extensive network of such experts. For our next phase, we are enhancing and formalizing our process to facilitate congressional access to S&T experts. Some examples of our networking efforts include the following:

POLARIS COUNCIL. STAA convenes the Polaris Council, which includes 23 members, three times each year. Council members are senior leaders in academia, industry, and civil society with expertise across a range of disciplines who advise STAA on its technology assessments and foresight issues and practices. Council members also help ensure this work is sound, sophisticated, and useful to Congress and the public.

NATIONAL ACADEMIES OF SCIENCES, ENGINEERING, AND MEDICINE. GAO also partners with the National Academies to identify experts to inform our work. This institution is particularly important in helping us select experts to contribute to our technology assessments. A president of one of the Academies serves on the Polaris Council. From 2019 through 2022, three of our technology assessments—the use of AI in drug development, patient care, and medical diagnostics—represented such a close collaboration that we issued them jointly with the National Academy of Medicine.[7]

CLOSER LOOK

NETWORKING TO IMPROVE OUR WORK

Using feedback from the science, technology, and policy experts on GAO's Polaris Council, STAA has improved the design of technology assessments and Science & Tech Spotlights. For example, we have redesigned the policy options within our technology assessments to be more specific and to identify which policymakers could be involved in implementing each option. STAA has also used feedback from the Polaris Council to improve the layout and readability of our short-term Science & Tech Spotlights.

INTERNATIONAL COLLABORATION. We have collaborated and will continue to collaborate with international organizations to support technology assessment. For example, in 2023 and 2024, STAA's policy analysts, scientists, and communicators presented on our work at the meetings of the European Parliamentary Technology Assessment network. We also engage with international peers through organizations such as the International Organization of Supreme Audit Institutions and the Organisation for Economic Co-operation and Development.

OTHER COLLABORATIONS. The Comptroller General, the head of GAO, convenes an advisory board consisting of members from government, industry, and academia. In addition, our Contracting and National Security Acquisitions team networks with innovative companies across a variety of sectors to inform ongoing work on leading practices in product development.

We have also demonstrated our S&T leadership by sharing our knowledge and experience with other institutions at the international, state, local, and federal levels. For example:

- STAA met with staff from the United Kingdom's National Audit Office at their request to help them develop a strategy for evaluating government research, development, and innovation activities.
- STAA briefed a Washington State legislative committee, as well as staff at the Environmental Protection Agency, on auditing government use of AI.
- STAA presented to the Environmental Protection Agency Inspector General Innovation Advisory Board in August 2024 on AI and GAO's AI Accountability Framework.

TECHNICAL CONFERENCES. We participated in more than 70 technical conferences and industry events in 2024. At these events, we share our work, learn from other experts, and keep abreast of current thinking on S&T issues. STAA experts have served as speakers at more than 500 such events since 2019. We have also held smaller meetings with external groups to share our publications and services.

DIRECT CONGRESSIONAL ACCESS. As a result of our growing network—which spans government, academia, and industry, both domestic and international—congressional staff have increasingly asked us to help connect them to external S&T experts. For example, in fall 2024, congressional staff asked STAA to provide a list of non-governmental experts in biosafety and biosecurity to aid them in their selection of witnesses for a planned hearing. Earlier that year, staff on a House committee asked our Chief Scientist and Chief Data Scientist to recommend non-federal witnesses for an AI roundtable. And in fall 2023, committee staff asked STAA to recommend experts in AI in health care for a possible hearing.

Congress has access to GAO's network of S&T experts for real-time technical consultation. We are expanding access to include a larger cadre of S&T experts and a mechanism for congressional access to this service, as needed. These experts are from multiple sectors, such as academia and industry, with whom we can collaborate to support Congress. We plan to have this expansion underway by summer 2025. ✦

