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R STREET POLICY STUDY NO. 128
January 2018

BRING IN THE NERDS: REVIVING THE OFFICE OF TECHNOLOGY ASSESSMENT

Zach Graves and Kevin Kosar

EXECUTIVE SUMMARY

Recent decades have brought astonishing developments in technology. The Internet, smartphones, cloud computing and geolocation—to name only a few—have transformed our daily lives, propelled global improvements to the human condition and solidified America’s top position in the global economy.¹

What’s more, this “innovation revolution” is not over.² In the decades to come, we expect to see additional breakthrough advances in artificial intelligence, autonomous transportation, advanced manufacturing and health technology, as well as in areas we are not yet able to anticipate.

1. The World Bank, “World Development Indicators,” *Databank*, 2018. <http://databank.worldbank.org/data/reports.aspx?source=world-development-indicators>.

2. Tyler Cowen, “Is Innovation Over?,” *Foreign Affairs*, Feb. 15, 2016. <https://www.foreignaffairs.com/reviews/review-essay/2016-02-15/innovation-over>.

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Without a doubt, these developments will create new challenges and externalities, and will emerge in ways that disrupt existing legal frameworks, social norms and incumbent industries.³ If unchecked, panic and backlash over such disruptions (whether real or imagined) will lead to heavy-handed laws and regulations or harmful carve-outs that will depress the social and economic benefits of innovation. Additionally, if the overall regulatory climate becomes too hostile, America’s innovators and investors are increasingly able to pick up and go elsewhere.⁴

Despite the social and economic importance of science and innovation, policymakers are not always well equipped to understand and meet the associated challenges head-on. This problem is particularly conspicuous in the United States Congress, which serves an essential function through the crafting of legal frameworks for new technologies.

Following short-sighted reforms in the mid-1990s that were built around “Cutting Congress First,”⁵ the First Branch has lacked the staffing and expertise to handle the increasingly technical nature of contemporary science and technology debates. These cuts included an overall reduction in congressional staff, as well as the outright elimination of the Office of Technology Assessment (OTA) – an expert advisory agency that served as a think tank within Congress from 1972 to 1995, and made important contributions to shaping technology policy in the United States and abroad.

Accordingly, this paper assesses what Congress needs to strengthen its ability to understand and engage in these debates, and discusses the role of the legislative branch’s expert advisory agencies and the current state of congressional capacity. It then examines the history and politics of the OTA and its former impact, presents arguments for and

3. This also happened for past innovations like the telegraph, telephone, cameras and caller ID. See, e.g., Adam Thierer, *Permissionless Innovation* (Mercatus Center, 2017), pp. 69-71.

4. As Adam Thierer observes, we live in a world of “global innovation arbitrage,” p. 56.

5. Bruce Bimber, *The Politics of Expertise in Congress* (State University of New York Press, 1996), p. 77.

against its revival, and evaluates its political viability to argue that in order to build the capacity to successfully meet the next wave of technology policy debates, Congress needs to revive the in-house expertise and in-depth research functions of the Office of Technology Assessment.

INNOVATION, DISRUPTION AND PUBLIC POLICY

Technology-driven disruptions are happening all around us. These create new challenges for policymakers who must decide how to assess their impact, anticipate their externalities and determine whether new legislative or regulatory action is justified. For instance, the rise of the Internet of Things (IoT) introduced new cybersecurity vulnerabilities, which have raised policy questions about how best to mitigate botnet attacks and other cyber risks. The rise of transportation network companies like Uber and Lyft, as well as other gig economy platforms like ThumbTack and TaskRabbit, have highlighted the need to update our worker classification and benefits laws.⁶ In 2013, mail-order genetic testing company 23andMe found itself in hot water with the Food and Drug Administration for not asking permission before giving users a simple analysis of disease-risk.⁷ This illustrates how advanced health tech applications – such as using large data sets and artificial intelligence for diagnosis – will require us to rethink how we apply our current health policy regime if we want to reap their benefits.

Legal and regulatory frameworks, as well as the norms and attitudes of policymakers in adapting them, are a matter of life and death for innovators. That is, in order to foster investment and entrepreneurship, policymakers need to give them the proverbial “green light.”⁸ Sometimes this means little more than communicating positive statements and rhetoric. Other times, it means putting in place forward-looking legislation or regulation to set new “rules of the road” or to clarify how legacy rules apply in new situations.⁹

In an ideal world, policymakers would approach these kinds of issues with a nuanced understanding of the technical complexities involved, while contemplating the potential tradeoffs of different actions. In reality, however, that is not

always the case. And indeed, it does not take much effort to find embarrassing knowledge gaps among our lawmakers, such as the worry that Guam will tip over and fall into the sea,¹⁰ or a comparison of the Internet to a “series of tubes.”¹¹ But cheap shots aside, the expertise deficit between Silicon Valley and Washington is both real and severe, and this asymmetry and frustrations around it increase the likelihood of adverse policy outcomes. Accordingly, the following sections detail three recent examples.

Online piracy

In 2011, the fight over two anti-piracy bills set Hollywood against tech companies and Internet advocates. These were the PROTECT IP Act (PIPA) in the Senate, and the Stop Online Piracy Act (SOPA) in the House of Representatives. Upon introduction in both cases, it soon became clear that proponents did not fully understand the implications of such legislation in areas like cybersecurity. For example, Stewart Baker, former Department of Homeland Security assistant secretary and National Security Agency (DNSSEC) general counsel, slammed SOPA for undermining the “fragile consensus” that the government had worked to build around the DNSSEC.¹² Further, during the bill’s markup in the House Judiciary Committee, then-Rep. Jason Chaffetz (R-Utah) remarked that Congress was making drastic changes to the Internet without having any idea what it was doing: “We’re basically going to reconfigure the internet...without bringing in the nerds.”¹³ Although the bills ultimately failed due to fierce public backlash and later opposition from the Obama administration, the lack of engineering or cybersecurity expertise in Congress undeniably contributed to the problem. Today, little has changed, and frustrations continue over structural inefficiencies and irregular fair use protections in online copyright enforcement.¹⁴

Commercial encryption

The rise of commercial encryption in the late-20th century also tested congressional capacity for tackling technical challenges. Throughout its development, intelligence and law enforcement communities worried that commercial encryption would adversely affect their ability to do their

6. Eli Lehrer, “The Future of Work,” *National Affairs*, Summer 2016. <https://www.nationalaffairs.com/publications/detail/the-future-of-work>.

7. U.S. Food and Drug Administration, “Document Number: GEN1300666 Re: Personal Genome Service (PGS),” U.S. Dept. of Health and Human Services, Nov. 22, 2013 <https://www.fda.gov/ICECI/EnforcementActions/WarningLetters/2013/ucm376296.htm>.

8. Thierer, p. 10.

9. Past examples of positive legal frameworks include policies such as Section 230 of the Communications Decency Act, the Electronic Communications Privacy Act, the Internet Tax Freedom Act and the Clinton administration’s Framework for Global Economic Commerce. Examples of the need to clarify or update legacy standards include worker classification in the gig economy, federal vs. state roles in regulating autonomous vehicles, insurance and liability in ridesharing, promoting cybersecurity best practices, clarifying exemptions for cybersecurity vulnerability research and updating state money transmission laws for cryptocurrencies.

