U.S. HOUSE OF REPRESENTATIVES
COMMITTEE ON SCIENCE, SPACE, AND TECHNOLOGY
HEARING CHARTER

Experts Needed: Options for Improved Science and Technology Advice for Congress

Thursday, December 5, 2019
10:00 am – 12:00 pm
2318 Rayburn House Office Building

PURPOSE

On Thursday, December 5, 2019 at 10:00 am, the Committee on Science, Space, and Technology will hold a hearing to examine Congress's needs for advice to understand and address the growing number of science and technology policy issues facing the nation. The Committee will also assess the gaps in accessible science and technology resources and advice, and explore the opportunities and challenges for addressing such gaps, including whether a renewed Office of Technology Assessment would meet the needs.

WITNESSES

- **The Honorable Michael McCord**; Director, Civil-Military Programs; Stennis Center for Public Service
- **Ms. Laura Manley**; Director, Technology and Public Purpose Project; Belfer Center for Science and International Affairs; Harvard Kennedy School of Government
- **Dr. Tim Persons**; Chief Scientist and Managing Director; Science, Technology Assessment, and Analytics; U.S. Government Accountability Office
- **Dr. Peter Blair**; Executive Director, Division on Engineering and Physical Sciences; The National Academies of Sciences, Engineering, and Medicine

KEY QUESTIONS

- How does Congress use science and technology advice to inform its legislative and oversight activities?
- What are the current internal and external sources of science and technology advice for Congress? How does Congress solicit and receive such advice?
- What gaps exist in accessible science and technology resources and advice to Congress? How do these gaps affect Congress's ability to carry out its responsibilities?
- What options are available to improve science and technology advice for Congress? What are the strengths and weaknesses of these options?

OVERVIEW

Congress is routinely faced with decisions that involve complex science and technology (S&T) issues. Examples include developing environmental regulations, appropriating funds for research programs, developing legislation on issues like agriculture and health care, and responding to the risks and opportunities that come with emerging technologies like synthetic biology and artificial intelligence. Since Members of Congress and their staff typically don't have scientific or technical backgrounds, they rely on expert advice from a range of sources internal and external to the legislative branch.

From 1972 to 1995, Congress had a small nonpartisan support agency within the legislative branch dedicated to providing legislators with S&T advice. The Office of Technology Assessment (OTA) prepared reports on a broad range of S&T topics to help inform congressional decision-making.

OTA was created with bipartisan support out of a concern about the imbalance in Congress's analytical capability relative to that of the Executive Branch. While the Executive Branch had its own technical experts on staff and the Office of Science and Technology Policy (OSTP) at its disposal, Congress was often forced to rely on analyses provided by Federal agencies or third parties with their own interests. Many saw the lack of independent capabilities for technical analysis as an impediment to Congress's ability to fulfill both its legislative and oversight responsibilities. However, bipartisan support for the OTA began to falter, and in 1995, Congress eliminated funding for the OTA as part of an effort to reduce the national budget.

The remaining sources of S&T advice for Congress include the Government Accountability Office (GAO), the Congressional Research Service (CRS), the National Academy of Sciences, Engineering, and Medicine (NASEM), science and engineering professional societies, think tanks, and lobbyists. Some congressional offices also employ staff with S&T backgrounds.

Since the closure of OTA, concerns have been raised about gaps in S&T advice available to Congress. A variety of efforts have been made to close these gaps, most notably by expanding GAO's technology assessment function. However, many consider these measures to be insufficient and remain concerned about Congress's ability to address the challenges of an increasingly technological world and to provide a check on the activities of the Executive Branch.

The debate over how to meet Congress's need for S&T advice has intensified in recent years. While Congress has expressed support for enhancing its access to S&T expertise, the House and Senate appear divided on how to achieve that goal. In its FY 2020 Legislative Branch Appropriations report the Senate included support for enhancing the capabilities at GAO, while the House report includes funding for a renewed OTA. A highly-anticipated 3rd party assessment of options for meeting Congress's needs was released in November. The congressionally-mandated National Academy of Public Administration (NAPA) report confirms the existence of a gap in S&T advice for Congress and recommends a hybrid approach for closing that gap.