SECTION 3

HELPING CONGRESS PREPARE FOR TOMORROW'S SCIENCE AND TECHNOLOGY CHALLENGES

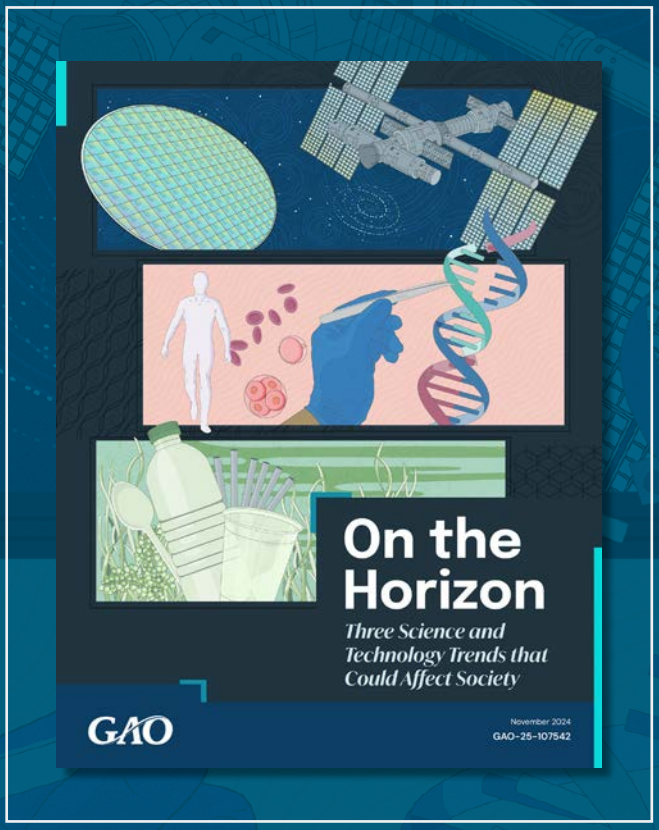
As GAO expands its products, services, and capabilities, we also recognize the need to help Congress anticipate breakthroughs and manage the opportunities and risks they present to the nation. As part of this effort, we use horizon scanning, a method that helps us anticipate and respond to the unexpected. (Horizon scanning was the fourth and largest gap identified in the 2019 NAPA report.) In addition, GAO's data scientists and technologists explore new ways of collecting information and analyzing data to enhance our operational and oversight capacities. ✦

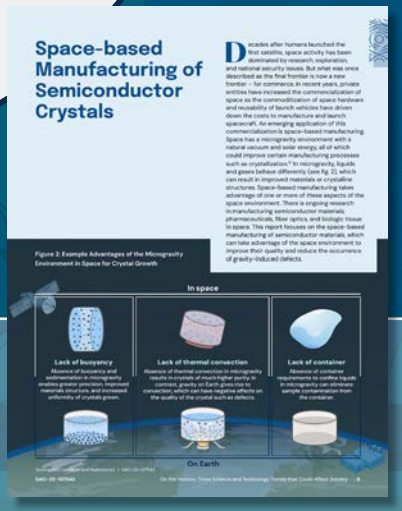
HORIZON SCANNING TO ANTICIPATE TOMORROW'S S&T ISSUES

We are committed to helping Congress stay aware of emerging technologies well into the future. Our Chief Scientist works with STAA leadership and our core group of scientists and policy analysts to continually monitor S&T issues. This group meets regularly to exchange ideas and develop GAO's strategy on new S&T developments.

One product of this ongoing effort is the launch of GAO's periodic On the Horizon report on trends in science and technology, which focuses on a time horizon of approximately 10 years. The goal is to provide horizon scanning insight into developing technologies that could have significant impacts on Americans.

We issued our first *On the Horizon* in November 2024, highlighting three technologies: gene editing, space-based manufacturing of semiconductor crystals, and biodegradable plastics.[8] ✦