10. David Mikkelsen, “Guam Reaches the Tipping Point?,” *Snopes*, August 9, 2017. <https://www.snopes.com/politics/quotes/guamtip.asp>.

11. “Your own personal internet,” *Wired*, June 30, 2006. https://www.wired.com/2006/06/your_own_person.

12. Stewart Baker, “Finding Fault with the Stop Online Piracy Act,” *Volokh Conspiracy*, Nov. 18, 2011. <http://volokh.com/2011/11/18/finding-fault-with-the-stop-online-piracy-act>.

13. David Moon et al., eds., *Hacking Politics: How Geeks, Progressives, The Tea Party, Gamers, Anarchists and Suits Teamed up to Defeat SOPA and Save the Internet* (OR Books, 2013), pp. 136-38.

14. See, e.g., “Section 512 Study,” U.S. Copyright Office, Nov. 8, 2016. https://www.regulations.gov/document?D=COLC_FRDOC_0001-0018.

jobs. In the ensuing crypto wars, government agencies and lawmakers have made various attempts to limit access to the technology, to weaken encryption standards¹⁵ and build in backdoors.¹⁶ So far, the most ill-advised of these proposals have been defeated. And, over the past few decades, this has allowed the technology to become the default protection of our data and communications, and to assist in the global competitiveness¹⁷ and spread of U.S. technology.¹⁸ While the intelligence community has largely adapted to the rise of encryption,¹⁹ law enforcement officials continue to sound the alarm over capabilities they are gradually losing.²⁰ For this reason, in 2016, Sen. Richard Burr (R-N.C.) and Sen. Dianne Feinstein (D-Calif.) introduced a major legislative proposal to address the concerns of law enforcement.²¹ Yet, their proposal was panned by industry groups,²² cybersecurity experts and civil society groups for being overly broad and technically illiterate.²³ Indeed, if the Burr-Feinstein proposal had become law, it would have been devastating for the U.S. technology sector. Today, the crypto debate continues, and we are left with unanswered questions, such as how law enforcement can adapt, how significant the “going dark” problem is,²⁴ and how to structure policies that will best satisfy public safety, civil liberties and commercial interests.

15. Whitfield Diffie and Martin E. Hellman, “Exhaustive Cryptanalysis of the NBS Data Encryption Standard,” *Computer Society*, June 1977. <https://web.archive.org/web/20140226205104/http://origin-www.computer.org/csdl/mags/co/1977/06/01646525.pdf>.

16. Steven Levy, “Battle of the Clipper Chip,” *The New York Times*, June 12, 1994. <https://nyti.ms/15H0Px4>.

17. Note, for instance, the recent backlash against Kaspersky and Huawei for allegedly sharing data with Russia and China (respectively). See e.g., Nicholas Fearn, “US law makers turn their attention from Kaspersky to Huawei, urging AT&T to ditch Huawei equipment,” *Computing*, January 16, 2018. <https://www.computing.co.uk/ctg/news/3024496/us-law-makers-turn-their-attention-from-kaspersky-to-huawei-urging-at-t-to-ditch-huawei-equipment>.

18. OTA played an expert advisory role in the early policy debates around encryption, and produced several reports on the subject. See <http://ota.fas.org/otareports>.

19. Ellen Nakashima, “Former national security officials urge government to embrace rise of encryption,” *The Washington Post*, Dec. 15, 2015. https://www.washingtonpost.com/world/national-security/former-national-security-officials-urge-government-to-embrace-rise-of-encryption/2015/12/15/3164eae6-a27d-11e5-9c4e-be37f66848bb_story.html.

20. “Wiretap Report 2016,” United States Courts, Dec. 31, 2016. <http://www.uscourts.gov/statistics-reports/wiretap-report-2016>.

21. “Draft Bill: The Compliance with Court Orders Act of 2016,” 114th Congress. http://www.feinstein.senate.gov/public/_cache/files/5/b/5b990532-cc7f-427f-9942-559e73eb8bfb/6701CF2828167CB85F51D12F7CB69D74.bag16460.pdf.

22. Reform Government Surveillance et. al., “Joint Letter to Feinstein and Burr on Encryption Legislation,” Internet Infrastructure Coalition, April 20, 2016. <https://www.i2coalition.com/joint-letter-to-feinstein-and-burr-on-encryption-legislation>.

23. Andy Greenberg, “The Senate’s Draft Encryption Bill Is ‘Ludicrous, Dangerous, Technically Illiterate,’” *Wired*, April 8, 2016. <https://www.wired.com/2016/04/senates-draft-encryption-bill-privacy-nightmare>.

24. “Going dark” is a term used by law enforcement to refer to their loss of capabilities in light of the proliferation of encryption and other device-security technologies.

Autonomous transportation

Already deployed in pilot programs such as Waymo’s early rider program in Phoenix,²⁵ the rise of self-driving cars is currently testing how policymakers untangle fears over transformative technologies. Thus far, state legislatures have struggled to define the subject matter to be regulated,²⁶ instead delegating responsibilities to bodies with relevant expertise and establishing their roles.²⁷ But beyond figuring out how to apply traditional automotive regulatory considerations such as safety, liability and licensure in a new context, policymakers are confronted with other fears such as mass labor displacement, fleets of hacked cars and unique ethical dilemmas.²⁸

Even when unfounded, technology-driven fears and the moral panics that follow them promote the adoption of bad policies.²⁹ Even if society quickly adapts as it has in the past,³⁰ the consequences of reactionary policymaking can linger for decades or even centuries – chilling the transformative potential of innovation.

For instance, autonomous vehicles promise to drastically reduce the number of fatal accidents – of which 94% are caused by human error.³¹ But, as Ryan Calo notes, they are also likely to introduce new kinds of errors that humans do not typically make like swerving to avoid a shopping cart and hitting a stroller.³² Even if the technology is objectively safer overall, outrage over these kinds of mishaps could put a tremendous amount of pressure on policymakers to shut it down.

25. John Krafcik, “Apply to be part of Waymo’s early rider program,” *Medium*, April 24, 2017. <https://medium.com/waymo/apply-to-be-part-of-waymos-early-rider-program-5fd996c7a86f>.

26. Nevada’s 2011 autonomous vehicle law defined the subject of its regulation as technology that can “enable a machine to duplicate or mimic” human behavior. This definition was overly broad, however, as it encompassed a variety of conventional features like cruise control and collision avoidance systems. See: NRS § 482A.020 (repealed). <https://law.justia.com/codes/nevada/2011/chapter-482a/statute-482a.020>.

27. “Comments of the R Street Institute et al. to the California Department of Motor Vehicles,” OAL File Number Z-2017-0227-02, April 24, 2017. <http://2o9ub0417ch12lq6m43em6psi2i.wengine.netdna-cdn.com/wp-content/uploads/2017/04/RSI-Coalition-CA-AV-Proposed-Reg-Comments-170424-FINAL.pdf>.

28. “Moral Machine,” Massachusetts Institute of Technology, 2018. <http://moralmachine.mit.edu/>.

29. See, e.g., Adam Thierer, “Technopanics, Threat Inflation, and the Danger of an Information Technology Precautionary Principle,” *Minnesota Journal of Law, Science and Technology* 14:1 (Winter 2013), pp. 311-85. https://www.mercatus.org/system/files/Technopanics-by-Adam-Thierer_MN-Journal-Law-Science-Tech-Issue-14-1.pdf.