BACKGROUND

Office of Technology Assessment

Congress created the Office of Technology Assessment (OTA) in 1972 to aid Congress "in the identification and consideration of existing and probable impacts of technological application."[1] As a dedicated congressional support agency, OTA provided Congress with objective and authoritative analysis of science and technology issues to inform policy decisions. It was governed by the twelve-member Technology Assessment Board (TAB), populated with six members of Congress from each party – half from the Senate and half from the House of Representatives. Technology assessments were approved by the TAB and could be requested by committee leadership, a majority of committee members, the TAB, or the OTA Director.

At its peak, OTA had a staff of approximately 200 and a budget of about $22 million annually ($37 million today).[2] Between 1972 and 1995, OTA produced over 750 studies (an average of about 30 per year) on a broad set of technology issues, including those relevant to agriculture, intellectual property, defense, public health, energy, and the environment.[3] On average, OTA studies took 1-2 years to produce. OTA reports generally did not offer policy recommendations, but rather evaluated the implications of various policy options.

Funding for OTA was eliminated in 1995 as part of an effort to reduce the size of the congressional budget and bureaucracy. Arguments made by proponents of eliminating OTA included (1) OTA reports took over a year to complete and, therefore, were not available in a timeframe aligned with the legislative process, (2) Congress could obtain similar advice from GAO, NASEM, and CRS, and (3) some OTA reports were not pertinent to the legislative agenda or reflected a political bias. Some have also argued that the lack of access to OTA services by rank-and-file Members suppressed support for the office, making it politically vulnerable. While OTA has not been funded since 1995, its authorizing statute remains in effect.

Since it was defunded, there have been various efforts to revive and modernize the OTA. The House voted in June 2018 on an appropriations amendment[4] that would have funded the office with an initial budget of $2.5 million, but it failed 195-217.

This year, the bipartisan Select Committee on the Modernization of Congress in the House unanimously approved a recommendation for "reestablishing and restructuring an improved Office of Technology Assessment."[5] The House Appropriations Committee voted along party lines to approve a FY 2020 Legislative Branch Appropriations bill that includes $6 million to

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[1] OTA was created by the Technology Assessment Act of 1972 (2 U.S.C. 471) http://www.princeton.edu/~ota/ns20/act_f.html

[2] Equivalent to less than 1 percent of the legislative branch budget.

[3] Princeton, "OTA Publications," https://www.princeton.edu/~ota/ns20/year_f.html

[4] https://amendments-rules.house.gov/amendments/TAKANO_061530180942394239.pdf

[5] Select Committee on the Modernization of Congress, "Select Committee Unanimously Approves Second Round of Congressional Recommendations," July 25, 2019, https://modernizecongress.house.gov/news/press-releases/select-committee-unanimously-approves-second-round-congressional-recommendations

reestablish an OTA that will "complement the work of the Government Accountability Office in the area of science and technology."[6] In September, bipartisan, bicameral legislation was introduced by Representative Mark Takano (D-CA) and Senator Thom Tillis (R-NC) to amend the authorizing statute for OTA and revise the office's functions and duties.[7]

Government Accountability Office

Seven years after OTA closed, Congress directed GAO to initiate a pilot program in technology assessment (TA).[8] In 2007, Congress authorized this function on a permanent basis and provided $2.5 million in appropriations to support it, stating "it is necessary for the Congress to equip itself with effective means for securing competent, timely and unbiased information concerning the effects of scientific and technical developments and use the information in the legislative assessment of matters pending before the Congress."[9] GAO has since expanded its TA activities, standing up a Science, Technology Assessment, and Analytics (STAA) team in January 2019 and releasing a plan to further enhance its TA capabilities in April 2019.[10]

To date, GAO has published 15 technology assessments on topics such as border security, cybersecurity, nuclear reactors, sustainable chemistry, artificial intelligence, and agriculture.[11] GAO's TA work is subject to congressional request and adheres to the same congressional protocols as its other work. GAO gives congressional mandates top priority, followed by requests from congressional and committee leadership. Individual Member requests are prioritized last.[12]

GAO is taking a number of steps to build on its existing capabilities with a focus on (1) growing the STAA team, (2) developing additional product types and formats, (3) designating staff with a primary TA focus, (4) continuing engagement with external experts, and (5) developing policy options to aid in congressional decision-making. In addition to TA, the STAA team plans to provide technical assistance, oversight of Federal S&T programs, and best practices guides. Most notably, the STAA team plans to identify and analyze policy options, when relevant, in future technology assessments. Currently, the team is focusing on artificial intelligence and automation, augmented reality, cryptocurrencies and blockchain, genome editing, and quantum information

