McCourt School of Public Policy

beeckcenter social impact + innovation

THE ARCHITECTURE OF INNOVATION

Institutionalizing Innovation in Federal Policymaking

GEORGETOWN UNIVERSITY

About the Beeck Center for Social Impact + Innovation

The Beeck Center for Social Impact + Innovation at Georgetown University was launched in 2014 through the generosity of Alberto and Olga Maria Beeck. Part lab, part think tank, and part classroom, the Beeck Center works with students and practitioners to innovate new solutions to systemic social problems.

The Beeck Center engages global leaders to drive social change at scale. We conduct academic research, hold convenings and provide trainings, classes, and experiential labs for current and emerging leaders. Building on Georgetown University's core values and global reach, we drive creative thinking around issues at the intersection of data, technology, capital, and policy innovation. We invite a diverse community of thinkers to join us in looking beyond the obvious, to ask the unasked questions, and find adaptable solutions in today's changing world.

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The Georgetown University McCourt School of Public Policy is a top-ranked public policy school located in the center of the policy world in Washington, DC. McCourt's mission is to teach students to design, analyze, and implement smart policies and put them into practice in the public, private, and nonprofit sectors in the US and around the world.

Acknowledgements

The Beeck Center for Social Impact + Innovation and the Massive Data Institute (MDI) at the McCourt School of Public Policy at Georgetown University are pleased to present "The Architecture of Innovation," a new report in our ongoing Data for Social Good collaboration. Drawing on Georgetown's Jesuit mission of men and women in service for others, the Beeck Center and MDI's Data for Social Good research and convenings seek to better understand the impact of data, innovation, and evidence-based policymaking on social and public outcomes.

The Beeck Center and McCourt would like to thank the co-authors of this report, Dr. Hollie Russon Gilman and Jessica A. Gover, for their tireless dedication to the vision, research, and development of "The Architecture of Innovation."

We would like to especially thank the Case Foundation, the Democracy Fund, and Nielsen for supporting our ongoing Data for Social Good efforts.

We are ever grateful for the expertise and guidance of Sonal Shah, executive director of the Beeck Center for Social Impact + Innovation, and Ed Montgomery, dean of Georgetown University's McCourt School of Public Policy. Thank you to the staff and students at the Beeck Center and McCourt for their administrative and editorial support, particularly Jessica Bluestein, Cristal Clark, Priyanka Dinakar, Molly Kinder, Yvette Meftah, Lauren Mullins, Innocent Ndubuisi-Obi, Wilnie Petrash, Cristina Martinez Pinto, Austin Seaborn, Hanna Schurman, Robert Treval, and Marta Urquilla. Also, thank you to Marcia Kramer for her editorial support, and to Kerry Lutz for supporting the visual design of this publication.

We would like to extend our gratitude to the experts from across government, philanthropy, academia, and the social sector that participated in our May 9, 2016 Data for Social Good Convening, "Institutionalizing Innovation in Federal Policymaking," and/or for making themselves available for interviews and comment during the development of this report: Philip Auerswald, Gadi Ben-Yehuda, Lucy Bernholz, Courtney Bowman, Robin Carnahan, Ann Mei Chang, Pablo Chavez, Dan Chenok, Phaedra Chrousos, Alan Davidson, Anjelika Deogirikar, Frank DiGiamarino, Gary Edson, Claire Ehmann, Andy Feldman, Jascha Franklin-Hodge, Kate Gage, Tom Glaisyer, Jonathan Greenblatt, Alaina Harkness, Justin Herman, Sheila Herrling, Nate Higgins, Hudson Hollister, Ginny Hunt, Seema Iyer, Nigel Jacob, Tom Kalil, Ian Kalin, Lorelei Kelly, Chris Kingsley, Karen Kornbluh, Seamus Kraft, Christopher Laubenthal, Blair Levin, Peter Levin, David Lewis, Maggie Little, Lauren Lockwood, Rob Mahini, Joshua Marcuse, Andrew McMahon, Adam Neufeld, Andrew O'Connell, Derek Ozkal, Jen Pahlka, Quentin Palfrey, Eloise Pasachoff, DJ Patil, Udaya Patnaik, Marcus Peacock, Andrew Reamer, John Righter, British Robinson, Andrew Schoenbach, Robert Shea, Lisa Singh, Shamina Singh, Jessica Singleton, Steve Sinha, Kathy Stack, JoAnn Stonier, Dan Tangherlini, Will Tucker, Haley Van Dyck, Kamala Vasagam, Archana Vemulapalli, Anthea Watson Strong, David Wilkinson, and Drew Zachary.

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EXECUTIVE SUMMARY

"Innovation" has become a buzzword in government, industry, and society. Yet, scaling innovation for public policy is rarely discussed.

"The Architecture of Innovation" provides recommendations for how government can embed innovation into federal policymaking to achieve scalable solutions and better serve the American public. Produced by Georgetown University's Beeck Center for Social Impact + Innovation and the Massive Data Institute at the McCourt School of Public Policy, this report offers a framework for how to structure innovation in policymaking.

The 2016 presidential transition teams have the opportunity to build upon the innovation agenda of previous administrations and to advance a *culture of innovation* throughout government to solve problems. This report is not a checklist for how to "innovate" in government; rather, it offers a structure to drive a change in culture.

As part of our ongoing "Data for Social Good" efforts, the Beeck Center and McCourt held a convening in spring 2016 to discuss institutionalizing innovation in the federal government. Upon completing more than fifty follow-on interviews with executives across sectors (government, nonprofit, academia, industry, and civil society), a consistent message emerged. To build a better public sector for the twenty-first century, government must embrace innovation and build the necessary architecture to promote and institutionalize its use as a means to achieve outcomes.

This report defines "innovation" as a means for *creating a more effective government and improving services*. A core assumption is that innovation requires a governance structure that can influence a change in culture. This report focuses on a few broad areas where government can design structural supports to

enable a culture change: the potential of technology, the importance of data and partnerships to provide more effective and efficient services for society, and the creation of structural supports that enable adaptability to change.

The federal government does not need to do it alone. There is much to be learned from cities across the country that are incubating and scaling programs and redesigning public systems to be more effective. US cities are leveraging technology to engage with citizens and demonstrating the potential of civic innovations such as participatory budgeting to improve government. This report highlights best practices in cities and recommends approaches that the federal government can use to work with cities to learn from their efforts and to create more incentives for scalable policy solutions.

"The Architecture of Innovation" provides a general overview of innovation efforts at the White House, and then offers recommendations with subsequent analyses in four key areas to help organize innovation in the next administration: (1) White House and Agencies; (2) Policy Innovation Offices and Public-Private Partnerships; (3) Cities as Incubators of Innovation; (4) Recruitment, Hiring, and Training. The report concludes with a summary of recommendations organized into three categories—structure, policy, and people. This report represents a synthesis of conversations with a broad, diverse group of bipartisan stakeholders and does not endorse a particular political point of view or ideology.

METHODOLOGY

To develop this report, Georgetown's Beeck Center for Social Impact + Innovation and the Massive Data Institute at the McCourt School of Public Policy undertook a rigorous, cross-sector, and interdisciplinary research approach. Staff conducted more than fifty interviews with experts from government (federal, state, and local), academia, the private sector, civic organizations, foundations, and technology companies.

The research scope included interviews, primary source material, documentary evidence, official reports, and media research. We explored how data, technology, and other innovative approaches should be part of the conversation; how the White House can work with agencies to initiate pilot programs and scale what works; and how these data points should be utilized to better inform policy.

Our research began around the concept of leveraging data for social good. In November 2015, the Beeck Center and Georgetown's Massive Data Institute at the McCourt School of Public Policy co-hosted "Data for Social Good: Reaching Underserved Communities,"[1] a cross-sector convening of thought leaders in big data, community-based organizations, and civic technology to discuss the opportunities and challenges for leveraging data and technology in public policy and social innovation, particularly to help underserved communities. There was a clear demand from those at the event and in commentary online for deeper discussion and objective research into how data can bring about positive changes in social policy.

To build on this conversation, on May 9, 2016, the Beeck Center and McCourt School convened roughly fifty thought leaders from government, academia, the private sector, civic organizations, foundations, and technology companies to discuss the structure of governance needed to institutionalize the use of data and create a culture of innovation throughout the federal government. The meeting discussed the current organizational structure, positions, and responsibilities within the White House and federal agencies, and some possible decision making structures to prioritize an innovation agenda, which

are included in the body of this report. This convening also focused on the types of skills and recruitment practices needed to attract talent from civil society and the private sector, and how to better manage talent across the government, especially the civil service. During the meeting moderators asked where this has been done well, and what the critical policy components are for data experts and technologists. This report builds upon that conversation.

Our research clearly showed that innovation is *not* the provenance of a single political party, nor is it just about people with hard data skills, or those who exclusively champion open data, or about a government that is more transparent, bigger, or smaller. Rather it is about finding *new ways* to think creatively and engage the best talent and resources from across sectors *and* from across party lines. Embedding an innovation mindset within the federal government requires an integrated, long-term approach to create solutions at scale. Establishing this cultural shift requires an active and robust engagement with the politics of the federal government, particularly with Congress. The solutions to this problem also need expertise from across the political spectrum, including a proactive engagement with the demands of oversight.

Building a twenty-first-century government requires a governance structure that enables an internal ecosystem of innovation that invests in technology, better use of data, and partnerships that can deliver results. This report is a first step in this effort. The recommendations described herein are offered as possible approaches for the next administration, and while this report does not provide concise metrics, it assumes that enabling the expansion, integration, and enhancement of management strategies for data, technology, and new partnership models will collectively contribute to institutionalizing a culture of innovation.

The following sections provide background analysis to define innovation, an assessment of innovation efforts at the White House and agencies, propose next steps for the next administration, and then describe recommendations and further analysis across four key areas offering inroads to institutionalize a *culture of innovation* in federal policymaking:

1. The White House and Agencies
2. Policy Innovation and Public-Private Partnerships
3. Cities as Incubators of Innovation
4. Recruitment, Hiring, and Training

The report concludes with a summary of recommendations.

BACKGROUND

Innovation 101

Innovation can mean all things to all people, but it is often defined at the intersection of data, technology, and new approaches.

As Professor Mark Zachary Taylor notes "*innovation* has something to do with *scientific progress and technological change*."[2] Innovation tends to invoke the image of change through the invention or discovery of new products, tools, and supplies; this is sometimes referred to as the "what" of innovation—such as drug development, the reinvigoration of American industry, the creation of the American interstate highway system, and DARPA (the Defense Advanced Research Projects Agency). Put a different way: Benjamin Franklin, inventor extraordinaire, is the "what" of innovation among the American Founders.[3]

In his announcement at South by Southwest 2016,[4] President Obama used a similar definition, "One of the things that makes America so strong is our spirit of innovation. Our drive to invent and harness new technologies to tackle our greatest challenges."[5] This type of innovation can also be understood as fostering economic growth, productivity, and new jobs through the creation of new products and services. Great inventions, industry transformation, and pioneering accomplishments in product development are part of America's national identity.

This report, "The Architecture of Innovation," approaches innovation from a different but similarly foundational angle: innovation as breaking the status quo, looking at old problems with a new mindset and approach, or, put another way, this report focuses on the "how" of innovation. From this angle, innovation is understood as a means to provide better services to citizens and to create a more effective and responsive government, as a transformative practice, procedure, or *process* that is critical to build trust and to sustain

and scale change. The report's definition of innovation invokes more of Alexander Hamilton than Benjamin Franklin.[6] Hamilton built transformative processes, institutions, and practices that to this day continue to shape our society.[7] Our definition includes both service delivery and business model innovation.

Innovation in process is more than streamlining or modernizing; it is about expanding the scope of government service delivery and creating a more inclusive policy process. The report uses "innovation" as a means for creating a more effective and inclusive government. A core assumption is that innovation requires a governance structure that can influence a change in culture. As Beth Simone Noveck and Stefaan Verhulst note, "institutionalizing a culture of technology-enabled innovation will require embedding and institutionalizing innovation and technology skills more widely across the federal enterprise."[8] Changing culture means taking a more intentional and systemic approach that focuses on testing and scaling ideas, investing in people, and achieving measurable outcomes. A culture of innovation means continuously exploring and adopting new processes in an ecosystem where risk is incentivized, not precluded by structural responsibilities.

While creating a culture of innovation is the goal of this report, mandating a policy change is not the answer; a change in culture requires an enabling environment. An ecosystem of innovation is an enabling environment informed by day-to-day interactions and habits, formal and informal relationships, and norms and laws. This type of cultural change has taken root across the private and social sectors, and the next administration has the opportunity to provide structure to enable, organize, and institutionalize a federal innovation ecosystem. This means transforming government service delivery mechanisms, operations, and the core nuts and bolts of government. In other words, the next administration can structurally enable an *innovation in process to achieve better outcomes for the American people.*

Governance Innovation

This report approaches innovation as a matter of governance, not just as an opaque process. Innovation in many ways is a concept from the private sector and has an intense competition connotation, but today it is being repurposed for the public sector.[9] Since the reinventing government movement in the early 1990s, there has been a recognition that the public sector *can innovate*.[10] This includes the National Partnership for Reinventing Government, the interagency task force that was established to reform and streamline the federal government.[11]

Experience from previous administrations provides lessons and guidance on how best to institutionalize and manage change. Some key features of these programs are budget and working within budget structures; leadership from the top, prioritizing programs for the secretary and/or senior officials; a balance of civil service and political service; a strategy that is focused both externally and internally; and flexibility to modify a program or policy to address rigidity toward outcomes.

Innovation has taken on many forms in the federal government. One aspect is making better citizen-facing government services (e.g., the Technology Transformation Service of the General Services Administration, which now houses 18F, or the US Digital Service in the Office of Management and Budget and agency-level digital teams). Another aspect is integrating technology and the insights of data science into the policy process (e.g., the White House's Digital Cabinet, Data Cabinet, the Technology Policy Task Force, or the Social and Behavioral Sciences Team); coordinating how technology impacts several policy councils (e.g., NEC, NSC, DPC); and setting new policy areas (e.g., integrating drones into the national airspace, creating the right policy framework for self-driving cars, enabling equity-based crowdfunding, and policy around data portability[12]). Other innovation efforts focus on expanding the use of open data (e.g., Open Data Executive Order,[13] Data.gov, Cloud.gov, and the work of the Open Government Partnership[14]); or the application of our nation's top science and technology resources on key policy priorities such as

cancer, precision medicine, 5G wireless technologies,[15] the human brain, American manufacturing, or space travel. For others, innovation is about rethinking federal information technology infrastructure (e.g., how to better spend more than $80 billion on IT).[16] There are many ways to innovate in government. The purpose of this paper is to convey the need for structural supports to coordinate the convergence of many of these efforts and to enable sustained iteration and adaptability.

How to *Drive* Innovation

The shift to an 'outcomes mindset' demands systemic solutions. For government to drive innovation, this report proposes a crosscutting, dynamic approach that can be achieved through changes in *structure*, *policy,* and *people* (e.g., recruitment and training practices).

Before describing the linkages between key facets of this argument, it is important to emphasize the significance of policy. The implementation of a single policy can solve myriad issues when developed thoughtfully. For example, the Clean Air Act of 1970 did not just solve for asthma in Los Angeles County; broadening the scope of application, this policy ushered in a new era in environmental and public health management practices. The National Park Service, established in 1916, started a global movement that linked the preservation and protection of a landscape's natural state to the very identity and core values of this nation. (For additional examples and details, see Appendix A: *Great Moments of Innovation in Policymaking*.)

The 'culture of innovation' proposed by this paper requires more than just implementing a new policy or designing a new program. Instead, it requires a dynamic, crosscutting approach to governance. By engaging with and addressing various issues across three principal areas (structure, policy, and people), government service delivery can be transformed (Figure 1).