30. *Permissionless Innovation*, pp. 69-71.

31. “Critical Reasons for Crashes Investigated in the National Motor Vehicle Crash Causation Survey,” National Highway Traffic Safety Administration, February 2015. <https://crashstats.nhtsa.dot.gov/Api/Public/ViewPublication/812115>.

32. Ryan Calo, “The case for a federal robotics commission,” *The Brookings Institution*, Sept. 14, 2014. <https://www.brookings.edu/research/the-case-for-a-federal-robotics-commission>.

More broadly, concerns about job loss from automation have prompted calls for policy responses like taxing robots³³ – which lawmakers in California are considering³⁴ – despite compelling evidence that robots are good for economic growth and augment labor productivity, as well as a lack of compelling evidence that robots drive mass unemployment.³⁵ In Congress, labor unions have exploited this fear, successfully lobbying to exclude trucks from pending autonomous vehicle bills, which would restrict a valuable use case for the technology and limit future economic gains.³⁶

The cost of instituting a hostile legal framework for any one of the above three issues, not to mention countless others not contemplated here, would be disastrous. To avoid these nightmare scenarios, lawmakers need the confidence to resist reactionary thinking. One way we can encourage this is to make sure they have the capacity and access to expertise to make informed, reasoned decisions when contemplating the impacts of new technologies or enacting relevant legislation.

CONGRESS AND TECHNOLOGICAL EXPERTISE

Innovations in science and technology and the legal frameworks that govern them have contributed to unprecedented social and economic progress.³⁷ Indeed, assessing these advances and adapting policies around them is an essential function for U.S. policymakers. Perhaps because information and communications technologies (ICTs) are inherently interjurisdictional,³⁸ the most important of these debates seem to happen at the national level.³⁹ And while the judiciary and executive play important roles in interpreting and enforcing existing laws, it ultimately falls upon Congress to build and update the appropriate legal frameworks and to oversee their implementation.

In any given session week, Congress will convene hearings on an array of technical subjects that span multiple committees and subcommittees in each chamber. These might

include issues such as foreign intervention in elections, countering violent extremism on social media platforms, combating antibiotic resistant diseases, evaluating renewable energy programs or modernizing the government's IT infrastructure.

Yet, as the number and complexity of policy issues have climbed during the past two decades, Congress' technical capacity has decreased. Few elected legislators themselves have professional backgrounds in technology or science, as most members worked in the fields of law, business and banking.⁴⁰ And the processes for selecting the members of the committees values alignment between an individual legislator's expertise and a committee's policy jurisdiction very little. Rather, members are assigned committee and subcommittee chairmanships and seats through complex processes that consider a bevy of variables (e.g., other committee seats held, fundraising and/or individual legislator interest).⁴¹ For this reason, generally speaking, members of Congress must learn technology policy on the job and are heavily reliant on their staffs to do so.

Unfortunately, there is also little evidence to suggest that congressional staff have any deep expertise in technological or scientific issues. In part, this is because roughly 40 percent of Capitol Hill staff are under 24 years of age and staff turnover is high, which inhibits the development of expertise.⁴²

Making matters more difficult, the total number of Capitol Hill staff has declined since 1987, particularly in the House of Representatives.⁴³ And half of the current congressional staff works outside Washington, devoting themselves mostly to local and constituent issues rather than policy.⁴⁴

Given their limited resources and fast-paced legislative calendar, congressional offices do not always have the capacity to understand and tackle technological and scientific issues on their own, and therefore must seek outside expertise.

33. Rob Seamans, "No, Robots Should Not Be Taxed," *Forbes*, March 3, 2017. <https://www.forbes.com/sites/washingtonbytes/2017/03/03/no-robots-should-not-be-taxed>.

34. Catherine Clifford, "Automation could kill 2x more jobs than the Great Depression—so San Francisco lawmaker pushes for Bill Gates' robot tax," *CNBC*, Aug. 24, 2017. <https://www.cnbc.com/2017/08/24/san-francisco-lawmaker-pushes-forward-bill-gates-robot-tax.html>.

35. Georg Graetz and Guy Michaels, "Robots at Work," *IZA Discussion Paper* No. 8938, April 6, 2015. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2589780.

36. S.1885, "AV Start Act," 115th Congress

37. Notably, America's most valuable companies are all technology companies. See, e.g., "A Century of America's Top 10 Companies, in One Chart," *howmuch*, Nov. 14, 2017. <https://howmuch.net/articles/100-years-of-americas-top-10-companies>.

38. While there are many important innovations that are not ICT-related, advances related to data and communications—and the hardware that supports them—feature prominently in technology policy discussions.

39. Of course, state and local policymakers play a major role in issues like the sharing economy and insurance technology ("insurtech"), and many issues (like autonomous vehicles or drones) also involve interplays between federal and state authorities.

40. *Representatives and Senators: Trends in Member Characteristics Since 1945*, Congressional Research Service, Jan. 27, 2014, pp. 6-9. https://www.everycrsreport.com/files/20140127_R42365_a976eb164a1400b19ff6244b7ff25ed6d1b8f669.pdf.

41. See, e.g., "Committee FAQs," Office of the Clerk, House of Representatives, 2018. http://clerk.house.gov/committee_info/commfaq.aspx; and *Committee Assignment Process in the U.S. Senate: Democratic and Republican Party Procedures*, Congressional Research Service, Nov. 3, 2006. https://www.everycrsreport.com/files/20061103_RL30743_70b3cb5b6586f8b3b6144bb76233eec4e1f34910.pdf.

42. Age data mined from <http://legistorm.com/>. On the length of congressional staff tenures, see the Congressional Research Service reports listed at <https://www.everycrsreport.com/reports/R44688.html>. Low pay, long and unpredictable work hours, and the rancorous partisan environment discourage long staff tenures.

43. Kevin R. Kosar, "How many congressional staff are there?," *LegBranch.com*, June 21, 2016. <http://www.legbranch.com/theblog/2016/6/17/what-are-house-and-senate-committee-staffing-levels>.

44. Kevin R. Kosar, "How to strengthen Congress," *National Affairs*, Fall 2015. <https://www.nationalaffairs.com/publications/detail/how-to-strengthen-congress>.

Some help can be found within the legislative branch.⁴⁵ The Congressional Research Service (CRS), often thought of as “Congress’ think tank,” has civil servants who are learned on some science and technological issues and are available for consultation to Congress.⁴⁶ For all of its virtues, however, CRS has very limited capacity to assist Congress on technological issues. This is because its corps of employees with deep knowledge are limited in number⁴⁷ and the agency invests little in their continuing education.⁴⁸ With far too few experts to cover the myriad technological topics facing Congress, individual CRS analysts tend to be stretched thin and usually are not able to engage in the kind of lengthy, “deep-dive” analysis that is useful in policymaking decisions.