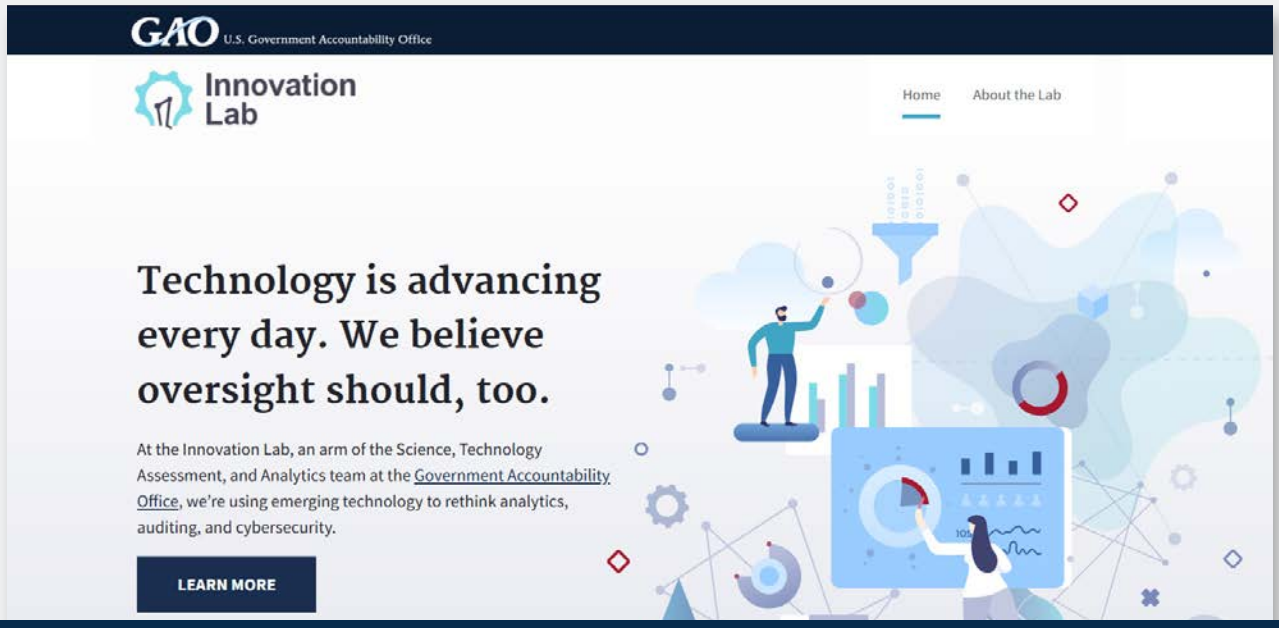


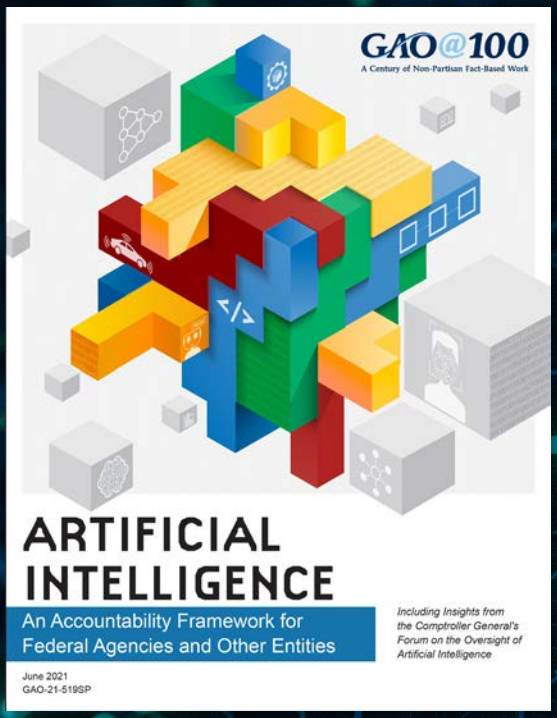


PROVIDING ADVANCED ANALYTIC CAPABILITIES

GAO's Innovation Lab, formed as part of STAA in 2019, continues to apply a hands-on approach to explore data science and emerging technology through experiments. By adapting large language models, applying immersive technologies, and using other data-centric ideas, the Innovation Lab is using AI to improve GAO's operations and ability to provide cutting-edge analysis for Congress. Examples include:

- **HELPING DEVELOP GAO'S VISION FOR HOW WE USE AI.** The lab is testing a generative AI prototype hosted on our own infrastructure that can accelerate staff searches for agency-specific information. This system has the same capabilities found in industry and is tailored to meet our unique needs. It will help guide our vision and the development of policy and controls, while ensuring that our data are secure.
- **MONITORING LEGISLATIVE ACTIVITY.** The lab deployed a prototype that uses generative AI to identify and summarize legislative mandates for GAO action and to produce a database of legislation that is used by multiple other lab products.
- **DEVELOPING DATA SCIENCE AND EMERGING TECHNOLOGY PROTOTYPES FOR USE ACROSS GAO.** The lab deployed custom-built software to enhance oversight of federal grants and other financial funding. In 2024, a GAO audit team used the tool to help identify $1.17 trillion of "at risk" awards due to deficiencies in financial controls. Less than a year after the report was published, the Senate Committee on Homeland Security and Governmental Affairs passed legislation to address the report's recommendations, which became law later that year. In another example, the lab developed a software tool that allowed our audit staff to analyze mortgage data without the need for programming knowledge.