Figure 1. Transforming Government Service Delivery

	Structure	Policy	People
Governance	Align Budgets/ Risk/ Innovation	Procurement/ Data/ Regulation/ Programs	Who Is Managing?
Incentives/ Capital	Making capital available for new ideas/ design for solutions/ learning and innovation	Funds/ grants/ challenges/ prizes/ scale	Attracting Talent
Information/ Tech/ Data/ IT	What's Out There? Public-Private Data Sets/ Citizens vs. State/ Smarter Decision Making (Feedback Labs; Participatory Budgeting)	Open Gov/ Cybersecurity/ Transparency	Education/ Training/ Capacity
Entrepreneurial Mindset	Allowing New Players Entrance to Prove Ideas (Where Are Ideas Sourced?)	Open to Ideas/ Outcomes-Focused	Iterative Learning/ Design Thinking/ Behavioral Approaches

As society moves toward a more digital economy, data and technology are critical to creating a twenty-first-century government. New tools and approaches alone are not sufficient to achieve systemic change unless linked to the outcomes that government is trying to achieve. Innovation should not be a checklist. It needs to be about a way of operating, an approach to governance where new tools and methodologies are enabled by an institutionalized *learning environment*. Government needs to be able to pilot, iterate, scale, and adapt to new approaches and tools, through a broad spectrum of new techniques.

This report focuses on a few broad areas: the potential of technology; the use of data and partnerships to effectively deliver solutions and better engage with the public; and creating structural supports that enable adaptability to change. Harnessing innovation in government requires fostering an environment where personnel can *pilot, iterate, and scale* innovative practices (e.g., testing outcomes-based finance models such as innovation funds, pay for success, prizes, and challenges)[17] and creating incentives and training opportunities for staff (e.g., supporting current civil servants with a great idea, training, and flexible hiring). Under this broad net, all of these features are integral to a culture of innovation.

Innovation labs, centers, and leadership roles are developing across the government, from the Office of Personnel Management to the Department of Commerce, but these efforts need to operate as a cohort. From social innovation funds to Agile procurement, the next administration has the opportunity to take these tools of innovation (i.e., technology, people, ideas) that currently operate in a variety of offices, programs, and initiatives, and create a management structure that can integrate and embed innovation across agencies. (See Appendix B: *Government Innovation Program Examples*.) This requires an appetite for risk, accompanied by structural features that enable 'the trial and error' inherent to innovation—after all, risk can be the polar opposite of bureaucracy. To transform government and achieve systemic change, the president and the cabinet will need champions to drive and stimulate this *cultural* change.

Such transformation and change will also require bold leadership from Congress to provide the requisite political and financial capital for sustained results.

Technology, data, and partnerships should be more than just tools for implementation—they should be a part of the design. For public priorities, such as clean energy technologies or healthcare programs, government can use its capital in innovative public-private partnerships that: crowd in other capital (e.g., creating matching fund requirements), catalyze funders to drive more capital in innovative public private partnerships, hold convenings to create collaborations, or use prizes and challenges to source solutions.

This report is not an exhaustive account of all innovation in government. It recognizes that people will disagree with the limits, contours, and definitions of this approach. The proposed framework detailed in this report aims to provide a stylized account with key themes, illustrative examples, and a structure for how to organize in order to deliver results.

RECOMMENDATIONS FOR THE NEXT ADMINISTRATION

Innovation at the White House

Understanding the chronology of innovation in the federal government is a useful first step to help contextualize and assess current practices.

This section provides an introductory overview of innovation across administrations. The Obama administration's White House innovation efforts are considered in greater detail in the following section, "White House—Analysis." Administrations across the political spectrum have taken some important steps to modernize government to meet the needs of citizens.

The administrations of President Bill Clinton and President George W. Bush sought to establish innovative solutions to some of the oldest and newest problems of our time. For example, the Clinton-Gore administration launched the National Partnership for Reinventing Government and the US government's first web portal, FirstGov.gov. The National Partnership for Reinventing Government worked to pivot the nuts and bolts of the federal government to match the technological advancements and economic expectations of that time. The Bush administration[17] passed the E-Government Act of 2002, which made the Office of E-Government and Information Technology a permanent office within the White House Office of Management and Budget (OMB). President Bush also deployed the President's Management Agenda (2002), created the Millennium Challenge Corporation (2004),[19] and, in 2007, implemented the America COMPETES Act, which proposed, among other things, to double funding for innovation-enabling research at federal agencies and to increase funding for the National Science Foundation. Also, the Bush administration introduced expanded evidence-based decision making structures in government that paved the way for critical evidence-based policy developments, such as the Evidence-Based Policymaking Commission, which was launched in 2016. (See Appendix C: *White House Innovation Chronology—Programs & Offices*.)

Building upon the work and lessons of previous administrations, the Obama administration accelerated the expansion of innovation across government. In 2009, the administration created the federal chief information officer (US CIO) position out of the administrator for e-government and information technology, a feature of the Bush administration's E-Government Act of 2002, to oversee the OMB Office of Electronic Government. Drawing on ideas introduced during the campaign and early transition strategy, the Obama administration created multiple offices and programs—the Obama transition team established the Technology, Innovation, Government Reform Group (TIGR Group, pronounced *Tig-hur*) which recommended the creation of what became two key fixtures in the Obama administration: the chief technology officer (CTO) in the Office of Science and Technology Policy (OSTP), and the Office of Social Innovation and Civic Participation (SICP) within the Domestic Policy Council.

Both the CTO position and SICP have led to policy changes, including the establishment of innovation funds (e.g., Social Innovation Fund), new data-driven programs and initiatives, pay-for-success–funded programs, new fellowships and employment opportunities, and the expansion of open data resources. The technology initiatives also led to the creation of a number of other offices and positions, for example, the US Digital Service (USDS, established in 2014) in OMB and agency digital service teams; the position of chief data scientist and the chief digital officer (2015); the Social and Behavioral Sciences Team (SBST, 2015); the General Services Administration's Technology Transformation Service (2016); and multiple other programs at OSTP.[24] (See Appendix D: *White House Innovation Chronology—Key Roles & Positions.*) The Obama administration has also utilized various hiring initiatives to bring on personnel with new talents and expertise, for example, the Presidential Innovation Fellows program, American Association for the Advancement of Science fellowships, and the Franklin Fellows program.

From enabling unprecedented transparency, to active progress in open government and open machine readable data, innovation funds that scale what works, new types of public-private partnerships, and precision medicine, the Obama administration has made great strides to expand and prioritize innovation-

The Evidence-Based Policymaking Commission

The Evidence-Based Policymaking Commission developed from the collaboration of Senator Patty Murray (D-WA) and Speaker Paul Ryan (R-WI)[20] in their Evidence-Based Policymaking Act of 2016,[21] which was signed into law on March 30, 2016.[22] The law provides for the creation of the commission, which is composed of fifteen individuals selected by the president and congressional leaders. Members are known for their expertise in data fields or economics, and include Katharine Abraham, director of the Maryland Center for Economics and Policy at the University of Maryland, and Robert Groves, the provost of Georgetown University.[23] The stated goal of the commission is to gauge the potential for using data in policymaking while guarding users' privacy. In pursuing this goal, the commission seeks to determine what type of data is useful, how these data could be used, who will be granted access, and how data will be protected.[24] According to the terms of the 2016 act, the commission's assessment of evidence-based policy in government will conclude after eighteen months.

driven policy. These programs and offices have been nodes in triggering conversations about the culture of innovation throughout the White House and, in some cases, at agencies. These initiatives have produced some insightful developments: innovation funds within agencies; the creation of the White House Data and Digital Cabinets; evidence-based policy conversations; the use of prizes and challenges; small, critical changes in technology procurement processes; and the attraction and recruitment of new talent to government. Now, the opportunity is to move beyond these individual successes and create structures that prioritize new methods and approaches within the White House, enable communication and collaboration across agencies, and, most importantly, enable the federal government to better serve the American people.

By piloting new positions, projects, and offices, the Obama administration has introduced the possibilities and opportunities afforded by integrating innovative tools, ranging from the use of data, to new technologies, to alternative hiring practices into the operation of the White House and across agencies. There is much to be learned from these experiences. There is a need to integrate, organize, and enable communication across these efforts to clarify who does what and to share lessons to avoid waste, enhance efficiencies, and bring innovative solutions to scale across government. Also, these developments (e.g., innovation labs, innovators in residence, digital service offices) are not designed to deliver solutions *at scale* as permanent features of the federal government—the next administration has the opportunity to institutionalize new structures, policies, and personnel to embed a culture of innovation to help achieve scale across government.

Innovation in the Next Administration

In researching this report, many interviewees mentioned that while the Obama administration has made great strides to test new methods for improving services and recruiting new personnel with dynamic competencies (e.g. experts in design thinking or user-centered design, data specialists, dual-competency innovators, ethnographers, or community organizers) much remains to be done *structurally* to establish the benefits of these new methods and hires. By creating institutionalized structures, the next administration can ensure that lessons learned from pilot innovations and innovators will be embedded into *how* government operates. Without a systematic approach to how innovation is structured within government, these interventions run the risk of being *time-bound*. Furthermore, programs centered on bringing external technology talent into the federal government run the dual risk of being *personality driven* and overlooking the potential and necessity of building capability within the existing federal workforce (e.g., from civil to foreign service) to meet the demands of a twenty-first-century government.

Every day in government, personnel are working to solve problems and generate "public value," but, as Harvard Professor Mark Moore describes, this narrative is often divorced from the shared experience of everyday Americans.[26] Rewriting the narrative of what it is like to work in government to better capture the distinct impact and opportunity of government work is critical, especially given the realities of today's federal workforce: the federal workforce has record low morale,[27] it is rapidly aging, recruiting and retaining fewer young personnel, and public trust in government is at *near historic lows*.[28]

According to the Pew Research Center, "Fewer than three-in-ten Americans have expressed trust in the federal government."[29] In August 2016, the *Wall Street Journal* highlighted Gallup survey findings that "trust in the government's ability to handle domestic problems has never been lower in Gallup's trends, which stretch back to the 1970s."[30] As characterized by Don Kettl, a University of Maryland professor and former dean of its School of Public Policy, "enmeshed in this

dilemma of public distrust of government and public support for governmental programs is an accelerating interweaving of the public, private, and nonprofit sectors. Of course, scholars for a generation have pointed to the increasing hollowing out of government through indirect tools managed by proxies."[31]

The average civil servant is older today than the average civil servant a decade ago. More than a third of federal employees are eligible to retire. This is unprecedented. Government statistics show that the percentage of government employees under the age of thirty hit an eight-year low of 7 percent in 2013, compared with about 25 percent for the private-sector workforce. In 1975, more than 20 percent of the federal workforce was under thirty.[32] Fellowships and prizes are exciting offerings to attract new personnel, but they depend on establishing an *appealing* narrative about the impact and resources available in the federal government. Government needs to tell a compelling story about the meaningful work and career opportunities it has to offer—a new narrative will help retain talent, reinvigorate current personnel, and inspire *the next generation* of civil servants.

Government employees are patriotic, passionate, and driven by a desire to serve. However, at times there is willingness on the part of the public to dismiss federal employment as bureaucratic and inefficient. The fodder for such opinions is compelling. The first US chief technology officer, Aneesh Chopra, notes, "There's no disputing that American government, while accomplishing much that has gone unnoticed, has also rightly earned a good share of the cynicism and criticism that has come its way."[33] That said, Millennials believe in the promise of government. A 2014 Deloitte survey showed that about three-quarters of Millennials believe government has the potential to address societal challenges, such as lack of educational opportunities, the need for job skills and training, and protecting the environment.[34]

Some tactical investments in new processes and ideas have the capacity to attract a new workforce and generate tremendous impact. These include reimagining how government recruits and maintains talent, prioritizing use of data and technology within the White House and across agencies, and creating partnerships to achieve measurable outcomes for society. Prioritizing investment in innovation has the potential to build trust in government both among the general public and government employees, and that renewed trust will help attract the next generation of talent.

This is vital given that public-sector budgets are tight, but needs are expanding. Critical improvements to basic infrastructure alone will cost billions (e.g., decaying roads and bridges, public transit systems crippled by decades of deferred maintenance, arcane employment data management systems, and outdated, costly digital tools). Government needs to do more with less and *fast*. Marcus Peacock, who served as associate director at OMB and deputy administrator at the Environmental Protection Agency in the George W. Bush administration, has proposed "frugal innovation" as a possible solution—"frugal innovation happens when an individual with a flexible mindset and never-say-die commitment to finding a solution is faced with significantly limited resources...Frugal innovation is not a process or a technology...it is a mindset."[35] There needs to be a strategy to implement these ideas across government.

The following sections provide background analysis and recommendations on how to organize current offices, positions, and programs to build an innovation ecosystem in the next administration.

1

WHITE HOUSE & AGENCIES

White House—Recommendations

STRUCTURE

The organization of White House offices and how they prioritize innovation can drive change in federal agencies. Below are three options on how the White House can prioritize innovation. The base assumption of these recommendations is responding to the need to create an environment where innovation can become the norm, not the exception, in government. These recommendations suggest creating an assistant to the president (AP) who oversees the innovation portfolio as well as staff who collaborate with each other and with the agencies. Additionally, to have lasting impact, innovation, data, and technology need to be embedded through policy discussions, not just for certain deliverables or announcements. We recognize that these recommendations are not addressing the entire White House structure but are simply highlighting one aspect for innovation.

Option 1: Empower a Deputy Chief of Staff to Manage the Innovation Portfolio and Create Designated Deputy Assistant to the President in the Councils

Establish a deputy chief of staff (COS) position to manage the implementation of the federal government's innovation portfolio. The deputy COS would have a formalized role to act as the central coordinator of innovation priorities and activities, including the conversations led by current White House features (e.g., the Data and Digital Cabinets and the Technology Policy Task Force), and would serve as the White House's representative for the innovation agenda across agencies. The deputy COS would also work closely with key cross-agency groups and councils (e.g., National Economic Council (NEC), National Security Council (NSC), and Domestic

Policy Council (DCP)) to ensure effective scaling of innovation across agency initiatives. In addition to this deputy COS position, create a deputy assistant to the president (DAP) within each council (e.g., NSC, NEC, DPC) and empower the CTO and other relevant positions (e.g., chief data scientist) at OSTP to integrate and prioritize innovation in agencies. The DAPs would liaise with their agencies as the point of contact for data, technology, business model innovations, and the like, as well as address legal, policy, or other barriers identified by agencies or communities. In addition to reporting to their council leadership, this new DAP should also report to the deputy COS. The DAPs would report to their council heads but would also have direct reporting authority to the deputy COS tasked with implementation and innovation at the White House. The deputy COS would both oversee the DAP's work and set priorities for the innovation agenda in conjunction with the federal CIO and the OMB deputy director of management.

Option 2: Create an Innovation, Data, Evidence, and Adaptability Council at the White House (Executive-Level Leadership)

Create an Innovation, Data, Evidence, and Adaptability (IDEA) Council in the Executive Office of the White House (at the level of the DPC, NEC, and NSC). The IDEA Council would coordinate innovation and data offices across government, set priorities to deliver results on the president's agenda, and work with the OMB management team and the federal CIO to help achieve the outcomes set with the White House. It would also house and oversee the various innovation offices and fellowship models that have recently developed to bring new thinking into the DNA of government. The IDEA Council would work in conjunction with a deputy chief of staff tasked with implementation and innovation.

Option 3: Strengthen Innovation Capacity in OMB's Management

Strengthen the management side of OMB by creating a direct reporting relationship with a deputy chief of staff. Empowering management in OMB to administer and motivate an innovation agenda would enable OMB to utilize its managerial and budgetary pull to coordinate, inspire, and enable innovative efforts across the federal government. This option requires clarifying and defining the roles and responsibilities of key officials, including those of the CTO and CIO, and addressing the question of external events and convenings, which have often been hosted by OSTP. OMB is largely an internal-facing agency, but to drive innovation it would need to be able to lead externally-oriented events and convenings.

POLICY

Manage Data as a Crosscutting Issue: The US government needs a strategy for the use of data. Initiatives such as open government and open data are important, but they also need to be connected to priorities. For instance, the application of data to solve for gun violence intersects with a wide range of issues from cybersecurity, to privacy, to criminal justice reform, to twenty-first-century workforce—and many parts of the government need to be involved to effectively address and manage these issues collaboratively. There is a need for strategy and a policy discussion on how to govern the use of data to protect and better serve the American people.

PEOPLE

Creating these new structures within the executive branch would also require clarifying the definitions of key positions and being able to attract new staff.