For this reason, Congress heavily relies upon the executive branch and non-governmental organizations to school it on technological and scientific issues. Certainly, it is a very good thing and is perfectly in keeping with our system of government for our national legislature to solicit and heed outside advice, as policy-relevant knowledge – like all knowledge – is dispersed among individuals.⁴⁹ What is problematic, however, is that the information transferred to Congress by these outsiders is complex and inevitably biased. For example, while advocates for net neutrality have made various complex arguments in its favor, opponents of the policy have made equally sophisticated arguments to the contrary. Similarly, executive agencies inevitably have their own perspectives on technological issues. Sorting through this barrage of information to make reasoned choices requires expertise that Congress only sometimes possesses directly. Additionally, there is the matter of accountability. A legislature cannot hold executive agencies accountable for their technological policies, programs and activities if it cannot comprehend and assess the technologies, or if it is forced to rely heavily on the agencies’ assessments for its information. Indeed, even independent agencies shift their positions over time and with changing political tides, as in the recent case of the Federal Communications Commission’s stance on net neutrality.

45. No mention is made here of the Government Accountability Office, Library of Congress or Congressional Budget Office because these legislative branch agencies are not staffed to advise Congress on scientific or technological issues. One exception is the U.S. Copyright office, which is within the Library of Congress and advises on science and technology issues that relate specifically to copyright policy.

46. A sense of the sorts of reports that CRS produces on scientific and technological topics can be found in its annual report. The most recent copy is publicly available at: <https://archive.org/details/CongressionalResearchServiceAnnualReportFy2016>.

47. CRS’ total staff count has fallen by more than 20 percent since 1980. See, e.g., “How to strengthen Congress.” <https://www.nationalaffairs.com/publications/detail/how-to-strengthen-congress>.

48. For example, a CRS analyst or specialist who assists Congress with cyber warfare issues is highly unlikely to be detailed to an executive agency (e.g., the Department of Defense) or permitted to take a sabbatical to work for a private sector company with expertise in hacking or malware detection.

49. Friedrich Hayek, “The Use of Knowledge in Society,” *American Economic Review* 35:4 (September 1945), pp. 519–30. <http://home.uchicago.edu/~vljima/courses/econ200/spring01/hayek.pdf>.

To be clear, as Professor Tom Nichols has written, the expertise gap between citizen legislators and the private sector can never be closed entirely:

The United States is a republic, in which the people designate others to make [governance] decisions on their behalf. Those elected representatives cannot master every issue [...] Experts advise. Elected leaders decide.⁵⁰

The gap, however, can be shrunk, which can produce better informed policy and more accountable government. One of the most direct ways to improve Congress’ technical ability is to enhance its internal resources and capacity for producing deep objective analysis. And, in fact, forty-five years ago, Congress hatched a small agency of nerds to do just this.

THE RISE AND FALL OF THE OFFICE OF TECHNOLOGY ASSESSMENT

The Office of Technology (OTA) was enacted by Congress in 1972.⁵¹ The founding of the agency,⁵² the mission of which was to provide lawmakers with the expertise to confront an expanding field of technological challenges, arose out of a decade and a half of dialogue within Congress over its capabilities to assess new technologies and to meet the associated challenges.⁵³

In operation for over two decades, the OTA produced nearly 750 assessments, background papers and other research products.⁵⁴ Its highly credentialed, civil servant staff also were available to advise committees and individual legislators.

As the agency’s name implies, the OTA’s basic function was “to provide early indications of the probable beneficial and adverse impacts of the applications of technology and to develop other coordinate information which may assist the Congress.”⁵⁵ To do these things, the law further directed the OTA to:

(1) identify existing or probable impacts of technology or technological programs;

50. Tom Nichols, *The Death of Expertise: The Campaign Against Established Knowledge and Why It Matters* (Oxford University Press, 2017), p. 11.

51. 86 Stat. 797; 2 U.S.C. § 471. <https://www.gpo.gov/fdsys/pkg/STATUTE-86/pdf/STATUTE-86-Pg797.pdf>.

52. Pub. L. 92-484. <https://www.gpo.gov/fdsys/pkg/STATUTE-86/pdf/STATUTE-86-Pg797.pdf>.

53. Peter D. Blair, *Congress’s Own Think Tank*, (Palgrave Macmillan, 2013), pp. 11-17.

54. Office of Technology Assessment, “Annual Report to Congress: Fiscal Year 1995,” U.S. Congress, March 1996. <http://ota.fas.org/reports/9600.pdf>. The Federation of American Scientists maintains an archive of the OTA’s research, which can be found at: <http://ota.fas.org/>.

55. 2 U.S.C. § 472

- (2) where possible, ascertain cause-and-effect relationships;
- (3) identify alternative technological methods of implementing specific programs;
- (4) identify alternative programs for achieving requisite goals;
- (5) make estimates and comparisons of the impacts of alternative methods and programs;
- (6) present findings of completed analyses to the appropriate legislative authorities;
- (7) identify areas where additional research or data collection is required to provide adequate support for the assessments and estimates described in paragraph (1) through (5) of this subsection; and
- (8) undertake such additional associated activities as the appropriate authorities specified under subsection (d) may direct.⁵⁶

It was a narrowly focused mandate: study emergent technologies and advise Congress about their potential impact. Notably absent from its statutory duties was advising Congress on how to legislate. Although they often advised on the pros and cons of different policy approaches, it was not the OTA's job to tell Congress which policies to support in the way that the Heritage Foundation or the Center for American Progress might. Instead, its primary role was to conduct independent research into the technology itself and advise Congress as to how it works and its likely impacts.

The OTA's bread and butter was its lengthy assessment reports, which included shorter-form executive summaries and that reviewed the existing research and data on a topic (e.g., "Costs and Effectiveness of Cholesterol Screening in the Elderly"),⁵⁷ and explained what the evidence demonstrated—or did not.⁵⁸

The OTA was not free to research any topic it pleased. The law specified that the agency would initiate studies only at the request of a committee (either its chairman, ranking minority member or a simple majority), the OTA's board or its director.⁵⁹ It is also worth noting that the director was appointed by the 12-person board, whose members were

six senators (half Democrats and half Republicans) and six representatives (also equally divided).⁶⁰

The OTA's structure for producing assessments was aligned with the central Hayekian tenet that knowledge is dispersed. Thus, the OTA's production model aimed to network expertise. In order to do so, its staff relied heavily upon experts both inside and outside government to aggregate research and data, discuss it and then to generate its reports.

The OTA's run came to a close in 1995, when it fell victim to the politics of a new Republican majority in the 104th Congress. During this time, congressman Newt Gingrich (R-Ga.) rose from Minority Whip to become the first Republican Speaker of the House in four decades.⁶¹ Following his ascension, Gingrich set about to advance the "Contract with America,"⁶² a platform from the 1994 congressional campaign that sought to rein in big government and aggressively cut federal spending.

One of the eight pillars of the "Contract" included cutting spending by Congress itself, ostensibly in an effort to curb "waste, fraud or abuse."⁶³ However, they attempted to go much further than this, pushing to reduce congressional staffing levels by a third, as well as asking for significant cuts to legislative branch support agencies like the Government Accountability Office (GAO), Congressional Budget Office (CBO) and the Congressional Research Service (CRS).⁶⁴ During this "lobotomy"⁶⁵ of Congress, the OTA was singled out for elimination.