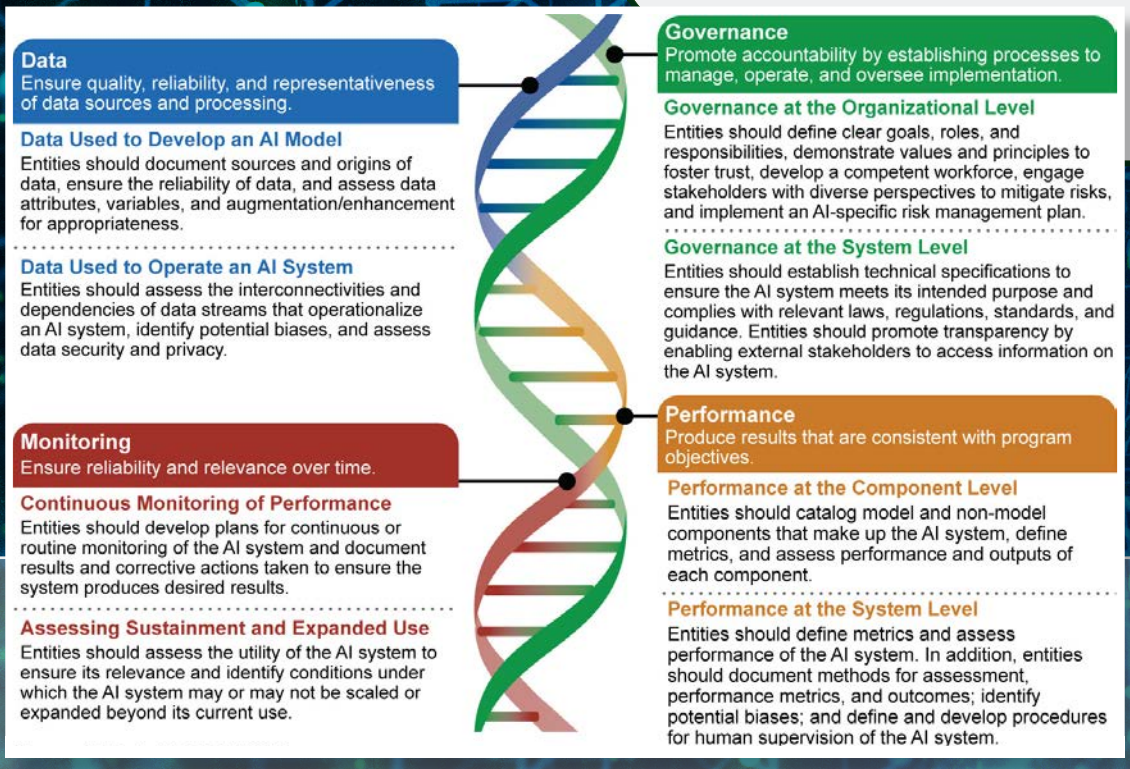




The lab also aims to meet Congress's growing need for an unbiased perspective on topics such as AI, blockchain, and other emerging technologies. During 2023 and 2024, lab staff met with over a dozen congressional committee staff and Members, as well as staff from the Congressional Research Service and Congressional Budget Office to discuss topics such as AI governance, AI use cases, and GAO's AI Accountability Framework. Lab experts also provided live demonstrations of AI and other emerging technologies, including our generative AI prototype under development.

The lab also hosted 10 visits from international partners, including Indonesia, the United Kingdom, and the European Court of Auditors. The latter visit allowed for an exchange of ideas and approaches that the European Union and the United States are taking regarding AI regulation. ✦

GAO's Artificial intelligence Accountability Framework helps to ensure responsible AI use



IN CLOSING

GAO exists to support Congress in meeting its constitutional responsibilities. As the role of science and technology in American society grows, so must our investment in helping Congress prepare for new developments. That investment is underway: we have hired more staff with broader S&T expertise, and we continue to expand our products, services, and network of external experts. We are also ensuring that congressional committees and Members are aware of our S&T capabilities, and that we are available to provide the support they need when they need it.