Clearly Define the Role of the Chief Information Officer and Chief Technology Officer: Articulate a clear definition of the role and responsibilities for the federal CIO, US CTO, and agency-level CIOs and CTOs. Establishing well-defined descriptions for these positions would enable personnel within the White House and agencies to understand how to utilize the resources of these positions, and provide clarity for who is responsible for proactively communicating with Congress and congressional oversight committees. Typically, a CIO's primary responsibility is to build internal systems for inherent governmental functions, and a CTO uses technology to delivery on the agency's mission. But this is just one definition, and there is ample evidence that how these roles are fulfilled varies greatly from one individual to another, to say nothing of how the roles are understood by personnel working beyond the office of the CIO and CTO.

The structure of these positions may differ across agencies, but with each agency and organization the roles and responsibilities must be clearly communicated. For instance, should a CIO's remit be limited to updating legacy infrastructure? IT management? Who should respond to and manage the agency's interface with congressional oversight? What precisely is the remit of the CTO? How should these positions be staffed, what are the skill sets needed to improve the White House's ability to communicate with Congress and the agencies? How is the CIO or CTO responsible for maximizing the quality and management of technology (e.g., procurement and usage)? How should these positions interact with related personnel, such as chief data officers, chief innovation officers, or chief risk officers, to promote new ideas while ensuring coordinated governance and avoiding redundancy and inconsistency?

White House—Analysis

Technology is transforming how we live our lives with new solutions in health and education, to defense and beyond. At the same time, these new technologies and the data they collect have triggered a need for rapid policy and governance change. For example, questions about technology include: how should government procure technology; what types of technology are needed (e.g., open source, enterprise solutions, and so on); and how can technology be used to help government be more responsive to citizens. Policy questions include: what are the jobs of the future; what is the future of education in the digital economy; can digital tools promote financial inclusion; and who is able to participate as new digital tools become the norm of practice, and who is excluded. Additionally, this raises questions about the role of data: how can government use data to make smarter decisions; what types of data should government collect; and how can the government work more effectively by utilizing and analyzing private-sector data. Finally, these new technologies pose ethical questions: how should data be collected; who owns data; what are cybersecurity concerns; and how is a digital monopoly defined and regulated.

The Obama administration has taken on many of these issues, in part by creating new offices and initiatives, such as empowering data science (including social and behavioral sciences), establishing the US Digital Service and 18F, promoting new public-private partnership models and social innovation programs, and creating evidence-based policy initiatives. The incoming administration has the opportunity to establish the next iteration of these efforts by structurally enabling their convergence. This section analyzes innovation within the White House, focusing particularly on data, technology, and digital initiatives and personnel within the Obama administration, and then describes three possible structural inroads for institutionalizing the next iteration of these efforts.

The White House in a Digital Age

The first White House emails were sent during the Clinton administration, and government officials used pagers.[36] The rapid development of technology since that time has required vast policy changes, such as crafting open government plans,[37] devising digital strategies,[38] and setting digital milestones.[39] The Obama administration has actively engaged with many of these issues. For example, one of the administration's earliest actions was an open government directive issued by the Office of Management and Budget in 2009.[40] This new policy asked executive departments and agencies to take specific actions to implement the principles of transparency, participation, and collaboration to create more open government.[41] Soon thereafter, the administration created the White House's Open Government Initiative,[42] Cloud.gov,[43] Data.gov, and other online platforms to further enable the government to utilize the technology of our time.

The influence of digital media on the inner workings of the White House has been significant: digital media has changed how the president communicates and interacts with the public. Obama is the first president to run and lead entirely within the social media age.[44] Consider this: Twitter launched in 2006, and after a few years of trial and error spiked from 100 million users in 2011 to 200 million by 2012;[45] Facebook in less than ten years went from being a friends and family sharing site to a global corporation with more than one billion users and was ranked as Standard & Poor's ninth-largest company, with a greater market value than either Walmart or Procter & Gamble.[46] Over the course of the Obama presidency, the White House has transformed its communications practices from press releases and news conferences to harnessing the power of new digital tools. In 2009, an Office of Digital Strategy was created to ensure that the voice of the president is communicated with unprecedented immediacy and accessibility.[47] Digital Strategy launched the "We the People" petition website, a platform for citizens to more directly communicate with and lobby the government.[48] In 2015, the first Chief Digital Officer was appointed to oversee the White House's digital outreach and communication with citizens, and also coordinates the White House's Digital Cabinet.[49]

SocialGov

The Federal SocialGov Community, created in June 2012, exists within the DigitalGov platform at the General Services Administration's Office of Citizen Services and Innovative Technology. SocialGov is a blog that offers collaborative models for cross-agency knowledge management. Its goal is to empower civil servants with the resources to curate best practices; research, organize, and host social media trainings; test and evaluate emerging social tools and strategies; and organize productive working groups that produce shared resources, such as the US Public Participation Playbook or the Social Media Cyber-Vandalism Toolkit.[50]

SocialGov operates within DigitalGov, which works to integrate citizens into government more effectively and to build expanded information outreach. As such, SocialGov serves to assist government agencies with adopting best practices for social media at all levels of government, thereby enhancing outreach and fostering more connections with the public. The SocialGov Community also convenes to discuss new or increasingly important resources and considers how to make those resources available to agencies and government organizations.

White House: Managing Digital Services

This section lays out some of the digital service delivery mechanisms created during the Obama administration and their origins in previous administrations. While not comprehensive, this section aims to convey the vastness of both the accomplishments achieved to bring new technology and improved services to the public as well as the structural supports that still need to be implemented to embed digital services and the insights they provide within the federal government.

Healthcare.gov led to the creation of the US Digital Service. Obama described the creation of USDS as building a technology and digital services SWAT team.[51] Housed in the Office of Management and Budget and with digital service teams in place across agencies, USDS has an appropriated budget, and its staff operates like a consulting service within the federal government to provide project management, product design, and engineering support to federal agencies working to modernize their digital services.[52] USDS is working on high priority digital services across government. The goal of USDS is to bring top private-sector talent (designers, engineers, product managers, and digital policy experts) into the government to help transform and deliver critical digital services for US citizens.[53] (See Appendix B: *Government Innovation Program Examples*, and Appendix C: *White House Innovation Chronology—Programs & Offices* for further detail.)

A precursor to USDS was the Presidential Innovation Fellows (PIF) program to bring personnel with innovative skills into government. The PIF program is housed at the General Services Administration, which is also home to 18F. Set up to provide services to agencies across government, 18F is a fee-for-service digital consultancy. In spring 2016, the General Services Administration (GSA) launched the Technology Transformation Service (TTS). Today TTS houses 18F, the Office of Citizen Services and Innovative Technologies, and the Presidential Innovation Fellows program. TTS joins GSA's two other service lines, the Federal Acquisition Service and the Public Buildings Service. USDS, 18F, PIF—all of these new programs have infused the federal government with cutting-edge skills and insights, and the incoming administration has the opportunity to craft the next iteration of these critical service delivery resources.

18F

18F is a digital consultancy within the General Services Administration (it's named for GSA's location at 18th and F streets NW in Washington, DC) to enable agencies to rapidly deploy tools and services that are easy to operate, cost-efficient, and reusable.[54] 18F's team of skilled designers, developers, researchers, federal employees, and product specialists is a growing group with staff situated around the country in Washington, San Francisco, Chicago, New York, Dayton, and a handful of other cities. Recent projects include supporting the development of Navy Reserve "Ready to Serve" (R2S),[55] the Department of Education's Collegescorecard.ed.gov,[56] and Analytics.usa.gov.[57] In spring 2016, GSA launched the Technology Transformation Service (TTS), which houses 18F, the Office of Citizen Services and Innovative Technologies, and the Presidential Innovation Fellows (PIF) program.

Improving Healthcare.gov was an instructive moment for government, raising questions about technology procurement, integration, and user needs. Lessons from Healthcare.gov's initial launch illustrate the value of including technology expertise at the table from the start and understanding user needs. Government needs to get away from reactive policymaking, and efforts such as USDS and 18F have been critical developments to spotlight the utility of new methods, pilot new projects, and demonstrate how technology can enable government to be more adaptable, responsive, and proactive.

A key position in the federal government's management of digital services is the role of the federal chief information officer (CIO),[58] which was created in 2001 by the Bush administration and was later codified under the E-Government Act of 2002.[59] At that time the position was called the administrator for e-government and information technology;[60] during the Obama administration it was renamed and gained expanded authority with the title of federal CIO.[61] The role of the CIO is to oversee the planning of IT investments at the federal level, including the budgets and policies associated with technology acquisition and investments. The CIO also oversees critical issues of how information is shared and kept private both for and within the federal government. The federal CIO is positioned under the deputy director for management of OMB[62] and serves as the de facto chair of the CIO Council.[63] The federal CIO controls a significant budget that is larger than the digital offices and can play an important leadership role to help the government modernize and better manage federal IT and digital infrastructure.[64]

Toward More Flexible Procurement

Traditional government IT procurement is sequential and heavily bureaucratized, and the ability to adopt and adapt to new technologies is at odds with the inflexibility of traditional federal procurement processes.[65]

During the Obama administration, the infusion of digital-savvy personnel has helped usher in the use of new, more flexible procurement practices. For example, 18F's Agile Delivery Blanket Purchase Agreement (BPA)[66] offers a streamlined approach to procurement: by requiring vendors to submit publicly available working prototypes the Agile BPA not only increases transparency, but also allows government agencies to see the vendor's work prior to a formal engagement.[67] The Agile BPA shifts government agencies away from sequential procurement and toward a more incremental approach where rapid prototyping and iteration are part of standard practice. 18F's Agile BPA recently granted its first contract for the development of FedRAMP[68] (Federal Risk and Authorization Management Program)[69] and is looking for a vendor to help develop a citizen-facing "authorization" platform to streamline citizen interaction with government services.[70]

Agile methods support more modular IT development, prioritize the training of more IT acquisition professionals in government, and require more cross-agency, collaborative, user-centered, and iterative IT procurement methods. For example, the Federal Information Technology Acquisition Reform Act (FITARA) simply aims to standardize best practices in IT management by outlining a set of procedures, policies, and practices and by clearly defining the role and authority of agency CIOs in IT procurement decisions.[71] Properly implemented, FITARA can support the development of effective and efficient IT systems by clearly defining the governance structures in the procurement process.

More flexible procurement policies can support the need for stability and innovation in government. They provide a level of accountability and risk management while supporting an environment of experimentation and innovation across government and among government vendors.

White House: Technology & Data

In 2009, the role of US chief technology officer (CTO) was created by the Obama administration within the White House Office of Science and Technology Policy (OSTP) to lead the administration's efforts to unleash the power of technology, data, and innovation.[72] This position was created out of the associate director of OSTP role and serves as an assistant to the president to help the country meet its goals for creating jobs, reducing healthcare costs, and addressing homeland security. Since 2009, several other key positions have been created at the White House and beyond, including a US chief data scientist,[73] chief digital officer,[74] technology advisor in Silicon Valley,[75] and a State Department representative to Silicon Valley. Also, Chief of Staff Denis McDonough leads the White House's Tech Policy Task Force. The task force has created an opportunity for various offices to work together, discuss core issues, and build trust by establishing a rapport. The Digitial and Data Cabinets coordianted by the chief digital officer and the chief data scientist, respectively, have fulfilled a similar role. (See Appendices C and D for an illustrative chronology of key innovation offices and positions at the White House.)

The Office of the US CTO and the chief data scientist have been instrumental in supporting the Obama administration's emphasis on the use of data and ensuring data is interwoven into policy decisions. One aspect is the Digital Government Strategy and open data efforts including the Open Data Executive Order,[76] and Data.gov.[77] Another is ensuring data policy questions are integral to a range of policies. For example, precision medicine,[78] artificial intelligence,[79] self-driving cars,[80] and criminal justice reform, such as the Data-Driven Justice Initiative.[81] The White House has led the way toward expanding access to data and using more evidence-based decision making. The president's leadership is critical for these initiatives to succeed.

The use of data is crosscutting and requires collaboration across departments and agencies as well as across civil society and the private sector. For instance, utilizing data in criminal justice reform[82] requires an intensive, dynamic engagement across multiple departments, engaging not just the Department of Justice but also the Departments of Labor and Commerce—and that's just at the federal level. Furthermore, the uses of data are not immune to discrimination. The White House's most recent big data report, "Big Data: A Report on Algorithmic Systems, Opportunity, and Civil Rights,"[83] highlights the significance of creating governance structures to address the questions of algorithmic decision making and to avoid inadvertently perpetuating discrimination. In the next administration, further clarification about the roles of the CTO and the chief data scientist could help expand these priorities—(e.g., could the CTO be positioned within NEC as a policy leader or become a 'dual-hatted' position with responsibilities to NEC and DPC; and could the data scientist role more effectively drive data initiatives with more authority within DPC or could this role also straddle two councils). Alternatively, to further develop data initiatives within the White House create a coordinating body to drive new ideas and incentivize agencies to find solutions (see below for suggestions on how to structure this new office).

White House: Three Structural Approaches to Institutionalizing Innovation

While enhancing government's use of technology, data, and digital tools has created excitement about government, the ultimate goal of such efforts is to improve and restore the public's trust. Public trust in government remains at near historic lows. How can data be created and leveraged, and how can the public be assured that government is listening to citizens, not just reporting to them? Policymakers need to continually ensure they are responding to public concerns and solving for public problems to enhance people's lives. Questions include: how to make government more open and responsive, how to build the tools such that open data, once available, can be given back to the people, how to work more effectively with cities and states, and what are the necessary process enhancements to scale citizen-centered governance?

An office or strategy for innovation in government (or government transformation) should be focused on culture change—providing the room to "fail forward," to take risks and make (small) mistakes, to experiment, launch, and reiterate—and once something works, to ascertain how it can be scaled. Several current

innovation offices have been able to succeed precisely because they are *not* institutionalized and have flexibility. How can the energy and momentum of new hires and offices translate into lasting incentives for staff across government to innovate?

A goal of this report is to embed innovation in federal policymaking, to create a space within the White House where data, technology, and other innovations, such as public-private partnerships, are prioritized. In the last transition, the focus was on creating offices within the existing infrastructure. But research and analysis show that in order to drive change, data, technology, and innovation need to be part of every conversation at both the White House and the agencies; this means that the next administration should consider some new structural approaches.

Below are three structural approaches that could help prioritize innovation, data, and technology within the next administration. This report does not espouse a specific approach; rather, it is presenting these structural options to help orient conversations about possible next steps.

Option 1: Empower a Deputy Chief of Staff to Manage the Innovation Portfolio and Create Designated Deputy Assistant to the President in the Councils

This option recognizes the value of data, technology, and innovation and the need to integrate them into the federal government. It elevates the conversation from "nice to do" to "have to do." The next administration would establish a deputy chief of staff (COS) position to manage the implementation of the federal government's innovation portfolio. The deputy COS would have a formalized role to act as the central coordinator of innovation priorities and activities, including the conversations led by current White House features (e.g., the Data and Digital Cabinets and the Technology Policy Task Force), and would serve as the White House's representative for the innovation agenda across agencies. The deputy COS would also work closely with the President's Management Council, the Federal CIO Council, and other key cross-agency groups to ensure effective scaling of innovation across agency initiatives. Specifically, the deputy COS would set priorities for the innovation agenda in conjunction with the federal CIO and the OMB deputy director of management.

In this scenario, each council—the National Economic Council (NEC), Domestic Policy Council (DPC), Office of Science and Technology Policy (OSTP), and the National Security Council (NSC)—designates a deputy assistant to the president (DAP) to focus on innovation. The designated innovation DAP would report to the deputy COS of innovation and implementation. The tools of data, technology, or innovation might differ for each agency and council, but this new DAP position would be able to prioritize the agenda and could facilitate learning across agencies. For instance, NEC's DAP would work on the challenges, opportunities, and other issues surrounding mobile money with the Treasury Department and OMB as well as with independent agencies such as the Securities and Exchange Commission and the Federal Communications Commission. Or, DPC's DAP would work with the Department of Justice, the Department of Health and Human Services, and the Department of Labor on helping released prisoners find and maintain jobs. Alternatively, to help prioritize the innovation agenda in OSTP there could be an assistant to the president to lead the science division (e.g., the Cancer Moonshot mission), and an AP or DAP to coordinate and oversee the responsibilities of the Office of the CTO, the various White House data initiatives (e.g., chief data scientist, data council, etc.), and business model innovation efforts. (See Option 1 in Appendix E: *White House Structural Recommendations*.)