Although it was the smallest of the congressional support agencies, it had faced conservative criticism in past years and thus could be eliminated without disrupting day-to-day congressional operations.⁶⁶ The year before its termination, Rep. Bob Inglis (R-S.C.) introduced a bill in the 103rd Congress to terminate its funding.⁶⁷ In 1980, Reagan acolyte and populist

56. *Ibid.*

57. This particular report is available at <https://www.princeton.edu/-ota/disk1/1989/8911/8911.PDF>.

58. On the stark differences between the OTA's technology assessments and other legislative branch agency reports, see Richard Rowberg, "How Did the Reports of OTA, the Congressional Research Service, and the National Academies Differ?", *LegBranch.com*, Nov. 14, 2016. <http://www.legbranch.com/theblog/2016/11/14/how-did-the-reports-of-ota-the-congressional-research-service-and-the-national-academies-differ>.

59. 2 U.S.C. § 472

60. The OTA also was overseen by an advisory panel, which was appointed by Congress. Members included the heads of the GAO and the CRS and ten members of the public. Its job was to assess the agency's work and recommend improvements. See 2 U.S.C. § 476.

61. Jeffrey Gaylor, "The Contract with America: Implementing New Ideas in the U.S.," *The Heritage Foundation*, Oct. 12, 1995. http://s3.amazonaws.com/thf_media/1995/pdf/hl549.pdf.

62. "Republican Contract with America," U.S. Congress, 1994. <https://web.archive.org/web/19990427174200/http://www.house.gov/house/Contract/CONTRACT.html>.

63. *Ibid.*

64. Blair, pp. 66-68.

65. As Adam Keiper points out, "lobotomy" is a frequently used metaphor in discussing this event. See Adam Keiper, "Science and Congress," *The New Atlantis* (Fall 2004/Winter 2005), pp. 19-50. <http://www.thenewatlantis.com/publications/science-and-congress>.

66. With its day-to-day role in servicing requests from congressmen and their staff, CRS was too important to cut.

67. H.R.3777, "Office of Technology Assessment Termination Act," 103rd Congress

conservative pundit Donald Lambro⁶⁸ blasted the agency as being a liberal pet project that produced overly-technical studies that nobody read.⁶⁹ Following the election that year, which gave Republicans control of the Senate in 1981, newly-elected Sen. Mack Mattingly (R-Wash.) also tried to zero out the OTA's appropriations – although these efforts were quashed by fellow Republicans.⁷⁰

Further allegations of political bias came following a series of reports the OTA published that criticized the Reagan administration's Strategic Defense Initiative (SDI or "Star Wars"). An OTA background paper published in 1984, entitled "Directed Energy Missile Defense in Space,"⁷¹ sparked harsh criticism from the Heritage Foundation and conservative lawmakers⁷² like Sen. Orrin Hatch (R-Utah), who was otherwise a supporter of the agency.⁷³ The paper also gained an unusual amount of traction in the press.⁷⁴ At the time, Heritage's concerns dealt primarily with procedural reforms relating to sensitive national security information. However, the report and subsequent work on SDI were viewed by many conservatives at the time, as a "partisan hatchet job."⁷⁵ Indeed, despite the fact that the vast majority of its reports were uncontroversial, the OTA's work on SDI ultimately helped sink its political future. In this way, it was low-hanging fruit that gave Republican leaders credit for abolishing an entire federal agency.⁷⁶

However, while the optics of Congress tightening its own belt may have been symbolically important, the move yielded miniscule budget savings. Indeed, despite the fact that the OTA's budget represented only a tiny fraction of federal spending⁷⁷ and that its elimination was met with bipartisan resistance, Republican leadership ultimately saw it as politically necessary to demonstrate their commitment to reduce government spending.⁷⁸ Accordingly, on September 29, 1995,

the OTA closed its doors, and its 140 employees were let go after Congress voted to zero out its \$22 million per year in funding.⁷⁹ Subsequently, the GAO attempted to fill some of the gap left by the OTA's abolition by creating its own technology assessment unit, but it is a very small operation and produces only a handful of reports each year.⁸⁰

RECREATING THE OTA

Since its demise, there have been various efforts to revive the OTA. Most recently, Rep. Mark Takano (D-Calif.) offered amendments in 2016 and 2017 to restore its funding, the most recent of which failed by only 45 votes in the House.⁸¹ Rep. Bill Foster (D-Ill.), a physicist by training, is also a prominent advocate for reestablishing the office. Former Rep. Rush Holt (D-N.J.), another physicist, also persistently championed the cause.⁸² At various points, congressmen have also attempted to create other OTA-like entities within the legislative branch.⁸³ While none of these efforts have succeeded, they illustrate that there is still considerable interest in bringing back the OTA, even though it has now been gone nearly as long as it was in existence.

Perhaps unsurprisingly, votes on proposals to revive the OTA have divided roughly on partisan lines, with most Democrats voting in favor and most Republicans voting against. Nevertheless, there have been some notable conservative proponents for reviving the agency. For instance, in a 2015 letter to Speaker Paul Ryan (R-Wisc.) on the OTA, Democratic Members were joined by conservative Reps. Blake Farenthold (R-Texas) and Jason Chaffetz (R-Utah).⁸⁴ Additionally, a number of other influential Republicans⁸⁵ – including Rep. Michael McCaul (R-Texas), Chairman of the Committee on Homeland Security, and Rep. Lamar Smith (R-Texas),

68. Gary Clifford, "Reagan's Favorite Budget Hit Man, Author Donald Lambro, Says the Knife Must Cut Deeper," *People*, March 2, 1981. <http://people.com/archive/reagans-favorite-budget-hit-man-author-donald-lambro-says-the-knife-must-cut-deeper-vol-15-no-8>.

69. Donald Lambro, *Fat City: How Washington Wastes Your Taxes* (Regnery/Gateway, 1980), pp. 248-51.

70. Bimber, pp. 58-59.

71. Office of Technology Assessment, *Directed Energy Missile Defense in Space—A Background Paper*, U.S. Congress, April 1984. <https://www.princeton.edu/~ota/disk3/1984/8410/8410.PDF>.

72. Michael Warner, "Reassessing the Office of Technology," The Heritage Foundation, Nov. 7, 1984. <http://www.heritage.org/technology/report/reassessing-the-office-technology>.

73. Notably, the program the OTA criticized turned out not to be a viable means of missile defense given the limitations of 1980s technology.

74. Bimber, pp. 44-45.

75. Keiper, p. 48. <http://www.thenewatlantis.com/publications/science-and-congress>.

76. Blair, p. 67.

77. Bimber, p. 69.

78. *Ibid.*, p. 71.

79. Pub. L. 104-53, title I, §§113, 114, Nov. 19, 1995, 109 Stat. 526

80. See: https://www.gao.gov/technology_assessment/key_reports and https://www.gao.gov/search?rows=10&now_sort=score+desc&page_name=main&q=technology+assessment.

81. See H.Amdt.219 to H.R.3219, 115th Congress; H.Amdt.1171 to H.R.5325, 114th Congress.

82. See H.R.2148, 107th Congress; H.R.125, 108th Congress; H.Amdt.711 to H.R.2551, 112th Congress; and H.Amdt.649 to H.R.4487, 113th Congress. Holt also attempted to introduce an amendment to the Legislative Branch Appropriations Act in 2002 and 2003, but the Rules Committee ruled it out of order on both attempts.