We will continue to expand our investments, so that we support Congress in understanding not only what is happening now but what is coming. This shift will require more innovation, both in our methods and in how we leverage new technology. We remain committed to this ongoing innovation, and to accomplishing it while maintaining the high standards of quality and nonpartisanship that have been our calling card for more than a century. ✦

APPENDIX I

● Audit report
◉ Spotlight
▲ Technology Assessment

GAO Critical S&T Issues: Selected Issued Reports and Ongoing Work

Biomedical and Health Innovations

▲ **Regenerative Medicine**: Therapeutic Applications, Challenges, and Policy Options, GAO-23-105430

▲ **Antiviral Drugs**: Economic Incentives and Strategies for Pandemic Preparedness, GAO-23-105847

● **Prenatal Supplements**: Amounts of Some Key Nutrients Differed from Product Labels, GAO-24-106689

● **Medical Device Cybersecurity**: Agencies Need to Update Agreement to Ensure Effective Coordination, GAO-24-106683

● **Biomedical Research**: Actions Needed to Adopt Collaboration Practices to Address Research Duplication, GAO-24-106757

◉ **At-Home Tools to Diagnose Alzheimer's, Parkinson's, and Related Diseases**, GAO-24-107306

● **Virus Field Research**: Policy Options to Help Reduce Risks and Enhance Benefits, GAO-24-106759

◉ **Generative AI in Health Care**, GAO-24-107634

▲ **Brain-Computer Interfaces**: Applications, Challenges, and Policy Options, GAO-25-106952

● **COVID-19**: HHS Needs to Identify Duplicative Pandemic IT Systems and Implement Key Privacy Requirements, GAO-24-106638

ONGOING

- HHS Funding and Security of Genomic Sequencing Data
- Human Organ-on-a-Chip
- FDA Drug Shortages
- Comparison of Biosafety and Biosecurity Standards for the U.S. and Other Countries

Computing and Communications

● **Quantum Technologies**: Defense Laboratories Should Take Steps to Improve Workforce Planning, GAO-24-106284

● **Artificial Intelligences**: Agencies Have Begun Implementation but Need to Complete Key Requirements, GAO-24-105980

◉ **Combating Deepfakes**, GAO-24-107292

● **Immersive Technologies**: Most Civilian Agencies Are Using or Plan to Use Augmented Reality, Virtual Reality, and More, GAO-24-106665

● **Secure Communications**: Air Force Should Improve Accountability for Fully Modernizing Link 16 Radio Systems, GAO-24-106357SU

● **Economic Sanctions**: Agency Efforts Help Mitigate Some of the Risks Posed by Digital Assets, GAO-24-106178

● **Cybersecurity**: Federal Agencies Made Progress, but Need to Fully Implement Incident Response Requirements, GAO-24-105658

● **Digital Surveillance of Workers**: Tools, Uses, and Stakeholder Perspectives, GAO-24-107639

● **Artificial Intelligence**: DHS Needs to Improve Risk Assessment Guidance for Critical Infrastructure Sectors, GAO-25-107435

ONGOING

- Quantum Computing Cybersecurity Preparedness
- Spectrum Cybersecurity and Interoperability
- IRS Use of Artificial Intelligence
- NASA Mission Cybersecurity Risk Management
- Generative AI Environmental and Human Effects

Defense and Homeland Security

▲ **Chemical Weapons**: Status of Forensic Technologies and Challenges to Source Attribution, GAO-23-105439

● **Biodefense**: National Biosurveillance Integration Center Has Taken Steps to Address Challenges, but Could Better Assess Results, GAO-24-106142

● **Artificial Intelligence**: Fully Implementing Key Practices Could Help DHS Ensure Responsible Use for Cybersecurity, GAO-24-106246

● **Biometric Identification Technologies**: Considerations to Address Information Gaps and Other Stakeholder Concerns, GAO-24-106293

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● **Hypersonic Weapons**: DOD Could Reduce Cost and Schedule Risks by Following Leading Practices, GAO-24-106792

● **Directed Energy Weapons**: DOD Should Focus on Transition Planning, GAO-23-105868

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● **Space Situational Awareness**: DOD Should Evaluate How It Can Use Commercial Data, GAO-23-105565