The DAPs would liaise with their agencies as the point of contact for data, technology, business model innovations, and so on, as well as addressing legal, policy, or other barriers as identified by agencies or communities. The DAPs would report to their council heads, but also have direct reporting authority to the deputy chief of staff (COS) tasked with managing implementation and innovation at the White House.

Option 2: Create an Innovation, Data, Evidence, and Adaptability (IDEA) Council at the White House (Executive-Level Leadership)

Option 2 proposes a new office, the Innovation, Data, Evidence, and Adaptability (IDEA) Council, in the Executive Office of the White House (at the level of the DPC, NEC, and NSC). The IDEA council would coordinate innovation offices across government, set priorities to deliver results on the president's agenda, and work with the OMB management team and the federal CIO to help achieve the outcomes set forth. The IDEA Council would also house and oversee the various innovation offices and fellowship models that have recently developed to bring new thinking into the DNA of government, such as USDS, 18F, the Office of Social Innovation and Civic Participation, the Social and Behavioral Sciences Team, and the Presidential Innovation Fellows. It would also coordinate the related innovation work currently situated at OSTP. By integrating and coordinating these various initiatives into one Executive Office Council, the insights and efficiencies of data, evidence-based policymaking, and digital tools would be better organized and structured and thus made available to help address some of the most critical issues of our time (e.g., poverty, criminal justice reform, economic inclusivity, and beyond)—this would be the mission of the IDEA Council. (See Option 2, Figure 1 in Appendix E: *White House Structural Recommendations*.)

By situating the new IDEA Council in the Executive Office, innovation would become a *structurally supported* priority at the highest level. This is a significant proposal not only because there are other pressing priorities for the next administration, but also because many existing offices and initiatives already seek to house this type of work. Creating a new office at such a high level strikes at the core of both of those issues—prioritizing innovation is not done at the expense of other pressing priorities and initiatives, but rather with their very significance at top of mind.

The IDEA Council would be composed of various offices:

- **Legal:** Legal counsel needs to be horizontally integrated into the processes of the IDEA Council. Understanding legal hurdles and finding solutions early in the process would be critical for innovation to achieve scale. Drawing upon a private sector configuration, a product attorney or similarly skilled attorney would ensure that program development from ideation to procurement and implementation are done with legal personnel *throughout* to enable minor shifts and pivots from the beginning.
- **Personnel:** The council would work with White House personnel and the Presidential Personnel Office to find the right people and to create flexible hiring structures to attract new talent. It would also encourage agencies to use flexible hiring authorities.
- **OMB and Federal CIO:** The council would work closely with the OMB management team and the federal CIO; indeed, they could be part of the council. Creating a strong link between OMB and this new council would empower the innovation agenda by connecting the budgetary resources and regulatory requirements of OMB directly to these new efforts.
- **Programming:** To deliver on programs and have social impact, the work that falls within the Office of Social Innovation and Civic Participation and the Social and Behavioral Sciences Team should be included in the IDEA Council to deliver solutions on, for example, improved reading skills for children, diabetes prevention, and other improved outcomes.
- **Cybersecurity:** The council should work closely with the NSC but the council itself should include internal experts who can anticipate security challenges in a digital space. Cybersecurity is a critical, crosscutting area, though a thorough consideration of the structures needed to manage cybersecurity at the White House is beyond the scope of this report. It would be critical to bring in leadership that is not only able to craft effective policy, but also possesses practical, real-world experience in managing and solving cybersecurity crises.
- **Privacy and Citizen Services:** The council would need to include someone who understands the relationship between privacy in public policy while also protecting the rights of citizens, including how private data can and should be used.

- **Procurement and Acquisition:** A partnership with OMB is critical to address the legal aspects of procurement, while finding the best practices so government can deliver more effective services.

(See Option 2, Figure 2 in Appendix E.)

It may appear contradictory to propose the creation of yet *another* department within the federal government at a time of limited financial resources. But centralizing data and technology within a new White House council could improve service delivery to citizens by building efficiency into entrenched and outdated processes, establishing standards of practice and performance goals to better utilize existing personnel within the White House and agencies, and creating opportunities to infuse new talent with cutting-edge skills from the private sector into the government. Furthermore, consolidating disparate, nascent innovation initiatives would save taxpayer dollars. This is about doing more with less, about formalizing piloted concepts from the outgoing administration to institutionalize innovation. For example, the work and missions of the Obama administration's Office of Social Innovation and Civic Participation and the Social and Behavioral Sciences Team would be absorbed into the programming of the IDEA Council. The IDEA Council is a convergence of the many developments that took place during the Obama administration, and it offers a way to capture the principles and priorities of those new offices and positions.

IDEA Council & OSTP

The creation of the IDEA Council would also require rethinking OSTP, as it operates today. Briefly, the Office of Science and Technology Policy was created by a congressional mandate in 1976[84] to furnish the president and the Executive Office with expert advice on science and technology. According to the Congressional Research Service, "The creation of OSTP provided a new structure for the provision of science and technology policy advice to the President, but did not end Presidents' authority to appoint advisors in parallel. The OSTP director is a statutory position; the authority to appoint others to assist the President exists solely with the President."[85]

OSTP grew out of a long legacy of carving avenues into the White House for science and technology expertise, and it has a broad mandate to advise the White House on matters of science and technology. OSTP's stated mission is:

1. To provide the President and senior staff with accurate, relevant, and timely scientific and technical advice on all matters of consequence;
2. To ensure that the policies of the Executive Branch are informed by sound science; and
3. To ensure that the scientific and technical work of the Executive Branch is properly coordinated so as to provide the greatest benefit to society.[86]

OSTP serves as a repository for issues related to science and technology—from serving as the White House's research and development (R&D) team,[87] to championing policy changes, to prioritize the STEM education fields of science, technology, engineering, and mathematics.[88] OSTP ensures a place for scientific and technological expertise at the White House. Furthermore, OSTP exists to "lead interagency efforts to develop and implement sound science and technology policies and budgets, and to work with the private sector, state and local governments, the science and higher education communities, and other nations toward this end."[89]

Today, OSTP is home to both the how and what of innovation, but the uses and application of technology and data have boomed in the forty years since OSTP's inception. In the next administration, it may be worth considering a reconfiguration of the responsibilities of this office—a well-thought-out bifurcation of OSTP's responsibilities, particularly in respect to technology, may better enable the White House to develop expanded technology-enabled capacities and to better champion and manage evidence-based policy and data use. This shift of responsibilities from OSTP into the IDEA Council could carve out a more distinct, robust R&D and technology policy focus for OSTP while simultaneously enabling the new executive-level office to focus on and administer the ever-growing fields of application for data and technology. OSTP has served as a leader for external convenings at the White House,

bringing together stakeholders around key policy issues. Potential structural changes would also need to address the question of who serves as an external convener at the White House. (See Option 2, Figure 3 in Appendix E.)

Why Create a New Executive Office?

There are several pros and cons to creating a new office at the White House.[90] By creating a new office, as with many of these recommendations, nascent and fragmented innovation efforts can be matured and united to thrive.

CONS

- **Yet Another Office:** There are already many offices within the federal government, so it would inevitably be easier to work within the structures and positions already in place to increase awareness and expand the adoption of different approaches to innovation.
- **New Politics:** Establishing a new office means new politics; establishing a council with the notion of, among other things, housing risk-oriented projects, is challenging. A new office means new politics plus new regulatory, priority, and interpersonal hurdles, and at the start of a new administration there is immense pressure to achieve substantive results *rapidly.*

PROS

- **Centralized Management:** A centralized office within the White House would unify disparate agency innovation labs, new technology leadership positions, and new initiatives that champion the use of data and evidence. Centralizing management of these efforts would not subordinate agencies' work; instead, it would complement it—by creating a space for collaboration, an outlet through which disparate innovation efforts across agencies can be communicated, debated, and critiqued. Their ability to share lessons would help avoid waste, enhance efficiencies, and, eventually, achieve scale across government.
- **Prioritized at the Top:** Having a seat at the table is essential to prioritizing this work, and localizing innovation efforts at the Executive Office level would incentivize agencies throughout government to take action. Communicating strong support for innovation, particularly through the use of data, technology, and evidence, would help the White House better manage critical crosscutting issues, and, by consequence, would situate these efforts front of mind for agency leadership and staff.

Option 3: Strengthen Innovation Capacity in OMB's Management

A third option for structuring innovation within the White House could be achieved by strengthening the management side of OMB to drive innovation efforts. Empowering management in OMB with administering and motivating an innovation agenda would enable OMB to coordinate innovation across the federal government. OMB could utilize its managerial and budgetary pull to coordinate innovation across the federal government. This would also require establishing a direct reporting link to a deputy chief of staff tasked with implementation.

In many ways, OMB management is perceived as the locus of government compliance, but by reconfiguring responsibilities housed in OMB to champion and enable innovation, the significant reach and influence of management could be deployed to spur a system-wide change in government. This option requires clarifying and defining the roles and responsibilities of key officials, including those of CTO and CIO, and addressing the question of external convenings, which have often been led by OSTP.

Agency—Recommendations

Agencies also need to prioritize innovation, but each agency's approach will vary depending on its particular needs. There is no checklist for innovation; it requires agencies to prioritize outcomes and look for innovative tools and models that can help them deliver results, but these recommendations do not propose a prescriptive model to define "agency innovation." Regardless of the precise formulation of innovation efforts within an agency, changing government culture to be more adaptive and open to innovative approaches would require collaboration across political and civil service staff. Most importantly, these offices need to receive the financial resources to operate effectively.

STRUCTURE

Ensure Agency Leadership for Innovation Offices: Agency innovation offices should report to the secretary or deputy secretary. For innovation to be prioritized, either the secretary or deputy secretary needs to oversee innovation work. This would help create the appropriate incentives for personnel within agencies to be empowered to innovate on solutions. This structure would empower innovation within agencies, integrating with technology, acquisition, program, and other key stakeholder offices.

Provide Clear Job Descriptions: Agencies need to provide clarification on job roles and responsibilities. Many new positions are being integrated into the structure of agencies, such as chief technology officers, chief information officers, even chief innovation officers, but there is an immense variety and ambiguity about the exact responsibilities of those positions across different offices. Providing a clear description for these new positions is critical for establishing clear reporting and management structures within agencies, for recruiting personnel to these new positions, and for managing and fulfilling oversight and regulatory requirements, such as FITARA, which specifies particular reporting obligations for CTOs.

POLICY

Encourage Cross-Agency Collaboration: To drive a culture change and have lasting impact, agencies would need to work together, including creating shared resource pools, setting a shared agenda and metrics for success, and establishing interoperable technology systems. For instance, the potential for sharing data across government agencies has many possibilities, but to effectively utilize these resources agencies need to be able to work in a coordinated and collaborative fashion.

Create a Cohort: Agencies across the government are piloting new innovative initiatives, but they need to exist within a cohort where successes, challenges, and lessons-learned can be communicated and critiqued. Creating a cohort for these efforts would reduce waste, mitigate risk, and enhance efficiencies, and it can help these programs achieve scale more rapidly across government. Reporting to a deputy COS and having coordination from the White House would be important.

PEOPLE

Provide Agencies with Flexibility to Determine their Digital and Data Staffing Needs: Each agency would have varying needs for what it defines as governance innovation. For instance, the Department of Commerce, which houses data from the Census Bureau and NOAA (the National Oceanic and Atmospheric Administration), would likely have a different approach to governance innovation from that of the Department of Transportation. While agencies need to be able to staff their projects and initiatives to meet their individual needs, the White House can serve as a centralized champion to communicate the significance of digital and data applications; this would give agency personnel and leadership the leverage they need to pilot and prioritize new approaches.

Agency—Analysis

Presidential administrations have taken different management strategies for agencies. For example, President George W. Bush enacted the President's Management Agenda.[91] In cabinet meetings, he would run through the Management Agenda's dashboard to gauge agency progress[92] toward change, calling out agencies on how they were doing on a scale of green, yellow, or red.[93] In the Clinton administration, the president appointed Vice President Gore to lead the government reform efforts. Gore created momentum for significant changes that have since been implemented.

Today, while there are many leaders for the innovation agenda within the White House and agencies, no one person or office is charged with managing and implementing that agenda. And while data and technology innovations have received attention, social innovation at the Department of Education, HUD, Treasury, Corporation for National and Community Service, and other departments has gained significant traction, but remains less well-known. The Obama administration has enhanced relationships with foundations, created unique public-private partnerships, and spotlighted the need for markets to define impact. The next administration can build upon these initiatives by creating an architecture that embeds new, effective models and enables the adoption of future alternatives.

Agencies also need to be able to liaise with the White House, train internal teams, and build agency capacity. Innovation, whether it is about technology, social, or data, has thrived in agencies that have a strong team supported by senior management, especially at the deputy secretary or deputy administrator level. Agencies should partner political appointees with career civil servants, because their collaboration can yield insights.

Building Digital Service Teams & Data Capacity

In 2014, the US Digital Service launched the Digital Services Playbook[94] to help embed best practices to meet citizens' needs throughout government service delivery. Building off of this digital service model, there is a movement to establish digital service teams throughout the federal government. OMB has instructed USDS to set up satellite digital service teams within twenty-five agencies.[95] As of June 2016, digital service teams have been set up in six agencies: the Departments of Defense, Health and Human Services, Homeland Security, State, Treasury, and Veterans Affairs.[96]

Each agency does not necessarily need an entire digital team; a few key hires could be sufficient to internally build tech- and data-use expertise and capabilities based on whatever problem or problems a particular agency is trying to solve. Some agencies, such as the Departments of Agriculture, Commerce, Energy, Interior, Justice, Labor, and Transportation, as well as USAID, would like to build their own digital teams, but building a digital team often means overcoming budget challenges.[97]

Beyond Digital to Programming

In an effort to integrate new practices, tools, and personnel, many agencies have defined innovation differently, with some focusing on other challenges such as programming. For instance, USAID set up the Global Development Lab to concentrate on finding, testing, and scaling proven ideas to address global challenges. The Department of Commerce, the repository of some of the most unique data in the world, including data from the National Oceanic and Atmospheric Administration and the US Census Bureau, plus economic forecasting,[98] chose to focus its innovation efforts on uses of data, for example, by creating data-sharing agreements with agencies and helping agencies better leverage and analyze data (e.g., Census data and data from the Supplemental Nutrition Assistance Program to provide policy insights).

Overall, agencies would need to define their own priorities. There is no such thing as a one-size-fits-all model. For some agencies, innovation would be driven by technology or data; for others, it is about scaling programs that work. What agencies need is a model with enough centralization and senior level support to create a coherent narrative. They also need flexibility to build their own capacity and for their leadership to allow and incentivize learning.

Move Beyond Discretionary Budgets

Concerns about how capital is allocated to enable innovation was one of the most commonly expressed concerns from both political appointees and civil service employees in our interviews. While there are a lot of public announcements about innovation projects and cool ideas, some observed that little has changed at the agencies, particularly in terms of technology and program funding streams. Various small pots of discretionary dollars may add up to $100 million, but in terms of systemic impact given the trillions within the federal budget, much remains to be done. Enabling these pilot programs to grow and achieve scale means connecting the innovation agenda with capital.

2

POLICY INNOVATION & PUBLIC-PRIVATE PARTNERSHIPS

Recommendations

Improving services and creating a more effective government requires recognition that government cannot do it alone. Rather, twenty-first-century governance relies on engaging a variety of stakeholders to achieve greater impact, outcomes, and cross-synergies. Change demands shifting not only procurement policy, but also an entire interdependent network of policymakers and stakeholders. Structurally enabling a culture of innovation in the federal government requires a multifaceted approach.

While tools are important for innovation, policies are critical for long-term success and scale. The next administration has an opportunity to design and formalize these policies, such as engaging crosscutting expertise on issues at the intersection of tech and innovation, including cyber and privacy; effectively using data and innovation within and across government; adopting new models of financing and public-private partnerships; and enabling modern and effective citizen-facing services for more responsive governance. Innovation units across the federal government and localities around the country are working on parts of this approach. The recommendations in this section offer possible approaches to take lessons from these pockets of innovation to create a more systemic change.