83. For instance, Sen. John Kerry attempted to create an entity called the "Science and Technology Assessment Service" in the "Global Climate Change Act of 2001" (see S.1716, 107th Congress). Rep. Holt also tried to create an alternative to the OTA, called the "Center for Scientific and Technical Assessment" (see H.R.4670, 108th Congress). Meanwhile, in the Fiscal Year 2002 appropriations bill, an experimental technology assessment division was set up within the GAO that continues to this day - albeit with a limited budget (see Blair, pp. 72-76).

84. Rep. Mark Takano, et al., "Letter to Speaker Paul Ryan," Dec. 11, 2015. [https://foster.house.gov/sites/foster.house.gov/files/2015-12-11 Ltr to Speaker Ryan on OTA.pdf](https://foster.house.gov/sites/foster.house.gov/files/2015-12-11%20Ltr%20to%20Speaker%20Ryan%20on%20OTA.pdf).

85. Including Reps. Justin Amash (R-Mich.), Carlos Curbelo (R-Fla.), Kay Granger (R-Texas), Ileana Ros-Lehtinen (R-Fla.), Randy Hultgren (R-Ill.), Leonard Lance (R-N.J.), Barry Loudermilk (R-Ga.), Kenny Marchant (R-Texas) and Steve Russell (R-Okla.). See Pub. L. 104-53, title I, §§113, 114, Nov. 19, 1995, 109 Stat. 526.

Chairman of the Science, Space, and Technology Committee – have recently supported its revival.⁸⁶

Notwithstanding such support from within their own party, most congressional Republicans have displayed no enthusiasm for this enterprise. Adam Keiper observes that this has been for three main reasons: “cost, pride, and concerns about bias.”⁸⁷ Additional objections to the agency’s revival might also include charges that it is duplicative of functions performed by other government entities, that it would lead to more government intervention or that it would not be effective in informing policymaking.

Such arguments, however, are hardly persuasive. Accordingly, the sections that follow seek to allay these common objections in order to argue that the OTA should be revived to assist lawmakers in the difficult task of effectively legislating new and developing technologies.

“Reviving the OTA is too expensive.” Conservative activists are quick to point out that with our skyrocketing national debt, we need to save every penny we can.⁸⁸ Hence, they say, establishing a new agency or reviving an old one is a bad idea.

However, complaints about the cost of reviving the OTA fail to be compelling. First, the OTA’s budget, which was \$22 million in 1995,⁸⁹ represented a tiny fraction of the federal budget. It is even small compared to the relatively small overall legislative branch budget and the budgets of other legislative branch entities. For example, the current CRS budget is over \$106 million,⁹⁰ and the GAO budget is over \$555 million.⁹¹ Additionally, efforts to revive the OTA have proposed much more modest starting budgets, such as Rep. Takano’s proposal of \$2.5 million;⁹² a number that would represent 0.00006% of the \$4 trillion federal budget. Congress could save that much by cutting any number of truly wasteful programs. Indeed, conservative activists would do more good spending their energy on eliminating programs in Sen. Jeff Flake’s (R-Ariz.) “Wastebook.”⁹³

86. See vote results for H.Amdt.219 to H.R.3219, 115th Congress. <http://clerk.house.gov/evs/2017/roll418.xmlc>.

87. Keiper, p. 47. <http://www.thenewatlantis.com/publications/science-and-congress>.

88. See, e.g., <http://www.usdebtclock.org/>.

89. S. Rept. 104-114, 104th Congress. <https://www.congress.gov/congressional-report/104th-congress/senate-report/114>. This is about \$35 million in 2017 dollars. See, e.g., https://www.bls.gov/data/inflation_calculator.htm.

90. “Annual Report of the Librarian of Congress: For the Fiscal Year Ending September 30, 2016,” Library of Congress, 2017, p. 78. <https://www.loc.gov/portals/static/about/reports-and-budgets/documents/annual-reports/fy2016.pdf>.

91. See “GAO at a Glance,” U.S. Government Accountability Office, 2017. <https://www.gao.gov/about/gqlance.html>.

92. H.Amdt. 219, 115th Congress

93. Office of Senator Jeff Flake, “Wastebook,” U.S. Congress, January 2017. https://www.flake.senate.gov/public/_cache/files/4fcf3486-328a-40de-a1cc-f88515002d0d/wastebook-2016-final-pdf.pdf.

Like the GAO, which boasts a return of “\$112 for every dollar invested in GAO,” there are good reasons to think the OTA would be a good investment for taxpayers.⁹⁴ Like the GAO, the OTA could save money by advising against wasteful government spending, as well as economically harmful government interventions in the market. During its existence, it was fairly successful at this.⁹⁵ Given the multi-billion-dollar decisions involved with making technology policy and the costs of getting it wrong, cutting corners on technological expertise in Congress is a rationale that is penny-wise and pound-foolish.

Bringing back the OTA also does not have to entail new government spending, as it could be funded by moving money from elsewhere in either the federal budget or within the legislative branch’s budget.

“Reviving the OTA would be a political loss-of-face for Republicans.” It has been observed that elected officials are loath to admit they made a mistake or to give the appearance of flip-flopping. And for this reason, Republicans should fight the revival of the OTA.

However, such an argument ignores the fact that fewer than one-fifth of the members who served in 1995 remain in Congress.⁹⁶ Even among the Republicans who were in the 104th Congress, not all were opponents of the OTA. And many likely opposed the OTA only in deference to party leadership or for other political reasons that no longer apply.

Notwithstanding these facts, indubitably the more conservative Members of Congress might still have reservations and may fret that undoing a “victory” of the “Republican Revolution” could be exploited by conservative activists or even primary challengers coming from the right. This likely would not be much of a problem, however, as the OTA is an obscure and low-salience issue, and legislators could frame its revival in many ways that would resonate with conservative voters (for example, that the OTA will help Congress recognize boondoggles and not get hornswoggled by lobbyists, or that we need these geeky tech types to keep America safe from cyber threats).

“The OTA has a structural left-wing bias.” There are a number of points that give some Republicans the impres-

94. “Fiscal Year 2018 Budget Request,” U.S. Government Accountability Office, June 21, 2017, p. 1. <https://www.gao.gov/assets/690/685380.pdf>.

95. For example, the OTA’s recommendations helped modernize the Social Security Administration’s IT procurements, saving taxpayers \$368 million. Additionally, its criticism of the Synthetic Fuels Corporation contributed to billions in taxpayer savings. See, e.g., M. Granger Morgan and Jon M. Peha, *Science and Technology Advice for Congress* (Routledge, 2003), p. 69.

96. *Congressional careers: Service Tenure and Patterns of Member Service, 1789-2017*, Report 41545, Congressional Research Service, Jan. 2, 2017, pp. 8-9. https://www.everycrsreport.com/files/20170103_R41545_68dab2d3a44882883eeda9ec2bb36675fe1470ab.pdf.

sion that the OTA was a liberal entity pushing a Democratic agenda. Even in recent years, the most prominent advocates for reviving the agency have been congressional Democrats and left-leaning civil society groups. And, indeed, while it was in existence, the OTA had a number of associations with prominent liberals. For instance, the OTA's founder and first director was Rep. Emilio Daddario (D-Conn.). Other points, such as the aforementioned criticism of President Reagan's Star Wars program and the prominent role of the late Sen. Ted Kennedy (D-Mass.) in setting the OTA's earlier agenda, also fuel this perspective. But such a critique fails to account for the OTA's historical context and development.