● **Protected Satellite Communications**: Amid Prototyping Progress, DOD Could Face Future Integration Challenges, GAO-24-106788SU

ONGOING

- DOD's Missile Warning and Tracking Satellites
- Hypersonic and Cruise Missile Defense
- 2025 Annual Assessment of Weapon Programs
- Roles and Responsibilities of DOD's Office of Research and Engineering

APPENDIX I

Federal Science Oversight

- **CARES Act**: Experts Identified Safeguards to Help Selected HHS Agencies Protect Against Potential Political Interference, GAO-23-106529
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- **China**: Efforts Underway to Address Technology Transfer Risk at U.S. Universities, but ICE Could Improve Related Data, GAO-23-106114
- **Small Business Research Programs**: Opportunities Exist for SBA and Agencies to Reduce Vulnerabilities to Fraud, Waste, and Abuse, GAO-24-105470
- **Federal Research Centers**: DHS Actions Could Reduce the Potential for Unnecessary Overlap among Its R&D Projects, GAO-25-106394

ONGOING

- Patent Examination at the U.S. Patent and Trademark Office
- VA Clinicians' Research Time
- HHS Oversight of High-Risk Research
- Federal and Contractor Cyber Workforce at Major Agencies

Environment, Energy, and Agriculture

- ▲ **Artificial Intelligence in Natural Hazard Modeling**: Severe Storms, Hurricanes, Floods, and Wildfires, GAO-24-106213
- ▲ **Precision Agriculture**: Benefits and Challenges for Technology Adoption and Use, GAO-24-105962
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- ▲ **Wind Energy**: Technologies and Approaches to Help Address Environmental Effects, GAO-24-106687
- **Fusion Energy**: Additional Planning Would Strengthen DOE's Efforts to Facilitate Commercialization, GAO-25-107037
- **Persistent Chemicals**: Additional EPA Actions Could Help Public Water Systems Address PFAS in Drinking Water, GAO-24-106523
- ▲ **Cloud Seeding Technology**: Assessing Effectiveness and Other Challenges, GAO-25-107328
- **Clean Energy**: New DOE Office Should Take Steps to Improve Performance Management and Workforce Planning, GAO-25-106748

ONGOING

- Offshore Wind Energy Development
- Waste Isolation Pilot Plant Critical Infrastructure for Radioactive Waste
- Geostationary Extended Observations Weather Satellite Program
- ⦿ Sustainable Building Technologies Science & Tech Spotlight

Space and Transportation

- **NASA Artemis Programs**: Crewed Moon Landing Faces Multiple Challenges, GAO-24-106256
- **Commercial Space Transportation**: FAA's Oversight of Human Spaceflight, GAO-24-106184
- **Port Infrastructure**: U.S. Ports Have Adopted Some Automation Technologies and Report Varied Effects, GAO-24-106498
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- **GPS Modernization**: Delays Continue in Delivering More Secure Capability for the Warfighter, GAO-24-106841
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- **Coast Guard**: Autonomous Ships and Efforts to Regulate Them, GAO-24-107059

ONGOING

- ▲ Smart City Technologies
- DOD Space Protection Programs 2024
- Non-Intrusive Systems for Inspecting Vehicles and Cargo at Ports of Entry
- Electric Vehicle Charging Infrastructure
- DOD Space Laser Communications

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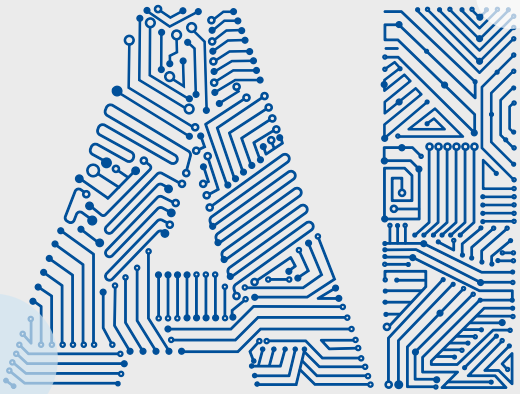

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A SELECTION OF AI WORK FROM GAO

Cybersecurity & Privacy

- **Artificial Intelligence**: DHS Needs to Improve Risk Assessment Guidance for Critical Infrastructure Sectors GAO-25-107435 (2024)
- **Biometric Identification Technologies**: Considerations to Address Information Gaps and Other Stakeholder Concerns GAO-24-106293 (2024)
- **Artificial Intelligence**: Fully Implementing Key Practices Could Help DHS Ensure Responsible Use for Cybersecurity GAO-24-106246 (2024)