STRUCTURE

Oversight Commission: Within six months of taking office, the next administration should create a bipartisan commission to conduct an audit to analyze the various avenues for innovation in federal government, including law, policy, technology, processes, people, and organizational structure. It would provide recommendations to Congress about how to improve innovation throughout the government. Congress will need to be a partner for long-term change.

Develop Metrics for Success Toward Long-Term Funding Structure: Due to the limited availability of nuanced metrics to track outcomes and "success," current innovation units suffer from funding instability. As a result, these units cannot plan for long-term policy implementation. Limited funding mechanisms curtail the ability to institutionalize innovation. A more systematic approach is needed for agencies to not only track progress and outcomes, but also to document process change. Identifying measureable outcomes can also help establish a more sustainable funding stream.

POLICY

All Levels of Government Need to Work Together: The next administration can truly put the American people first by creating appropriate incentives to achieve outcomes, expand access to public data, use data for better decision making, create models for more effective public-private partnerships, and leverage technology to provide better services to citizens. The federal government has an opportunity to find new ways to work with state and local governments by creating incentives and engaging them to identify cutting-edge solutions or to scale solutions that have already been proven to be effective.

Adopt Flexible Procurement Policies: Modern, agile methods and policies increase the flexibility of government IT procurement processes by aligning the acquisition and budget processes with the technology cycle. Agile methods support the development of more modular IT development, prioritize the training of more IT acquisition professionals in government, provide numerous avenues for more efficient IT spending, bring innovation into the selection of contractors and oversight of contract execution, and require more cross-agency, collaborative, user-centered, and iterative IT procurement methods.

Take Innovation Sprints: The government should encourage "innovation sprints" with a specific agency, groups within an agency, and/or as a collaboration of agencies working on a problem together within a limited time frame. A few key problems could be addressed with radical experimentation to trigger change. This could include testing flexible hiring and procurement, or implementing new financing methods that create aligned incentives. Quick and agile sprints would use data and measure outcomes. The process, from identifying problems to developing solutions, would be fully transparent and accountable to the American public. Also, as a means for delivering solutions, if the most important issues were tackled as cross-government initiatives, an innovation sprint would create a sense of urgency and mission, thus enabling the sprint team to pull in the right expertise from across agencies and to leverage different authorities from each agency to quickly achieve an outcome.

Innovation Units as Risk Aggregators: Innovation units can position themselves as risk aggregators, as is often practiced by the Mayor's Office of New Urban Mechanics in Boston.[99] Innovation units, spanning all levels of government, can encourage others across government to take risks and employ creative thinking. Innovation units can mitigate the impact of risk on personnel by offering an enabling environment that promotes experimentation with the understanding that it does not always yield the desired result, and where personnel are insulated from negative consequences that might result from the innovation unit's involvement.

Support Outcomes-Focused Funding: An outcomes fund should be created in partnership with the private sector and philanthropy. Such a fund would spur innovative solutions—financing mechanisms, programs, or method—with payments based on results. An outcomes fund would create a market for programs and policies that achieve outcomes. As outcomes are achieved, the pool of federal dollars dedicated to outcomes-focused programs and contracts should also be expanded. As capacity

improves and models are proven, government should eventually base more mandatory funding on the achievement of outcomes. A fund would help policymakers gain more insight into what types of innovations—programs and policies—work and the appropriate methodologies that can best measure and evaluate their impact. Over time, government can then reallocate money from less effective models and policies to more effective ones. This will require congressional support. As returns on investment are demonstrated, the executive branch could work with Congress and the private sector (e.g., foundations) to expand the use of outcomes funds and innovative finance mechanisms such as pay for success.

Move Successful Pilots through a Pipeline: In a funding pipeline, programs and policy models become eligible for a larger portion of dedicated public spending when confidence grows about the ability of a specific approach to achieve its intended outcomes. Spending could be broken into tiered evidence pools specifically designed to develop, refine, and scale outcomes focused interventions, depending on the number of trials or the level of available evidence. This type of funding is already happening at the federal level through such initiatives as the Investing in Innovation Fund (i3) and the Social Innovation Fund. At this stage, philanthropy and private-sector funders can partner with government to match funding and help create more transparent data analysis and knowledge sharing on what works.

PEOPLE

Leadership to Incentivize Innovation: There are individuals and groups in agencies that would like to experiment with new approaches beyond innovation labs and technology. It may be innovative finance mechanisms or different approaches to solutions, however, sometimes there are no innovation offices to support these efforts. These agencies could create units that think about innovation as a horizontal function that can facilitate cross-agency solutions, such as the collaboration of education, transportation, and labor to develop the twenty-first-century workforce. Agency leadership is critical to support sustained risk taking and incentivize innovation in the fabric of agency policy.

Analysis

Policy innovation requires a multisector, multifaceted approach. This includes utilizing crosscutting expertise on issues at the intersection of technology and innovation, including cybersecurity and privacy; effectively using data and innovation within and across government; using new models of financing and public-private partnerships; and enabling modern and effective citizen-facing services for more responsive governance. Across the federal government and in localities from coast to coast, innovation units are working on parts of this approach. Establishing structural supports in the federal government can help take lessons from these pockets of innovation to stimulate a more systemic change.

Improving services and creating a more effective government require recognition that government cannot solve all of the challenges alone. Rather, twenty-first-century governance relies on a variety of stakeholders to achieve greater impact, outcomes, and cross synergies. Change demands more than just shifting procurement policy, it must also enable an entire interdependent network of policymakers, governments, and stakeholders.[100] This approach is not only about communicating with stakeholders, but also creating an engagement strategy to govern with stakeholders.

Structuring a working relationship with cross-sector leaders can help tap into that dynamic pool of expertise, which is otherwise widely distributed. As Beth Simone Noveck, a professor at New York University's Tandon School of Engineering, and co-founder and director of The GovLab at NYU, describes, "Opening up how we govern has the potential to yield *more and better insights* than those generated by government working alone."[101]

Government partnerships with academic institutions, private companies, and philanthropies can play an important role in improving service delivery and addressing some of our greatest challenges—creating structural supports to establish these collaborative partnerships is critical. From spurring collaborative efforts that solve challenging issues, to reducing inefficiencies in government spending, the efforts at

agencies and the available tools described below are examples of how a multisector approach can help governance.

Innovative Financing

In recent years, one of the areas in which public-private partnerships have been particularly successful is the advancement of innovative financing mechanisms for social good, such as impact investing and pay-for-success financing. Broadly speaking, impact investing refers to investments into companies and funds with the intention of generating measurable social and environmental impact and financial returns.[102] In the United States, impact investments are made by a variety of investor types, from philanthropy, to high net worth individuals, to corporate foundations, to mainstream banks. Each investor may have their own distinct investment strategies, but each formulation relies heavily upon the government and the regulations that make these kinds of investment possible. Pay for success is one type of impact investing and combines private financing with public interest to deliver outcomes.

In 2013, prompted by the United Kingdom's leadership at the G7, a group of twenty-seven impact investing thought leaders, including private investors, entrepreneurs, foundations, academics, impact-oriented organizations, nonprofits, and intermediaries, came together to form the US National Advisory Board on Impact Investing (US NAB).[103] This industry collaboration proposed concrete policy recommendations to align US regulatory policy with the issues that investors face in deploying capital for social good. Since the release of the US NAB's initial recommendations, the US Treasury Department, the Internal Revenue Service, and the Department of Labor have adopted regulations and implemented guidelines that make it easier for foundations to use program related investments (PRIs) as well as their endowments (mission related investments, MRIs) for investing in impact. Additionally, pension fund fiduciaries can now consider economic, environmental, social, and governance issues when making investments.[104]

In addition to the multisector collaboration that has advanced the field of impact investing, public-private support for innovative finance has contributed to a shift in practice from relying on outputs to outcomes by using evidence to measure public service delivery. One impact investing tool that has helped lead this change is pay for success (PFS), or, as it is more frequently referred to, social impact bonds (SIB). A SIB is a financial tool that is used to provide up-front capital for contracting arrangements in which payment for service delivery is linked to the achievement of measurable outcomes. A SIB shifts risk from service providers to private investors (both commercial and philanthropic) and ensures that back-end payers, such as the government, pay only for programs that achieve their intended outcomes.[105] One important aspect of these agreements is the role of a third-party evaluator; they verify the results. In the US, the first SIB deal was launched in 2013; today there are ten active deals and close to one hundred in development.[106] Internationally, there are fifty SIBs that are either active or in development. In the US this expansion has in large part been led by cities and states with bipartisan support. The rapidly growing number of SIBs around the world is a testament to the powerful role that multisector projects can play in spurring the more efficient and effective use of public resources. The structure and incentives of public funding deeply inform how government thinks about, creates, and implements social policy.

Prizes & Social Innovation Funds

Social Innovation Fund (SIF): SIF was created in 2009 and is housed in the Corporation for National and Community Service. It directs public and private resources to community-based organizations with demonstrated results in the areas of economic opportunity, healthy futures, and youth development. The SIF also has a 100 percent match requirement: it provides annual grants of $1 million to $5 million to local intermediaries and is structured to maximize funding for communities by requiring intermediaries and their nonprofit implementing partners to match federal funds dollar-for-dollar.[107] SIF also has a strong focus on results and provides both technical assistance and program evaluation funding to various implementing partners.[108]

Investing in Innovation Fund: The i3 fund was created at the Department of Education during the American Recovery and Reinvestment Act in 2009. Housed in the department's Office of Innovation and Improvement, i3 promotes public and private investments in local educational agencies and nonprofit organizations with the aim of improving student achievement and attainment in low-income communities and ultimately creating an education sector that supports the rapid development and adoption of effective solutions. It provides competitive grants to school districts, nonprofit organizations working with districts, or a consortium of schools with a record of improving student achievement and attainment, and demonstrated public-private commitments. Grant awards vary based on the type of activity: scale-up, validation, or development. All grantees are expected to obtain private-sector matching funds or in-kind donations to support their program.

Social Impact Bonds: A social impact bond (SIB) is a financial tool that is used to provide up-front capital for contracting arrangements in which payment for service delivery is linked to the achievement of measurable outcomes. The SIB shifts risk from service providers to private investors (both commercial and philanthropic) and ensures that back-end payers, such as governments, pay only for projects that achieve their intended outcomes.[109] The SIB has been widely discussed since its 2010 launch, but the complexity of effectively deploying one is often overlooked. Using funding from the White House, the Social Innovation Fund (SIF) has recently made significant efforts to reduce the initial hurdles associated with the use of SIBs. SIF is funding fifty-eight social impact bond feasibility studies and is working to support the development of the backbone agreements for projects employing SIBs.[110] These studies have been critical to the growth of SIB deals and its expansion to cities and states across the country.

Prizes and Challenges: Prize-induced contests and challenges are often based on Joy's law: "No matter who you are, most of the smartest people work for someone else."[111] These competitions bring together individuals, communities, government entities, businesses, and nonprofit organizations to work on a discrete set of challenges to achieve a set goal over a specific time period. Cash prizes or other incentives can be offered to engage new people in public problem solving.

The Obama administration, through the White House Office of Social Innovation and Civic Participation (SICP) and the Office of Science and Technology Policy (OSTP), has worked with federal agencies to identify issue areas where prizes and challenges can address a range of issues including pay for success and increasing cost-effectiveness to maximize the return on taxpayer dollars.[112] The federal government also operates Challenge.gov, which is run out of GSA, and provides an official list of all federal challenges on an interactive platform. As of October 2015, more than 450 challenges have been posted online, with rewards totaling $150 million.[113]

For additional examples, see Appendix B: Government Innovation Program Examples.

Innovation Offices Within Government

As mentioned in the previous section, there are a variety of types of innovation offices within government. For example, USDS, 18F, and agency-based digital service teams have been leading the application of digital tools to improve service delivery within the federal government. Also, innovation labs with varying missions have been created throughout the federal government, often supported by the White House Office of Science and Technology Policy. Similarly, there are many city-based innovation teams, some known as i-teams, and many are supported by Bloomberg Philanthropies. According to Nesta, the UK innovation foundation, there are six key characteristics of i-teams: leadership, team, methods, resources, partnerships, and impact measurement.[114] Each city-level i-team prioritizes its own combination of these features to drive results; from that, a template of lessons learned has emerged and could be applied to structure innovation in the federal government.[115] The federal government has recently published some of its own lessons learned.[116]

Innovation Program Examples

US Global Development Lab: Launched in 2014, the Lab is a new entity in USAID that seeks to increase the application of science, technology, innovation, and partnerships to extend USAID's efforts to end extreme poverty. Its focus areas include food security and nutrition modernizing food assistance; preventable child and maternal deaths; energy access; water solutions: child literacy; financial inclusion; human rights, participation, and accountability; and humanitarian response. The Lab is headed by Ann Mei Chang,[117] who holds the titles of chief innovation officer and executive director.

Social and Behavioral Sciences Team (SBST): Established as the Social and Behavioral Insights Team in 2015, SBST[118] brings together behavioral scientists and innovators from across the country.[119] It is organized under the National Science and Technology Council and receives support from GSA's Office of Evaluation Sciences.[120] The team received a dedicated stream of funding and support from the White House Office of Science and Technology Policy. SBST tackles a range of issues by leveraging behavioral insights, including microloans for farmers, developing a reentry handbook with the Bureau of Prisons to reduce recidivism, and an income-driven repayment program.[121] Along each issue set, SBST identifies how behavioral insights could be leveraged to improve policy outcomes.

Lab@OPM: The Lab was created by OPM in 2012 to assist federal agencies in developing innovative solutions to complex problems. Under the direction of Stephanie Wade, it works directly with agencies to leverage human-centered agile design to develop products that "put the American people first." The Lab tries to identify the root causes of public-sector challenges and develops innovative solutions. For example, it recently tackled a complex policy problem by exploring solutions for how the Food and Nutrition Service at the Department of Agriculture can make it easier for families to provide accurate information about their eligibility for free and reduced lunch.[122] To address this question, the Lab@OPM reviewed the rules of the current food lunch program, interviewed the parties most affected (school officials and families), brainstormed solutions, and redesigned the application. The Lab has also tackled the question of how to improve the cumbersome interface of USAJobs.gov, which includes qualitative user interviews with both human resource specialists and job applicants.

For additional examples, see Appendices B and C.

Toward Assessing Impact: A Government-Wide Inventory and Assessment

Metrics for assessment can be difficult.[123] Even a major change to policy can take decades to assess. Innovation labs by their very nature may generate insight from human-centered design or alter the types of policies and products offered, and this can create even further obstacles to identifying and analyzing new outcomes against past results.

To effectively understand the impact of these innovation units, a bipartisan commission could be convened to assess the efforts that are taking place across the federal government, from USDS and 18F to innovation labs and fellowships in agencies. By way of context, a federal government commission conducted several rounds of a Base Realignment and Closure (BRAC), mostly in the post–Cold War period. Through an open, transparent, and comprehensive process, BRAC's nonpartisan commission was able to undertake an independent review and make suggestions. Proposing this type of audit is a tactic, previously used for government reform, which takes the decision making out of the political arena.[124]

A commission to evaluate technology, innovation, and data throughout the government would analyze many aspects of this ecosystem, some of which are outside this report's scope. For example, such a commission could also assess IT spending and procurement in the federal government and analyze the various avenues for innovation in government, including integrating technology, policy decision making, processes, people, and organization. The focus would be on innovation to transform how government works, instead of simply looking at changes in organizational cultures.

Assessing innovation across government will require analyzing how agencies can more effectively work toward institutionalization, including creating "virtual agencies" that work across programs to enable better coordination without a formal reorganization. Through this work, the commission could also review obstacles to citizen participation (e.g., Paperwork Reduction Act, Federal Advisory Committee Act) and consolidate funding and regulation to ensure that there are consistent expectations and outcomes. Such a bipartisan commission or task force would need at least six months to make a holistic assessment and provide recommendations to Congress.