By law, the majority party can exert some sway over the OTA, and both chambers of Congress were controlled by Democrats for the majority of its existence.⁹⁷ Per its founding statute, the twelve officers of its bipartisan board are selected by the speaker of the House and the president pro tempore of the Senate.⁹⁸ Even though the board must evenly represent both parties, this gives the majority party power to determine its composition. To better ensure political balance in the future, however, the OTA board selection process could be amended to permit the House and Senate minority leaders to select the members of their party who serve. This would eliminate any suspicion that the Majority Leader and Speaker might select the mavericks from the minority party. At any rate, while a perennially Democrat-controlled Congress may have once contributed to the perception of liberal bias, this circumstance no longer holds, as Republicans have held majorities in the House of Representatives and Senate more often than not since the OTA's demise in 1995.

Moreover, while the OTA's inception was in a left-leaning Congress and it received some justifiable criticism as a result, starting in 1979, it pivoted to a strategy of neutrality when physicist John Gibbons became its director. Gibbons immediately set out to reform the agency, firing 15 percent of its staff, refocusing on serving legislators and putting an end to nepotistic pet projects.⁹⁹ As Bruce Bimber observes, this reform was necessary not just as a matter of professional standards, but as a "political survival strategy."¹⁰⁰ Subsequently, throughout the 1980s and 1990s, the OTA established a strong reputation for objectivity and political neutrality, and gained a number of influential conservative supporters including Sens. Orrin Hatch (R-Utah), Sen. Chuck Grassley (R-Iowa), Sen. Pat Roberts (R-Kan.) and Sen. Ted Stevens (R-Alaska).¹⁰¹ Tellingly, in one of the attempts

97. With the exception of the 97th, 98th and 99th congresses, throughout all of which Republicans maintained a majority in the Senate, and the 104th Congress, in which Republicans took both chambers.

98. 2 U.S.C. § 473

99. Bimber, p. 57.

100. *Ibid.*, pp. 50-51.

101. *Ibid.*, p. 51.

to stop the elimination of the OTA, 48 House Republicans bucked leadership and joined with Democrats.¹⁰²

"The OTA would encourage more government intervention." Perhaps a more serious charge is that the OTA structurally favors federal intervention over market solutions or delegation to state and local governments.¹⁰³ Thus reviving it would encourage Congress to enact more technology-related legislation, leading to policy outcomes that conservatives and libertarians would disfavor.

In some ways, this is a reasonable concern. After all, it is the job of the OTA to advise Congress, in part on potential legislative actions in science and technology policy. While they may strive to be objective, it is inevitable that their conclusions will be influenced by their philosophical approach to risk, or in favoring market solutions over technocratic alternatives. Indeed, there is a reasonable case to be made that federal agencies have a tendency to devolve into left-leaning bureaucracies. However, as Keiper argues, we should not simply give up and assume that the OTA would automatically become an "ideological nightmare."¹⁰⁴

This brings to mind similar concerns regarding Ryan Calo's proposal for a Federal Robotics Commission (FRC).¹⁰⁵ Under this proposal, Calo argues that we need a new advisory agency to assess the "novel experiences and harm" enabled by advances in artificial intelligence and robotics.¹⁰⁶ This sounds a bit like the OTA, and Calo even notes that the agency could have performed this function (at least in part) if it were still in existence.¹⁰⁷

The FRC proposal received similarly harsh criticism from the right, with concerns that it was duplicative of other bodies, that sector-specific agencies were dangerous and prone to capture and that it might devolve into a byzantine regulatory body, which would slow the progress of innovation.¹⁰⁸ But there are a number of reasons why criticisms of the FRC should not be applied to the OTA. For starters, the OTA would be a legislative branch agency and thus while the

102. This amendment entailed a plan to move the OTA's functions to the CRS. A subsequent amendment failed to pass as a result of increased pressure from Republican leadership. See Bimber, pp. 74-75.

103. "Policy Analysis at OTA: A Staff Assessment," Office of Technology Assessment, May 1993, pp. 6-7. <https://digital.library.unt.edu/ark:/67531/metadc9860>.

104. Keiper, p. 50. <http://www.thenewatlantis.com/publications/science-and-congress>.

105. Calo, pp. 11-12. <https://www.brookings.edu/research/the-case-for-a-federal-robotics-commission>.

106. *Ibid.*

107. *Ibid.*

108. Adam Thierer, "Problems with Precautionary Principle-Minded Tech Regulation," *Tech Liberation Front*, Sept. 22, 2014. <https://techliberation.com/2014/09/22/problems-with-precautionary-principle-minded-tech-regulation-a-federal-robotics-commission>.

legislative branch performs some regulatory functions (such as through the U.S. Copyright Office), this is the exception rather than the rule. In fact, given its statutory authority, mission and structure within Congress, it would be incredibly unlikely for the OTA to evolve into an entity like the Federal Communications Commission. Additionally, the subject matter jurisdiction of the OTA is incredibly broad—including energy, industrial policy, information technology, space, education and environment—much broader than that of the proposed FRC. The types of people employed by the OTA, furthermore, are predominantly academic experts rather than lobbyists or political operatives. This would suggest a limited risk of regulatory capture by particular industries. Similar to the CRS or GAO, both of these concerns are unlikely to apply to the OTA.

If it is functioning properly, the OTA will promote more congressional engagement in technology policy. While there is a risk that this could increase interventionist outcomes, it could also greatly decrease the likelihood of catastrophic outcomes by injecting objective analysis to chill technopanics, reactionary thinking and clumsy blundering. It could also assess and advise against harmful government programs and interventions in the market, as it has done in the past.¹⁰⁹

While the OTA may sometimes help Congress reach conclusions free market scholars may not endorse, this is endemic to our democratic legislative process, as those decisions reflect the preferences and platforms of our elected representatives. Furthermore, the advice given by the OTA is likely to be more objective and higher quality than from alternative sources. Thus, improving the institutions that provide expertise to lawmakers is not inherently at odds with “permissionless innovation.”

“We do not need another expert bureaucracy.” Congress already has the CBO, CRS, GAO, and access to the National Academies of Sciences, Engineering and Medicine (NAS), and numerous expert agencies in the executive branch. For this reason, critics argue that it does not need another agency of “nerds.”¹¹⁰

However, the total number of experts in the legislative branch has decreased in recent decades, even as the executive branch’s reach has expanded. The CRS, for example, has 22 percent fewer staff than it did in the late 1970s, and the

GAO’s headcount has dropped by 40 percent.¹¹¹ Thus Congress hardly has a surfeit of in-house scholars with nothing to do.