ONGOING

- Privacy Risks in Artificial Intelligence

AI Opportunities & Challenges

- **Artificial Intelligence**: Generative AI Training, Development, and Deployment Considerations GAO-25-107651 (2024)
- **Artificial Intelligence**: Generative AI Technologies and Their Commercial Applications GAO-24-106946 (2024)
- **Driver Assistance Technologies**: NHTSA Should Take Action to Enhance Consumer Understanding of Capabilities and Limitations GAO-24-106255 (2024)
- **Artificial Intelligence in Natural Hazard Modeling**: Severe Storms, Hurricanes, Floods, and Wildfires GAO-24-106213 (2023)
- **Generative AI** (Science & Tech Spotlight) GAO-23-106782 (2023)

ONGOING

- Artificial Intelligence (AI) National Strategy
- Science and Technology Trends (2025)
- Generative AI - Human and Environmental Effects Technology Assessment, Federal R&D and Implementation
- Smart Cities Technology Assessment

Federal Research & Management

- **Artificial Intelligence:** Agencies Are Implementing Management and Personnel Requirements GAO-24-107332 (2024)
- **Immersive Technologies:** Most Civilian Agencies Are Using or Plan to Use Augmented Reality, Virtual Reality, and More GAO-24-106665 (2024)
- **Federal Regulation:** Selected Emerging Technologies Highlight the Need for Legislative Analysis and Enhanced Coordination GAO-24-106122 (2024)
- **Artificial Intelligence**: GAO's Work to Leverage Technology and Ensure Responsible Use GAO-24-107237 (2024)
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ONGOING

- SBA Use of AI Tools
- Artificial Intelligence (AI) Competitiveness Assessment

Finance

- **Tax Gap**: IRS Should Take Steps to Ensure Continued Improvement in Estimates GAO-24-106449 (2024)
- **Tax Enforcement**: IRS Audit Selection Processes for Returns Claiming Refundable Credits Could Better Address Equity GAO-24-106126 (2024)
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- **Trafficking and Money Laundering**: Strategies Used by Criminal Groups and Terrorists and Federal Efforts to Combat Them GAO-22-104807 (2021)

ONGOING

- IRS Use of Artificial Intelligence
- AI in Financial Services
- Homebuyers, Rental Property Technology

APPENDIX II

Federal Workforce

- **Workplace Safety and Health**: OSHA Should Take Steps to Better Identify and Address Ergonomic Hazards at Warehouses and Delivery Companies
  GAO-24-106413 (2024)
- **Artificial Intelligence**: Actions Needed to Improve DOD's Workforce Management
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- **FAA Workforce**: Better Assessing Employees' Skill Gaps Could Help FAA Prepare for Changes in Technology
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  GAO-19-181 (2019)
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  GAO-19-257 (2019)
- **Automated Trucking**: Federal Agencies Should Take Additional Steps to Prepare for Potential Workforce Effects
  GAO-19-161 (2019)

ONGOING

- Digital Surveillance of Workers
- Federal AI Acquisitions

Defense & Law Enforcement

- **Law Enforcement**: DHS Could Better Address Bias Risk and Enhance Privacy Protections for Technologies Used in Public
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- **Coast Guard**: Autonomous Ships and Efforts to Regulate Them
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- **Space Operations**: National Space Defense Center Faces Enduring Challenges
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ONGOING

- Navy Autonomous Systems
- DOD Responsible AI Oversight and Implementation
- Agency Technology and Skills to Address Foreign Information Operations

Health Care

- **Generative AI in Health Care** (Science & Technology Spotlight)
  GAO-24-107634 (2024)
- **National Institute on Aging**: Leading Project Management Practices Are Important for Large-Scale Health Data Efforts
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- **Artificial Intelligence in Health Care**: Benefits and Challenges of Machine Learning Technologies for Medical Diagnostics
  GAO-22-104629 (2022)
- **Vaccine Development**: Capabilities and Challenges for Addressing Infectious Diseases
  GAO-22-104371 (2021)

ONGOING

- Medical Wearables for Clinical Decision-making

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END NOTES

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