Part of the commission's findings will affect the resource and funding allocation for innovation across the US government. Any type of innovation unit needs sustained resources to move from pilot projects to institutionalized processes. In addition to innovation offices within government to seed change, the federal government needs people and agencies that are able to address crosscutting issues. The Departments of Education, Labor, and Transportation, for example, have many intersecting issues that require collaborative, interagency policy to be effectively addressed. However, no structural resources (e.g., funding, reporting structures, and so on.) are available today that could enable this type of collaboration. This could mean trying new approaches such as incorporating online components. For example, the US Department of Commerce launched an expert network of "digital attaché" programs in eight key markets, including Brazil, China, Japan, India, and the European Union,[125] which instantly expanded Commerce's capacity to address e-commerce barriers and growth.[126]

3

CITIES AS INCUBATORS OF INNOVATION

Recommendations

Cities have been at the core of innovation in the United States and around the world. Many cities are emerging as thriving ecosystems to test various models of innovation. This includes incubating new processes and ideas, opening up data, and experimenting with new positions to enhance innovation, data, civic engagement, and resiliency. Many of these initiatives are gaining resources and traction internally, while combining catalytic dollars from foundations, especially in the US. The following recommendations are based on a variety of domestic cities. Much further research and analysis are needed to assess impact and generate scalable learning.

STRUCTURE

Access to Mayor: To successfully test, iterate, and scale ideas, innovation teams need high-level support, dialogue, and access to the mayor and senior leadership. This allows innovation teams to work on priority issues for the mayor and have high-profile visibility for their work. High-level leadership, at any level of government, can help provide the necessary political air cover for the implicit risks of innovating and helps to seamlessly incorporate innovation into overall policy and strategic deployment.

Provide Centralized Support for Successful Mechanisms: Innovative mechanisms, such as participatory budgeting, have gained traction in cities around the world. For example, the success of the participatory budgeting efforts in New York City drew the support of the City Council. The City Council's Speaker has even provided support staff to move this effort forward. Creating opportunities for centralized funding and support can help pilot projects become more deeply embedded into governance structures.

POLICY

Think Beyond Data and Apps: Innovation is not limited to the tools and approaches outlined in this report. By design, innovation should include combinations of new processes, tools, and approaches. Each new idea should undergo a needs assessment that is measured for impact, and not simply the merit of the idea divorced from potential outcomes. For example, New York City revamped pay phones to provide free, fast, reliable Wi-Fi and to serve as information hubs, and Boston's City Hall to Go leveraged a refurbished truck to deliver government services, but metrics for gauging the impact of these types of programs are still being identified. To generate these types of policy proposals, thinking should not be limited to data, apps, or legacy software.

Integrate Technology Early (and Often) Into Policy Deployment: Chief technology officers, innovation teams and digital officers should be integrated early into policy discussions. Early integration ensures that the appropriate technologies, approaches, and tools are considered as part of a policy rollout. This should be done in tandem with product development. Having a process that is structured can ensure that technology is considered from the *onset* of a policy conversation.

Support Cities as Innovation Districts: Multisector actors should be leveraged to create open civic spaces, such as Superpublic in San Francisco, Startup Seattle, or Civic Hall in New York City. These types of spaces can bring civic innovators, entrepreneurs, technologists, and philanthropy together to *collaboratively* find solutions for the public good.

PEOPLE

Engage the Community: Projects that empower community residents to articulate *their* own needs are more likely to empower community residents and to offer the government services and policies needed by citizens. Several cities across the country have open data communities and participatory practices that are working to engage community stakeholders.

Change the Narrative of City Government Work—Government Is an Exciting Place to Work: Taking the time to change the narrative of public service can foster trust for new approaches and can illustrate the many exciting opportunities within city hall. City government can become the focal point of interesting and important work. This includes finding ways to engage the public regarding changes and creating new channels for communication.

Analysis

Establishing innovation units and districts within government to engage citizens and external stakeholders is not limited to the federal government.[127] Cities around the United States are leveraging innovation tools and methodologies to make government more responsive to the needs of citizens, often empowered with technology and data. Some cities are empowering their CTOs while others are creating innovation units to both enhance internal governance and to structure external engagements through a variety of models and approaches. Large public-private partnerships, including investments from philanthropy and civil society, have helped to empower cities.

In many cases, city government has become the locus of innovation, leveraging data, technology, social impact bonds, and other tools. For example, the nonprofit organization Code for America has been placing technology-savvy fellows across local government to add knowledge and capacity to address public challenges. Fellows work directly with local government to "develop digital tools that help cities and counties delivery key public services across health, economic development, safety and justice, and communications and engagement."[128]

Cross-sector actors are investing in cities to generate experimentation, new policy models, and sharable lessons of best practices. For example, Bloomberg Philanthropies, working with the UK's innovation foundation, Nesta, has worked to spur, support, and elevate innovation teams (i-teams) across the globe.[129] These innovation teams leverage the innovation service delivery method, which is influenced by the

UK and its digital service teams. Bloomberg selected twelve US cities to participate in the $45 million expansion: Albuquerque, NM; Boston, MA; Centennial, CO; Jersey City, NJ; Long Beach, CA; Los Angeles, CA; Mobile, AL; Minneapolis, MN; Peoria, IL; Rochester, NY; Seattle, WA; and Syracuse, NY.[130]

Additionally, Bloomberg launched the Mayor's Challenge, which enables cities to generate "bold and new ideas that solve urban challenges and improve city life—and have the potential to spread."[131] The What Works Cities initiative, a partnership led by Bloomberg Philanthropies with Results for America, the Harvard Kennedy School, John Hopkins University, the UK's Behavioural Insights Team, and the Sunlight Foundation, aims to leverage cities' use of data and evidence to improve citizens' lives.[132] The Knight Foundation, Rockefeller Foundation's 100 Resilient Cities, the Kellogg Foundation, and other philanthropic foundations have also been looking at creative solutions to enhance cities.

The Knight Foundation's Cities Challenge rewards creative solutions for urban governance.[133] One of the winners of this challenge is the Pop-Up Pool Project in Philadelphia, which brings people from across economic divides together by turning underutilized community swimming pools into more welcoming environments as multipurpose civic spaces.[134] Among Knight's News Challenge has been a focus on rethinking libraries to address how they might serve twenty-first-century information needs. One winning project includes a project focused on storytelling in rural America and library-based video visitation for children of incarcerated parents.[135] The Rockefeller Foundation's 100 Resilient Cities initiative equips cities with resources, personnel, and learning opportunities for evolving physical, social, and economic changes. This includes hiring chief resiliency officers and working toward just and equitable cities.[136] The Kellogg Foundation is supporting Living Cities' National Community Development Initiative and building a community leadership network; an example is improving education and food systems in Detroit.[137]

Many other initiatives—metro labs and smart cities initiatives—are collaborative efforts.[138] The MetroLab network includes thirty four cities, three counties and forty four universities organized as city-university partnerships.[139] These partnerships work on research, development, and project deployment offering technological and analytically based solutions to challenges in urban areas. The federal government and corporations are also actively participating in these types of initiatives. For instance, Sidewalk Labs, a division of Google's Alphabet, Microsoft's Civic Innovation teams, and IBM's Smarter Cities.[140]

Across city governments new offices and new titles have been created. For example, several cities now have a chief technology officer, chief digital officer, chief data officer, chief innovation officer, and director of innovation. Innovation teams are springing up from San Diego to New Orleans.[141] Localities are experimenting with different models such as Rhode Island's Innovative Policy Lab and the Policy Innovation Lab at the University of Utah.[142] Volunteer citizen brigades supported by Code for America are creating thriving open data communities across the country from Austin to Oakland.[143] Much further research and analysis needs to be done on the impact of these types of initiatives and programs as well as how these new positions are translating private-sector roles and titles to public-sector positions and responsibilities. It is important to understand the responsibilities and contours of these new roles and titles, because without a clear description they can become conflated in practice. To have impact, the people holding these positions need to have the authority to make change.

According to Stephen Goldsmith, the Director of the Innovations in American Government Program at the Harvard Kennedy School, innovation offices need the imprimatur of the governor or mayor to challenge the status quo up and down the bureaucratic ranks—even if it means stepping on some toes.[144] Further research is necessary to establish metrics to determine the impact of new urban initiatives and their leadership.

These questions are relevant for both the federal and local governments. In fall 2016, San Francisco will open Superpublic, where federal, state, and city governments can work together with academia and private industry. This first-of-its-kind innovation lab creates a space to bring together the public, private, and nonprofit sectors to tackle public problems.[145] New York City's Civic Hall is a community center for civic tech innovators sponsored by industry and philanthropy.[146] Boston's District Hall is a collaborative civic space funded by a public-private partnership.[147]

The Center for Civic Innovation in Atlanta is a community-driven research and development lab for local government, nonprofits, and the business community with support from foundation and local businesses.[148] These types of interdisciplinary civic spaces and co-working hubs are cropping up across the country from Seattle to Austin to Washington, DC, attracting new talent and people interested in solving local problems.[149]

Participatory Budgeting in New York City

Participatory budgeting (PB) started in 1989 in Brazil, where it has led to increases in civil society organizations and spending for health care, and decreases in infant mortality rates.[150] In the United States, participatory budgeting started in Chicago in 2009, and since then, with political support from the White House, has expanded rapidly with more than $50 million in local-based public funds allocated.

In New York City, the Participatory Budgeting Project has worked closely with Community Voices Heard, a local membership-based organization that focuses on public housing for women of color and low-income families, to support and expand the process. In 2011, New York City launched the largest domestic project with bipartisan support and four City Council members implementing PB. Since then, the process has grown, with more than half of the City Council members (twenty-seven of fifty-one) implementing PB for 2015-16. One of the first to get involved, Melissa Mark-Viverito, was shortly thereafter elected Speaker of the City Council. This high-level support has enabled the participatory budgeting movement in New York City to have a more centralized and streamlined process, including with dedicated staff and access to resources.

New York City's PB has been effective at actively engaging previously marginalized residents in civic life. In 2014-15, 51,000 residents voted for projects using participatory budgeting; the majority (57 percent) identified as people of color, compared with 47 percent of local election voters and 66 percent of the total population of the twenty-four participating districts.[151]

In the 2015 PB vote, New York City, in partnership with Stanford University's Crowdsourced Democracy Team and Democracy 2.1, tested alternative ways of voting with the goal of making voting on projects "as easy as an ATM."[152]

Hence, New York City is experimenting with digital ballots using iPads for mobile kiosks and computers for in-person voting on projects. In 2016, New York City conducted the first-ever remote online voting with an integrated online/offline ballot. Researchers from universities across the world are partnering with Public Agenda, a New York-based nonprofit, and the Participatory Budgeting Project to conduct research on the process and its impact.[153] The PB process is pushing New York City toward more innovation use of technology to empower citizenry, including launching a Council Labs portal with geo-coded public information.[154]

Participating budgeting is an inclusive process not limited to registered voters—non-citizens and people as young as sixteen are eligible to participate. As New York continues to learn and refine, it is conducting targeted outreach to reach more excluded communities—low-income, African Americans, and Latinos—to actively engage in the process. Digitally enhanced PB offers further pathways to reduce barriers to entry and engage new people to participate in governance. Citizens can rank preferences, craft budget proposals, and vote—providing numerous opportunities to foster more just and inclusive governance processes. There is much to be learned from New York City's experience, both locally and globally.

New York City: LinkNYC

LinkNYC is a model for turning New York City's pay phones into communications hubs. Each Link has free high-speed Wi-Fi and can place phone calls, and each is equipped with a tablet for web browsing and ports to charge electronic devices. Supported by advertising, the project is at no cost to the public and offers gigabit internet speed, which is about one hundred times faster than typical public Wi-Fi. Link is rolling out in Beta phase to enable New Yorkers to provide feedback and comments. Through public-private partnerships, LinkNYC is also creating its revenue model testing advertising, sponsorships, and partnerships.[155]

Boston: New Urban Mechanics

Civic technology (civic tech) can create interfaces for citizens to offer input into decision making. Beyond simply enabling citizens to comment, civic tech is providing structured settings for people to make choices to actively govern their society. Prior to launching the New Urban Mechanics office in Boston, its co-founders leaped onto the momentum and distribution of smartphones to develop a cutting-edge application called *Citizens Connect* in 2009.[156] The app, now known as *Commonwealth Connect*, is used throughout Massachusetts. It creates a streamlined process for residents to report local issues directly to the right municipal agency and to work together to solve them. It empowers residents to improve the condition of their neighborhoods and has been used by more than 70,000 residents across multiple platforms, including a web-based interface and Android. The app now accounts for one-fifth of all city service requests, roughly 10,000 per year. Unlike processes to simply modernize government, it enables direct two-way communication between city residents and government employees.[157] Since Boston's current mayor took office in 2014, MONUM (short for the Mayor's Office of New Urban Mechanics) has moved from a pilot initiative to being a more embedded and institutionalized office within the government.

From the start, MONUM has focused on more than just modernizing performance management—its aim is to foster civic engagement. Today, MONUM is using its expertise in civic engagement to address other policy areas for City Hall. This includes enabling Boston to be a premier digital school district by 2020; increasing access to city services, specifically City Hall to Go,[158] which delivers services directly to the people; and running a Housing Innovation Lab committed to attracting small businesses and retaining affordable housing.[159]

With MONUM, residents have greater transparency into Boston's city planning decisions that affect political and subsequent policy decisions. By serving as a "risk aggregator," according to one staffer, and absorbing risk from other city agencies, MONUM enables city officials to operate in a more experimental, responsive, and participatory capacity. The support of the mayor has been critical to MONUM's success as it is developing tools and approaches to meet mayoral priorities.

Chicago: OpenGrid

To increase the effectiveness of its vast open data platform, Chicago created OpenGrid to provide an open source, situational awareness system to give residents access to a centralized repository of public information.[160] OpenGrid is one of the most advanced deployments of government data to empower citizens.[161] The map-based application was made by Chicago's Department of Innovation and Technology (DoIT) to provide intuitive visuals so residents could understand complex municipal data and use that understanding to interact with their community. For example, prospective entrepreneurs can go to OpenGrid to identify nearby permits and licenses. Residents, researchers, or community organizations can understand the pulse of the city by scouring data ranging from crime reports and environmental inspections to 311 calls for nonemergency city services.

OpenGrid is operated in collaboration with many organizations across Chicago. The city is partnering with the University of Chicago's Urban Center for Computation and Data and the Smart Chicago collaborative, which is composed of other local organizations including the MacArthur Foundation and the Chicago Community Trust.[162] They see the residents and businesses in Chicago as their clients. According to CIO and DoIT Commissioner Brenna Berman, "We're driven by what they need, and how we can serve them."[163]

What makes OpenGrid different? Previously, data were simply released without an engagement strategy, while OpenGrid is designed for participation, collaboration, and replicability. To understand how residents can most benefit from the information, OpenGrid is engaging residents from across the city who test civic websites and apps as part of Chicago's Civic User Testing Group and then provide direct feedback.[164] The coding and user documentation is publicly available on the file-sharing site GitHub. In theory, other cities can leverage the code for their own databases. Chicago has implemented effective open data policy by strategically engaging multi-stakeholder partners in the community. By taking this community-centric approach, Chicago has unleashed a more effective data program.

4

RECRUITMENT, HIRING, & TRAINING

Recommendations

A change in culture requires the ability to attract the right personnel. Recruiting and retaining the best and brightest talent in government will require some fundamental changes. This means creating easier ways to bring in external talent, retain internal talent, and demonstrate a willingness to invest in training civil and foreign service officers for the skillsets necessary to create a twenty-first-century government.

The hiring process needs to be quicker and more transparent. It also requires a more sustainable pipeline of inclusive talent; recruiting along traditional indicators of diversity, such as socioeconomic status, race, ethnicity, gender, and education levels, as well as a diversity of skillsets, expertise and background. Outreach done with intentionality to traditionally marginalized communities can ensure more inclusive on-ramps to government work to help build the federal workforce of tomorrow.