Second, the OTA’s lengthy examinations of technologies and the existent literature and data upon them were fundamentally different from the type of work the other legislative support agencies undertake. For example, the CBO does not work on science policy, as it is staffed by economists and budget wonks who publish budget-related reports and calculate “scores” of the costs of proposed legislation. The GAO, by nature, is first and foremost an auditor. Its analysts’ skills are geared more toward accountancy, legal analysis and field investigations. Thus, for example, it issues audits of agency spending and contracts, and reviews the effectiveness of government programs.¹¹² For its part, the CRS shoulders a variety of duties to support committees and individual members of Congress and their staffs. Its experts and information specialists draft digests of bills, produce primer reports on many different government programs and activities, it issues legal opinions, holds training seminars for newly elected members and newly arrived staff and it conducts reference research. CRS experts also testify before Congress and assist it with oversight activities.¹¹³ Thus its work is very different from that of the OTA and with only a small corps of individuals who work on technological and scientific issues, it is ill-suited to conduct technological assessments. Additionally, unlike the OTA, the CRS rarely involves outsiders in the composition of its reports, as it views itself as a private resource for Congress—one that needs to avoid the appearance of external influence or the compromise of its confidential relationship with the Hill.¹¹⁴

Finally, the National Academies may be most akin to the OTA, insofar as its staff heavily utilizes outside experts to produce assessment-type reports.¹¹⁵ Organizationally, however, the NAS is very different. Unlike the OTA, it is not located within the legislative branch—instead it is a private, not-for-profit corporation. Accordingly, little of its work is assigned by Congress. Whereas the OTA had an annual appropriation to spend on people and production, the NAS earns revenue

109. Morgan and Peha, p. 69.

110. The House Appropriations Committee report that defunded the OTA included language that declared: “The Committee has not provided funds for the Office of Technology Assessment. If any functions of OTA must be retained, they shall be assumed by other agencies such as Congressional Research Service or the General Accounting Office. Alternatively, the National Academy of Sciences, university research programs, and a variety of private sector institutions will be available to supplement the needs of Congress for objective, unbiased technology assessments.” H. Rept. 104-141, 104th Congress

111. “How to strengthen Congress.” <https://www.nationalaffairs.com/publications/detail/how-to-strengthen-congress>.

112. See, e.g., “Better Program Management and Oversight of Postsecondary Schools Needed to Protect Student Information, U.S. Government Accountability Office, Nov. 27, 2017. <https://www.gao.gov/products/GAO-18-121>.

113. *Annual Report FY2016*, Congressional Research Service, January 2017. <https://archive.org/details/CongressionalResearchServiceAnnualReportFy2016>.

114. Numerous sources within the CRS also privately report that the agency is presently suffering rapid staff turnover in key roles and internal clashes between staff and top management.

115. Rowberg. <http://www.legbranch.com/theblog/2016/11/14/how-did-the-reports-of-ota-the-congressional-research-service-and-the-national-academies-differ>.

through contracts with government agencies.¹¹⁶ Although the NAS might be able to conduct the same work as the OTA did, it would require reworking its statutory charter, along with other operational restructuring.¹¹⁷ It is also unclear whether it would want to be obliged to conduct studies at the behest of a board of legislators, as the NAS has historically prized the distance that separates it from politics. Suffice it to say, enacting legislation to do all of this would be challenging in the present highly polarized Congress. However, asking legislators to rely heavily on executive agencies for information runs entirely counter to Congress' duty to oversee and maintain independence from the executive branch.

CONCLUSION

When the OTA was shuttered, the technology landscape was dramatically different than it is today. At that time, the Internet was still emerging from within the walls of government and academia.¹¹⁸ Only a tiny percentage of the public owned cellular phones, and they lacked functions like GPS, internet connectivity and social media. Now, the Internet is ubiquitous and smartphones are becoming common in the developing world.¹¹⁹ Indeed, technological complexity has grown fantastically over the past two decades and there is no reason to believe the pace of innovation will slow. But as technology advances, it also creates challenges for our elected officials to comprehend its impacts and to enact sensible policies around it, which includes updating and clearing out old laws and regulations.

Maintaining the status quo all but guarantees that suboptimal or outright bad policies will be made more frequently. Failing to augment Congress' technological expertise also ensures the preferences of executive branch agencies and private interests hold the greatest sway in technology policy decisions, to the detriment of the public interest. To address this, Congress needs to bring back its nerds.

Rather than to reinvent the wheel, Congress can most easily bolster its technology policy knowledge by reviving the OTA. The agency's costs are nominal—a veritable rounding error in the legislative branch's \$4.4 billion budget—to say nothing of

the federal government's \$3.9 trillion in annual spending.¹²⁰ Further, the OTA's statute remains on the books so Congress could revive the agency merely by including funding in the next legislative appropriations. To address concerns about the agency's research agenda, Congress could include directive text to appoint the agency's initial board and leadership.

Although it will take political courage, reviving the OTA would be easy. Doing nothing, on the other hand, only ensures that Congress' technological aptitude will erode even further.

ABOUT THE AUTHORS

Zach Graves is director of technology and innovation policy for the R Street Institute, where he manages development efforts for the tech program, oversees its scholars and coordinates its work on issues that include intellectual property, cybersecurity, internet governance, telecom, emerging technologies, privacy, the sharing economy, transparency and open data. Zach joined R Street in April 2013, having previously worked at the Cato Institute and the America's Future Foundation. He is also a fellow at the Internet Law and Policy Foundry and a visiting fellow at the National Security Institute at George Mason's Antonin Scalia Law School. He holds a master's from the California Institute of the Arts and a bachelor's from the University of California at Davis. Zach is married and lives in Washington.

Kevin Kosar is vice president of policy for the R Street Institute, where he oversees all of the institute's research across its commercial freedom, criminal justice, energy and environment, financial markets, governance, income mobility, innovation policy, insurance and public health policy programs. He co-directs the non-partisan Legislative Branch Capacity Working Group, which aims to strengthen Congress. Kevin joined R Street in October 2014 from the Congressional Research Service, where he served as analyst and research manager. Earlier in his career, he was lecturer in policy and public administration at New York University and Metropolitan College of New York. Kevin is the author of three books: *Failing Grades: The Federal Politics of Education*, published in 2005; *Whiskey: A Global History*, published in 2010; and *Moonshine: A Global History*, published in 2017. He has been a Presidential Management Fellow and won the Academy of Wine Communications' wine writer award. Kevin received his doctorate in politics from New York University and his bachelor's from Ohio State University. He lives in Washington.

116. "Advising the Nation. Advancing the Discussion. Connecting New Frontiers," National Academies of Sciences, Engineering and Medicine, 2018. <http://www.nationalacademies.org/brochure/index.html>; and "FAQs," National Academies of Sciences, Engineering and Medicine, 2018. <http://www.nationalacademies.org/newsroom/faq/index.html>.

117. NAS' charter provides no role for the Congress – or the president, for that matter – in selecting its leadership. See 36 U.S.C. §§ 150301-150304.

118. "1994 -2008 - 14 Years of Web Statistics," University of Virginia, July 16, 2009. <http://www.virginia.edu/virginia/archive/webstats.html>.

119. Jacob Poushter, "Smartphone Ownership and Internet Usage Continues to Climb in Emerging Economies," Pew Research Center, Feb. 22, 2016. <http://www.pewglobal.org/2016/02/22/smartphone-ownership-and-internet-usage-continues-to-climb-in-emerging-economies>.

120. Legislative Branch: FY2017 Appropriations, Congressional Research Service, June 13, 2017. <https://www.everycrsreport.com/reports/R44515.html>; and "Policy Basics: Where Do Our Federal Tax Dollars Go?", Center on Budget and Policy Priorities, Oct. 4, 2017. <https://www.cbpp.org/research/federal-budget/policy-basics-where-do-our-federal-tax-dollars-go>.