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[6] H. Rept. 116-64, "Legislative Branch Appropriations Bill, 2020", May 16, 2019, https://www.congress.gov/congressional-report/116th-congress/house-report/64/1?overview=closed
[7] H.R. 4426, "Office of Technology Assessment Improvement and Enhancement Act", September 19, 2019, https://www.congress.gov/bill/116th-congress/house-bill/4426/cosponsors
[8] H. Rept. 107-259, "Making Appropriations for the Legislative Branch for the Fiscal Year Ending September 30, 2002, and for other purposes," October 30, 2001, https://www.congress.gov/congressional-report/107th-congress/house-report/259/1
[9] H. Rept. 110-198, "Legislative Branch Appropriations Bill, 2008," June 19, 2007, https://www.congress.gov/congressional-report/110th-congress/house-report/198/1
[10] GAO, "GAO Science, Technology Assessment, and Analytics Team: Initial Plan and Considerations Moving Forward," April 10, 2019, https://www.gao.gov/pdfs/about/GAOScienceTechPlan-2019-04-10.pdf
[11] GAO, "Technology and Science," https://www.gao.gov/technology_and_science#t=1
[12] GAO, "GAO's Congressional Protocols," July 17, 2017, https://www.gao.gov/assets/690/685901.pdf

science. GAO also plans to establish a science and technology advisory board of policy experts from academia, industry, non-profits, and prior government officials.

The STAA team does not have its own staff of dedicated technical specialists and policy analysts, but rather utilizes shared staff from across GAO. The team is divided into four core groups (Technology Assessment and Technical Assistance; Engineering Sciences; Science and Technology Program Oversight; and Innovation Lab) and is headed by two managing directors, Dr. Tim Persons (GAO's Chief Scientist) and Dr. John Neumann. GAO anticipates the need to grow the STAA team from its current staffing level of 49 to 140 full-time staff. To help meet project-specific needs, GAO is considering options for adding limited term staff, such as interns, fellows, and Intergovernmental Personnel Act (IPA)[13] detailees.

The Analysis Gap

Advocacy groups and policy experts from both sides of the aisle have raised concerns about the lack of a dedicated source of scientific and technical advice and assessment for Congress. They argue that the resources currently available do not provide Congress with in-depth and forward-looking analysis, including analysis of multiple policy options, in a form and on a schedule that is useful to legislators.[14,15,16,17,18,19] A 2016 survey found that only 24 percent of House and Senate senior staff said that they were very satisfied with congressional access to "high-quality, nonpartisan policy expertise", despite 81 percent saying they found this access to be "very important" to their duties.[20] Many also point to Congress's inability to absorb the vast quantities of information to which it has access.

Over the last 24 years, congressional support agencies and NASEM have filled in some gaps but they have thus far been unable to fulfill all elements of OTA's mission. Whereas OTA evaluated

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[13] The Intergovernmental Personnel Act Mobility Program provides for the temporary assignment of personnel between the Federal Government and state and local governments, colleges and universities, Indian tribal governments, federally funded research and development centers, and other eligible organizations. https://www.opm.gov/policy-data-oversight/hiring-information/intergovernment-personnel-act/

[14] Center for American Progress, "Congress Should Revive the Office of Technology Assessment," May 13, 2019, https://www.americanprogress.org/issues/green/news/2019/05/13/469793/congress-revive-office-technology-assessment/

[15] Bipartisan Policy Center, "Congress Needs the Office of Technology Assessment to Keep up with Science and Technology," July 25, 2019, https://bipartisanpolicy.org/report/congress-needs-the-office-of-technology-assessment-to-keep-up-with-science-and-technology/

[16] R Street Institute, "Bring in the nerds: Reviving the Office of Technology Assessment," January 24, 2018, https://www.rstreet.org/wp-content/uploads/2018/04/Final-128-1.pdf

[17] American Action Forum, "Should Congress Revive the Office of Technology Assessment?" October 29, 2018, https://www.americanactionforum.org/insight/should-congress-revive-the-office-of-technology-assessment/