STRUCTURE

Accelerate Federal Hiring Timeline: The time between submitting an employment application to the federal government and being hired can take months. Also, the hiring process can be laborious for the hiring managers and frustrating for both the applicants and the team that has an opening. Furthermore, if security clearance is required, new hires can spend up to a year waiting for clearance approval before beginning their job. While there are inflexible realities of security clearance and hiring requirements for government work, removing entrenched inefficiencies is possible. Expanding the availability flexible hiring structures can improve hiring efficiency and put people to work sooner. For example, by utilizing Schedule A hires, the Intergovernmental Personnel Act, expert or consultant appointments,

term appointments, and the like,[165] much-needed human capital can be engaged in government work more quickly and, in some cases, without the restrictive requirements of career positions.[166]

Adopt More Flexible Hiring, and Rotations: The federal government can offer more flexible hiring and rotation options to expose employees to a variety of training, leadership development, and policy opportunities. This may include allowing personnel to complete a stint in a different department within an agency, work in a different part of the federal government, or even work at an external partner such as a university or private company. Also, flexible hiring and rotation options will enable field experts to move in and out of government with greater ease and with clearer structural supports. External talent can infuse government teams with cutting-edge practices and ideas while simultaneously exposing other sector leaders to the benefits and distinct impact of public-sector service.

Create Inclusive Talent Pipeline: The government should rethink the reliance on unpaid internships and recruiting methods. For example, community colleges and vocational training facilities could partner with philanthropies and technology companies to fund and populate a talent pipeline into the federal workforce. Also, working directly with community-based organizations, foundations, and community colleges could bring traditionally underrepresented groups into government.

POLICY

Communicate the Impact of Government Work: One obstacle to federal recruitment is the pervasive negative narrative about working in government. A new narrative needs to be communicated about the truly exciting and innovative leadership and career opportunities within the US government. Competition is fierce—tech firms, nongovernmental organizations, and other actors in the social sector often put their vision and appealing benefits at the forefront of their recruitment strategy. The federal government needs to more effectively communicate the impact of working in the US government, including on digital and social media channels. By telling their story and inspiring applicants through shared values, agencies can bring new voices into government and can motivate younger workers to see the government as an impactful place to work.

Bureaucracy Hackers: When external experts come into the federal government, they should be coupled with someone who already knows how the bureaucracy works and how to effectively navigate institutional structures (aka "bureaucracy hackers"). This could entail creating a "buddy system;" someone from outside of government is hired they would initially be paired with a civil servant, alternatively, create a support network within the agency office so that internal personnel who understand the bureaucracy are integrated into the activities and responsibilities of external experts. These partnerships could help bridge the gap from project to product management.

Engage Multisector Actors as Catalysts: Universities, industry, and philanthropy can all play a strategic role in recruiting new talent by providing funding, training opportunities, and working to develop a pipeline. This includes community colleges and is not limited to four-year degree granting programs. The government needs to ensure that inclusive talent from across the country can have opportunities to serve in government.

PEOPLE

Recruit Individuals with Critical Skills: The federal government would benefit from recruiting more individuals with skills in critical areas such as developing citizen-facing digital services, data science, cybersecurity, human-centered design, financial innovation, continuous process improvement, innovation management, and public-private partnerships. These are areas where there is often a large gap between the skills of world-class talent in the private sector and average public-sector performance. Identifying, recruiting, and successfully retaining these individuals will require: hiring or partnering with world-class recruiters; identifying compelling "mission statements" that these individuals would work on, as opposed to opaque and obsolete job descriptions; expanding the federal presence in major innovation hubs such as San Francisco and Austin for people who do not want to relocate; publicizing the accomplishments of innovators

who have served or are currently serving in the government; and ensuring top talent that their skills will be used to solve critical problems.

Incentivize More Inclusive Tech Talent: The public sector can strategically recruit more inclusive tech talent to reflect America's population. For instance, hiring and training programs situated in local communities, such as the White House's TechHire initiative, can combine federal funding and private sponsorship with community partners and local employees[167] to build stronger, more inclusive networks.

Recruit for Diverse Skillsets: Today's rapidly changing environment needs dynamic personnel. The government should hire people with diverse skillsets to work across silos, for example, attorneys with engineering backgrounds, data "nerds" with English degrees, community organizers with an understanding of the role of technology, ethnographers, programmers, and so on. The government needs dynamic staffers who may not fit into traditional silos or check-the-box hiring forms. Identifying and tapping into this type of human capital may require finding new talent pools for recruitment and reclassifying some existing job descriptions. This will also require updating job descriptions to ensure nomenclatures and job descriptions accurately reflect needed skillsets and experiences.

Train Current US Government Employees with Tomorrow's Skillset: Current government employees in the civil and foreign service should have access to training opportunities to develop the skills and critical thinking techniques necessary for tomorrow's workforce. Government can actively train personnel to understand and utilize new tools to better achieve impact. This could include understanding empathy and user-centered thinking; coding and design skills; and new financial models and public-private partnerships. Some universities offer training programs for federal employees, and some companies are investing in alternative training models. Individual agencies and employees should be empowered to determine precisely which skills are needed; this can range from technology policy, to language skills, to ethnographic research. Agencies also need to prioritize allocating resources for long-term gains. Obama's Strategy for American Innovation[168] has identified dozens of approaches to fostering innovation, such as incentive prizes, crowdsourcing, flexible procurement authorities to partner with commercial firms and start-ups, and evidence-based grant-making. Currently, many federal employees do not know that these approaches exist or they lack the training and support needed to use them effectively.

Analysis

Driving culture change requires attracting and retaining the right personnel. The government needs a strategy to bring external leaders into the federal government as well as the ability to provide opportunities for current personnel to diversify their expertise by gaining experience in other sectors. The federal government can bring in new talent and inspire internal talent by creating substantive incentives to innovate—from allocating bonuses to innovators, to implementing the ideas, to simply recognizing and giving profile to innovative thinkers. Also, the government needs people who have both the "mindset" and skillset to not only work with multiple groups across-silos, but also manage change in complex systems. This means creating easier mechanisms to bring in external talent and retain internal talent, coupled with a willingness to invest in training civil and foreign service officers for the skillsets of tomorrow.

Getting the best and brightest talent into government requires some fundamental changes. For starters, the hiring process needs to be quicker and more transparent. Government also needs a more sustainable pipeline of inclusive talent—this means recruiting both along traditional indicators of diversity, such as socioeconomic status, race, ethnicity, gender, and education levels, as well as from diverse skillsets, expertise, and backgrounds. Intentional outreach to traditionally marginalized communities (e.g., rethinking reliance on unpaid internships) can ensure the establishment of inclusive on-ramps into government work.

Innovation in government requires working across silos, and new recruits need to have dynamic backgrounds or dual competencies to effectively

navigate the digital economy of the future. Such dynamic recruits can have expertise that bridges fluency in policy, law, coding, programming, ethnography, finance, math, sociology, design thinking, community organizing, anthropology, business, and so on—a combination of expertise from typical and atypical fields can catalyze solutions to address the unprecedented challenges of twenty-first-century governance. As Beth Simone Noveck and Stefaan Verhulst note in "Encouraging and Sustaining Innovation in Government," "More people need to be trained in human-centered design, gamification, data science, data visualization, crowdsourcing and other new ways of working, and more people with those skills need to be brought into government."[169] Furthermore, the federal government could offer certificate programs, structured rotations, leadership training, and other skill-building opportunities to help current staff expand their abilities, and to apply data, technology, public-private partnerships, capital, and other tools of innovation.

Tomorrow's workforce must understand not only the opportunities that data and technology can provide to improve outcomes, but also the importance of asking the right questions from the onset to avoid unintended consequences such as discrimination. For instance, understanding how biases in algorithmic decision making can amplify existing inequalities, the basic architecture of the Internet, new financing models, and how outcomes-oriented public-private partnerships can serve business and society.

Talent alone is not enough to spur innovation; personnel also need the support of senior leadership. Our interviews consistently showed that a majority of innovation successes were achieved because of direct support from senior leadership. Support from senior political leadership provides the urgency to prioritize that work, the political air cover to take risks, and it encourages participation in innovation. In addition to leadership, sustained innovation needs a system of incentives to reward and retain talent. While money is a resource for incentivizing innovation (i.e., bonuses for innovators), funding is too limited in current budgets. Government can also provide other incentives: giving recognition for the creativity and innovation of individuals and teams; offering opportunities for further leadership development and growth; and providing opportunities for individuals and teams to work on high-profile projects. Finally, government can change the narrative by effectively communicating all the important work it accomplishes each and every day.

Political Appointees: The next administration can decide: What types of political appointees are we trying to attract? What are the key skills sets? How do these political appointments help prioritize an innovation agenda?

Attracting External Talent: Each new administration has the opportunity to attract new talent to work in government. There are several ways to go about this:

Fellowships and Rotations

The government needs to create fellowships to attract talent for finite periods of time. A temporary tour of duty in the federal government is an important and underutilized "third path."[170] Bringing in "doers" who can work on time-bound solutions is key because it: avoids the long and arduous process of vetting and confirming candidates for presidentially appointed or Senate-confirmed positions; brings in key experts for time-bound projects; and attracts candidates who want to do public service but are not necessarily able to make a twenty-year commitment as a civil servant. These skills are critical, particularly in areas where the gap between the state-of-practice in the federal government and the private sector is vast. Ares where these skills are needed could include: data analytics and data-driven decision making; human-centered design; building consumer-facing online services using "agile" methodologies; rapid experimentation using A/B testing; "lean start-up" approaches to prototype new solutions; financial model innovation; and world-class project management.[171]

The federal government already has a number of rotation options available for personnel at various stages in their careers. The most prominent of these is the longstanding Presidential Management Fellows (PMF) program, which tackles some of the issues with attracting early career recruits to public service. PMF is more than just a finite fellowship; it aims to keep participants in the civil service after the completion of their fellowship. However, while the program used to

recruit and retain young talent, it has been struggling over the past few years.

According to a 2014 survey, one third of PMFs surveyed reported not being satisfied with their agency, yet retention rates appear to be remarkably high.[172] There are other programs focused on long-term recruitment of young professionals. For example, the Environmental Protection Agency's STAR and GRO fellowships[173] offer funding for undergraduate or graduate research that is consistent with the agency's work. Also, the federal government has developed the Pathways Internship Program over the past four years to attract recent graduates into the federal workforce.[174]

Other agencies have fellowships designed to rotate an early or mid-career professional through a government entity, with the intention that the fellows will graduate and return to their sector. One such example is the recently created Presidential Innovation Fellows (PIF) program, which seeks to bring accomplished talent in the data and tech sector into the federal workforce for a year. PIF offers a twelve-month rotation to expose fellows to public service and vice versa, and at the end of the fellowship they are expected to return to their respective sectors. Further data are necessary to understand the impact of the PIF experience and where fellows have gone after their time in government. Also, the American Association for the Advancement of Science has partnered with many science-focused agencies and departments to develop the Engaging Scientists and Engineers in Policy program, which offers myriad fellowships to young and mid-career scientists to engage them in public service.[175] Ensuring the success of these fellowships requires a commitment by agencies and staff to want to change the culture internally and to effectively leverage external partners.

The government can also work with other sectors through public-private partnerships. Hiring can tap into existing networks and collaborative funding structures, including philanthropic models such as Net Gain, a collaborative of foundations including MacArthur, Mozilla, Ford, Open Society, and Knight,[176] or work with community-based organizations such as the Smart Chicago collaborative.

Industry, the social sector, and universities can all create structures, pathways, and rotations where people can gain valuable government experience. Another fellowship example is Harvard Business School's Leadership Fellows program. During the fellowship year, a graduating student from the business school is placed on a team within the nonprofit or public sectors to bring in new ideas and a new skillset.[177] The aim of the program is twofold: first, by situating fellows within a governmental or nonprofit office, fellows infuse those offices with a new perspective or solutions, and by working directly with those teams the fellows build trust, which helps creates space to develop a culture of innovation; and second, by working within the public and nonprofit sectors, MBA graduates gain much-needed direct experience in social impact work.[178] Chris Osgood, co-founder of Boston's Mayor's Office of New Urban Mechanics, began his public service career on a Harvard Business School Leadership Fellowship creating performance management tools for Boston, and he then stayed on as a senior advisor to then Mayor Menino. Dan Koh, Mayor Walsh's chief of staff, also a HBS Leadership Fellow, stated, "The innovation Chris has injected into City Hall in his career has been incalculable."[179]

At the same time, the government needs to create incentives for civil service staff by offering rotations, opportunities for creative learning, and exposure to different sectors and agencies. The State Department's second Quadrennial Diplomacy and Development Review included a recommendation for how the Department of State could better invest in an "agile, skilled workforce." One recommendation was to allow workforce mobility, enabling employees to move between department bureaus, rotating between the State Department and USAID, being detailed to other federal agencies, or even taking sabbaticals from federal service into academia or the private sector.[180] As the State Department's Tom Perriello has said, "We're managing people's entire careers, not just managing them to the next tour."[181]

While these fellowships focus on different segments of the talent pool and have different outcome goals, all are high-profile programs that capitalize on people's enthusiasm for public service. The private sector has a

role here, too: private-sector companies should work with government to create pathways to service.

Companies, start-ups, and other firms should work in tandem with public-sector organizations to offer a "public service leave" similar to what is available for tenured faculty at public policy schools. For example, community colleges and vocational training facilities could partner with philanthropists and technology companies to create a more diverse talent pipeline. The government could even offer personnel a short-term, structured residency in a start-up or private-sector company; the personnel then could translate their lessons learned back to policymaking.

Recruiting People into Government

Although federal workforce recruitment experienced a spike in 2009 as a result of the American Recovery and Reinvestment Act, it has remained sluggish in the years since that initial surge. The federal workforce itself has record low morale[182] and is rapidly aging.[183] The average civil servant is older than the average civil servant was just a decade ago. More than a third of federal employees are eligible to retire. This is unprecedented. Furthermore, recent data show only 7.9 percent of the total federal workforce is under the age of thirty. In 2000, roughly 94,000 sixty-year-olds worked for the government. In 2013, there were 262,000. Government statistics show that the percentage of government employees under the age of thirty hit an eight-year low of 7 percent in 2013, compared with about 25 percent for the private-sector workforce. To put this into context, in 1975, more than 20 percent of the federal workforce was under the age of thirty.[184]

Federal hiring personnel should prioritize the aggressive recruitment of this missing generation of human capital by focusing on millennials. A first step would be to better communicate the impact that government has each and every day, including through social and digital channels.

Contrary to conventional wisdom, US Department of Education statistics show that more millennials are interested in careers in public service than past generations, and more bachelor's and particularly master's degrees have been awarded year over year in fields related to public service.[185] Some possible explanations for the gap between the drive toward public service and the proportion of millennials in the federal workforce include an increasing diversity of options in the social sector, depressed recruitment efforts, and a mismatch in benefits. Reworking benefits is an opportunity for easy gains; by increasing options in the healthcare plan structure or highlighting the underutilized existing student loan assistance program, federal employment will become competitive with other market sectors.

Currently, government recruitment is often a non-transparent, laborious, and time-intensive process. There is a limited structure for recruiting innovators; individuals often rely on their personal networks, which is problematic for scaling. Several agencies, such as 18F, have reduced the time to hire people from six months to six weeks. USAID's Global Development Lab has used Schedule A appointments to recruit top talent to address priority issues, such as poverty reduction. Agencies such as the Consumer Financial Protection Bureau and the Millennium Challenge Corporation have more hiring and human resources flexibility, because as newer agencies they lack accumulated and entrenched inefficiencies. Noveck and Verhulst's recommendation is to "change hiring practices to hire people for selected positions in one month or less."[186]

While the Office of Personnel Management has led reforms to revamp USAJobs.gov, the entire hiring process could be shortened and should integrate the very managers who are looking for new staff into the hiring process from the start. Also, this will also require updating job descriptions to ensure nomenclatures and job descriptions accurately reflect needed skillsets and experiences.

Toward a More Inclusive Workforce

Working toward a more inclusive federal government requires reducing some of the structural impediments. For mid-career adults who are interested in public service, one barrier is the structural advantage of career civil servants. When someone in mid-career applies for a federal job, that person is competing with workers who have spent their entire careers in

government, and job postings at that experience level tend to require previous public service experience. Potential avenues to leveling the playing field could include encouraging lifetime public servants to rotate to different agencies and creating application questions that translate relevant, external experience to address public service needs.

Meanwhile, for college students, unpaid internships can be a barrier for entry into public service. If the federal government wants to prioritize diversity in its younger workforce, hiring managers need to have funding streams to offer more paid internships. While simply offering a traditional wage would be ideal, internships are often unpaid because funds do not exist in the correct pot of money to pay the intern. In those cases, other funding structures could be utilized, including offering scholarships, creating stipends based on specific eligibility criteria, and structuring public-private partnership to infuse private-sector, university, or philanthropy funding for internships.