[18] Belfer Center, "Building a 21st Century Congress: Improving Congress's Science and Technology Expertise," September 2019, https://www.belfercenter.org/publication/building-21st-century-congress-improving-congresss-science-and-technology-expertise

[19] AEI, "Congress should revive the Office of Technology Assessment," December 6, 2018, https://www.aei.org/articles/congress-should-revive-the-office-of-technology-assessment/

[20] Congressional Management Foundation, "State of the Congress: Staff Perspectives on Institutional Capacity in the House and Senate," August 8, 2017, http://www.congressfoundation.org/projects/resilient-democracy-coalition/state-of-the-congress

a host of policy implications, the Congressional Budget Office (CBO) is primarily concerned with the economic impact of proposed policies.[21] Due to its broad mandate, the Congressional Research Service (CRS) has limited staff with STEM backgrounds.[22] GAO does not provide forward looking analysis to alert Congress of emerging science and technology issues. GAO also lacks the in-house expertise that OTA had, which limits its capacity to provide informal advice on short notice. Notably, CRS and GAO staffing have decreased by 17 and 31 percent, respectively, since OTA closed.[23,24] Finally, some have expressed concern about the differences between GAO's traditional audit and program evaluation culture and the culture needed for effective TA.

NASEM must be funded by a Federal agency to perform work for Congress, which can at times be a source of friction. The Academies is also not accustomed to assessing policy options, but rather developing policy recommendations by consensus. Finally, an Academies report takes one to two years to complete, a timeline that is not well aligned with the legislative cycle.

NAPA Report

The congressionally-mandated NAPA report was published on November 14, 2019.[25] The study committee identified gaps in the areas of "networking, consultative support, short- and medium-term S&T-related reports" and "S&T horizon scanning."

The study committee recommended that Congress should not stand up an OTA-like entity within the legislative branch, but instead should provide GAO and CRS with the authority and resources to build their S&T capacity and create an S&T advisory office and a coordinating council to bolster the cooperation and communication between GAO and CRS. The committee also recommends that Congress assess the outcome of these efforts 24 months after implementation.

The advisory office, called the Office of the Congressional Science and Technology Advisor (OCSTA), would be headed by a Congressional S&T Advisor and mandated with "expanding the S&T capacity of the Congress." The S&T Advisor, appointed by House and Senate leaders should be an "eminent individual, widely recognized and respected across the S&T community encompassing government, academia, and industry" and would "work collaboratively with congressional leaders, committee chairs, and key staffs to identify ways to improve Congress' ability to address S&T issues, with a particular focus on enhancing the capacity of Congress to absorb and utilize the S&T support available from the GAO and the CRS as well as external resources." OCSTA would also be charged with horizon scanning for emerging S&T trends through contract with external organizations.

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[21] CBO, "10 Things to Know About CBO," February 14, 2019, https://www.cbo.gov/about/10-things-to-know
[22] CRS, "History and Mission," November 15, 2012, https://www.loc.gov/crsinfo/about/history.html
[23] LOC, "Fiscal Year 2020 Budget Justification," https://www.loc.gov/static/portals/about/reports-and-budgets/documents/budgets/fy2020.pdf
[24] GAO, "Fiscal Year 2020 Budget Request," February 27, 2019, https://www.gao.gov/assets/700/697133.pdf
[25] NAPA, "Science and Technology Policy Assessment: A Congressionally Directed Review," November 14, 2019, https://www.napawash.org/studies/academy-studies/science-and-technology-policy-assessment-for-the-us-congress

The study committee did assess an alternative option in which a new OTA-like congressional entity is established to "focus on medium-term S&T studies and horizon scanning studies for Congress" while CRS strengthens its S&T capabilities and GAO continues to enhance its STAA team. While the committee rated the "desirability" of this option as "high", it rated the "viability" as "low" and "feasibility" as "medium", citing potential vulnerability to political challenges, the difficulty in gathering "sufficient resources and political support", and the potential for duplication of effort with CRS and GAO.

While the study committee acknowledged that standing up an advisory office like OCSTA "is likely to be challenging given the current congressional environment," they state without explanation that "it should be less difficult than creating an entirely new agency." The committee did not address the potential for OCSTA to be vulnerable to political challenges.