While subject matter expertise is undoubtedly one of the most crucial components in hiring, particularly at the leadership level, there should also be an effort to seek out individuals with diverse backgrounds and skillsets. Dual competencies when combined with policy expertise can help structure more inclusive, innovative, and creative teams. For example, hiring government teams comprised of policy experts as well as personnel with dynamic backgrounds including ethnography, sociology, community organizing, computer science, programming, service provision, or business.

Widening the tent of the skillsets prioritized for government can help form cross-sectional teams that can, in turn, slowly make government less risk-adverse and, eventually, stimulate a shift in government's culture. Some start-ups, innovative companies, and NGOs in the social sector are free from legacy bureaucracy and can outcompete the federal government in attracting talent. Concerted efforts to widen the skillsets deemed necessary for effective governance can help bridge this gap.

It is not enough to recruit more inclusive talent into the White House; a systemic US government-wide approach is necessary. While USDS, the White House, and 18F are enabling technology and private-sector talent to come into the federal government,[187] these high-level recruitment initiatives should complement (not substitute) building a scalable structure for a deep data and innovation talent pool across the entire US government.

Leadership

Institutionalizing innovation requires both "adaptive" and "pragmatic" public-sector leadership. Adaptive leadership first determines which public activities to maintain and which to adapt and transform. Pragmatic leadership transforms the culture of a public organization to enhance learning and leverages existing tools to transform established practices.[188] One measure of success may be outcomes metrics to translate adaptive and pragmatic leadership into improved policy outcomes.

Leaders must create the structural conditions under which new modes of thinking and creative problem solving are cultivated, encouraged, and rewarded. Bureaucratic leaders and those with the knowledge to "hack" the system can provide necessary political cover, resources, and institutional knowledge to bring about process change.

One aspect of leadership is creating the conditions of flexibility and career development already outlined. Another aspect is recognizing the existing structures that are ripe for improvement. For example, the Senior Executive Service could be reformed to optimize for innovative talent and leadership. These slots could go to people with dual competencies and tech skills.[189]

Similarly, the government's IT positions roles and responsibilities need to be rewritten to reflect today's changing needs. This job category, 2200, offers opportunities for critical roles but needs to reflect diversity and ensure it is not captured by corporate viewpoints or beholden to the revolving door.[190] Tom Steinberg, founder of mySociety, an international NGO that develops civic tools, has said that government tech is stuck in a "government-contractor complex where procurement, bureaucracy, politics, regulatory capture and election cycle make it hard."[191] The next administration can help break this cycle.

SUMMARY OF RECOMMENDATIONS

STRUCTURE

White House Option 1: Empower a Deputy Chief of Staff to Manage the Innovation Portfolio and Create Designated Deputy Assistant to the President in the Councils

Establish a deputy chief of staff (COS) position to manage the implementation of the federal government's innovation portfolio. The deputy COS would have a formalized role to act as the central coordinator of innovation priorities and activities, including the conversations led by current White House features (e.g., the Data and Digital Cabinets and the Technology Policy Task Force), and would serve as the White House's representative for the innovation agenda across agencies. The deputy COS would also work closely with key cross-agency groups and councils (e.g., National Economic Council (NEC), National Security Council (NSC), and Domestic Policy Council (DCP)) to ensure effective scaling of innovation across agency initiatives. In addition to this deputy COS position, create a deputy assistant to the president (DAP) within each council (e.g., NSC, NEC, DPC), and empower the CTO and other relevant positions (e.g., chief data scientist) at OSTP to integrate and prioritize innovation in agencies. The DAPs would liaise with their agencies as the point of contact for data, technology, business model innovations, and the like, as well as address legal, policy, or other barriers identified by agencies or communities. In addition to reporting to their council leadership, this new DAP should also report to the deputy COS. The DAPs would report to their council heads but would also have direct reporting authority to the deputy COS tasked with implementation and innovation at the White House. The deputy COS would both oversee the DAP's work and set priorities for the innovation agenda in conjunction with the federal CIO and the OMB deputy director of management.

White House Option 2: Create an Innovation, Data, Evidence, and Adaptability Council at the White House (Executive-Level Leadership)

Create an Innovation, Data, Evidence, and Adaptability (IDEA) Council in the Executive Office of the White House (at the level of the DPC, NEC, and NSC). The IDEA Council would coordinate innovation and data offices across government, set priorities to deliver results on the president's agenda, and work with the OMB management team and the federal CIO to help achieve the outcomes set with the White House. It would also house and oversee the various innovation offices and fellowship models that have recently developed to bring new thinking into the DNA of government. The IDEA Council would work in conjunction with a deputy chief of staff tasked with implementation and innovation.

White House Option 3: Strengthen Innovation Capacity in OMB's Management

Strengthen the management side of OMB by creating a direct reporting relationship with a deputy chief of staff. Empowering management in OMB to administer and motivate an innovation agenda would enable OMB to utilize its managerial and budgetary pull to coordinate, inspire, and enable innovative efforts across the federal government. This option requires clarifying and defining the roles and responsibilities of key officials, including those of the CTO and CIO, and addressing the question of external events and convenings, which have often been hosted by OSTP. OMB is largely an internal-facing agency, but to drive innovation it would need to be able to lead externally-oriented events and convenings.

Ensure Agency Leadership for Innovation Offices: Agency innovation offices should report to the secretary or deputy secretary. For innovation to be prioritized, either the secretary or deputy secretary needs to oversee innovation work. This would help create the appropriate incentives for personnel within agencies to be empowered to innovate on solutions. This structure would empower innovation within agencies, integrating with tech, acquisition, program, and other key stakeholder offices.

Oversight Commission: Within six months of taking office, the next administration should create a bipartisan commission to conduct an audit to analyze the various avenues for innovation in federal government, including law, policy, technology, processes, people, and organizational structure. It would provide recommendations to Congress about how to improve innovation throughout the government. Congress would need to be a partner for long-term change.

Adopt More Flexible Hiring and Rotations: The federal government can offer more flexible hiring and rotation options to expose employees to a variety of training, leadership development, and policy opportunities. This may include allowing personnel to complete a stint in a different department within an agency, work in a different part of the federal government, or even work at an external partner such as a university or private company. Also, flexible hiring and rotation options would enable field experts to move in and out of government with greater ease and with clearer structural supports. External talent can infuse government teams with cutting-edge practices and ideas while simultaneously exposing other sector leaders to the benefits and distinct impact of public-sector service.

Accelerate Federal Hiring Timeline: The time between submitting an employment application to the federal government and being hired can take months. Also, the hiring process can be laborious for the hiring managers and frustrating for both the applicants and the team that has an opening. Furthermore, if security clearance is required, new hires can spend up to a year waiting for clearance approval before beginning their job. While there are inflexible realities of security clearance and hiring requirements for government work, removing entrenched inefficiencies is possible. Expanding the availability flexible hiring structures can improve hiring efficiency and put people to work sooner. For example, by utilizing Schedule A hires, the Intergovernmental Personnel Act, expert or consultant appointments, term appointments, and the like,[192] much-needed human capital can be engaged in government work more quickly and, in some cases, without the restrictive requirements of career positions.[193]

POLICY

Adopt Flexible Procurement Policies: Modern, agile methods and policies increase the flexibility of government IT procurement processes by aligning the acquisition and budget processes with the technology cycle. Agile methods support the development of more modular IT development, prioritize the training of more IT acquisition professionals in government, provide numerous avenues for more efficient IT spending, bring innovation into the selection of contractors and oversight of contract execution, and require more cross-agency, collaborative, user-centered, and iterative IT procurement methods.

Take Innovation Sprints: The government should encourage "innovation sprints" with a specific agency, groups within an agency, and/or as a collaboration of agencies working on a problem together within a limited time frame. A few key problems could be addressed with radical experimentation to trigger change. This could include testing flexible hiring and procurement, or implementing new financing methods that create aligned incentives. Quick and agile sprints would use data and measure outcomes. The process, from identifying problems to developing solutions, would be fully transparent and accountable to the American public. Also, as a means for delivering solutions, if the most important issues were tackled as cross-government initiatives, an innovation sprint would create a sense of urgency and mission, thus enabling the sprint team to pull in the right expertise from across agencies and to leverage different authorities from each agency to quickly achieve an outcome.

Support Outcomes-Focused Funding: An outcomes fund should be created in partnership with the private sector and philanthropy. Such a fund would spur innovative solutions—financing mechanisms, programs, or method—with payments based on results. An outcomes fund would create a market for programs and policies that achieve outcomes. As outcomes are achieved, the pool of federal dollars dedicated to outcomes-focused programs and contracts should also be expanded. As capacity improves and models are proven, government should eventually base more mandatory funding on the achievement of outcomes. A fund would help policymakers gain more insight into what types of innovations—programs and policies—work and the appropriate methodologies that can best measure and evaluate their impact. Over time, government can then reallocate money from less effective models and policies to more effective ones. This will require congressional support. As returns on investment are demonstrated, the executive branch could work with Congress and the private sector (e.g., foundations) to expand the use of outcomes funds and innovative finance mechanisms such as pay for success.

Think Beyond Data and Apps: Innovation is not limited to the tools and approaches outlined in this report. By design, innovation should include combinations of new processes, tools, and approaches. Each new idea should undergo a needs assessment that is measured for impact, and not simply the merit of the idea divorced from potential outcomes. For example, New York City revamped pay phones to provide free, fast, reliable Wi-Fi and to serve as information hubs, and Boston's City Hall to Go leveraged a refurbished truck to deliver government services, but metrics for gauging the impact of these types of programs are still being identified. To generate these types of policy proposals, thinking should not be limited to data, apps, or legacy software.

Support Cities as Innovation Districts: Multisector actors should be leveraged to create open civic spaces, such as Superpublic in San Francisco, Startup Seattle, or Civic Hall in New York City. These types of spaces can bring civic innovators, entrepreneurs, technologists, and philanthropy together to *collaboratively* find solutions for the public good.

PEOPLE

Incentivize More Inclusive Tech Talent: The public sector can strategically recruit more inclusive tech talent to reflect America's population. For instance, hiring and training programs situated in local communities, such as the White House's TechHire initiative, can combine federal funding and private sponsorship with community partners and local employees[194] to build stronger, more inclusive networks.

Recruit for Diverse Skillsets: Today's rapidly changing environment needs dynamic personnel. The government should hire people with diverse skillsets to work across silos, for example, attorneys with engineering backgrounds, data "nerds" with English degrees, community organizers with an understanding of the role of technology, ethnographers, programmers, and so on. The government needs dynamic staffers who may not fit into traditional silos or check-the-box hiring forms. Identifying and tapping into this type of human capital may require finding new talent pools for recruitment and reclassifying some existing job descriptions. This would also require updating job descriptions to ensure nomenclatures and job descriptions accurately reflect needed skillsets and experiences.

Train Current US Government Employees with Tomorrow's Skillset: Current government employees in the civil and foreign service should have access to training opportunities to develop the skills and critical thinking techniques necessary for tomorrow's workforce. Government can actively train personnel to understand and utilize new tools to better achieve impact. This could include understanding empathy and user-centered thinking; coding and design skills; and new financial models and public-private partnerships. Some universities offer training programs for federal employees, and some companies are investing in alternative training models. Individual agencies and employees should be empowered to determine precisely which skills are needed; this can range from technology policy, to language skills, to ethnographic research.

Engage the Community: Projects that empower community residents to articulate *their* own needs are more likely to empower community residents and to offer the government services and policies needed by citizens. Several cities across the country have open data communities and participatory practices that are working to engage community stakeholders.

Appendix A

Great Moments of Innovation in Policymaking

Policy is a powerful tool for creating systemic change. The implementation of a single policy can solve for a myriad of issues when developed thoughtfully. For example, the Clean Air Act of 1970 did not just solve for asthma in LA County, rather by broadening the scope of application this policy ushered in a new era in environmental and public health management practices. To achieve social impact at scale, policymakers need to think about, fund, and evaluate social policies and programs in new, innovative ways.

Below please find an overview of four examples of great moments of innovation in policymaking in the United States: National Park Service; the War on Poverty and US Voting Rights Act; the Clean Air Act; and the National Weather Enterprise. These diverse and varied examples are provided not only to convey the magnitude of policy's impact, but also the relationship of policy to broader societal changes—the National Park Service would not have been possible without the rise of conservationist movement.

National Park Service, Est. 1916

"National parks are the best idea we ever had. Absolutely American, absolutely democratic, they reflect us at our best rather than our worst." — Wallace Stegner, 1983

"The National Park System and the work of the National Park Service...make it possible for all Americans—millions of them at first-hand—to enjoy unspoiled the great scenic places of the Nation." — Newton B. Drury, NPS Director, 1940-1951

In the late nineteenth century, a movement developed around the value of the 'natural' landscape of the United States—the landscapes of California and the Grand Canyon were seen as not just features of the 'wild west' but perceived as *national* treasures to be valued and preserved for generations to come. As a result of this movement, on March 1, 1872, President Ulysses S. Grant signed the Yellowstone National Park Protection Act, which created the world's first national park in Wyoming. President Theodore Roosevelt is remembered as one of the great champions of National Parks. He said, "Of all the questions which can come before this nation, short of the actual preservation of its existence in a great war, there is none which compares in importance with the great central task of leaving this land even a better land for our descendants than it is for us."[195] As popularity for tourism and conservation continued to grow, so too did a need to administer these parks.

By 1916, President Woodrow Wilson signed the act creating the National Park Service, a new federal bureau in the Department of the Interior. The National Park system in the United States started a *global* movement that linked the preservation and protection of a landscape's natural state to the very identity and core values of a nation. Today, land from Patagonia to the mountains of Pakistan, Canada's Yukon territory[196] to the southern tip of New Zealand, are protected because a shift in value occurred. NPS is a compelling example of innovation, because sometimes the creation of a new agency or office not only reflects a domestic social or political change, but can also spur a global shift in practice.

War on Poverty (1964) & US Voting Rights Act (1965)

With his declaration of war on poverty in January 1964, President Lyndon B. Johnson ushered in an era of transformative policymaking in the United States. At a time of incredible national tension, the eradication of poverty became the ultimate resolution of the crippling inequality rife across the United States. "The term "war on poverty" generally refers to a set of initiatives proposed by Johnson's administration, passed by Congress, and implemented by his Cabinet agencies."[197]

President Johnson's declaration resulted in four major pieces of legislation: the Social Security Amendments of 1965 creating, among other things, Medicare and Medicaid; the Food Stamp Act of 1964; the Economic Opportunity Act of 1964; and the Elementary and Secondary Education Act (reauthorized in 2002 as the No Child Left Behind Act). To further situate this: Martin Luther King Jr. marched on Washington in 1963, and the Civil Rights Act was signed in 1964. Johnson's focus on the *outcome* of various social, economic, and political factors spurred an era of change—change that micro-level policies would never have addressed. The merits, successes, and challenges of each of the resulting initiatives, the *approach* and scale that Johnson's policy operated from strike at the core of this paper: to trigger change we need to focus on outcomes, on understanding and approaching cross-cutting issues and engaging across sectors to stimulate, innovative change.

Today, poverty is one third the rate of 1967, but a 2014 report by the White House, argues "Despite real progress in the War on Poverty, there is more work to do."[198] Moments of policy innovation, while noteworthy when they occur, run the risk of becoming time-bound and weakened by indifference—the establishment of groundbreaking policies also requires vigilance. Consider the US Voting Rights Act of 1965 this incredible accomplishment has dwindled into its current state where today we're faced with the consequences of a lack of vigilance. The US now have one of the lowest percentages of voter turnout globally, yet we are the paradigmatic 'democracy.'[199] Policy innovation requires agile thinkers who are willing to reach across silos to rethink and iterate new approaches, but without a commitment to the long-term, today's great solutions can transform into tomorrow's nightmare.

Clean Air Act of 1970

"Strict environmental regulations do not inevitably hinder competitive advantage against foreign rivals; indeed, they often enhance it." — The Porter Hypothesis, 1991[200]

The Clean Air Act of 1970 (CAA) and its subsequent amendments were passed to combat a variety of air pollution concerns and emerging pollution threats. "To protect public health and welfare nationwide, the Clean Air Act requires EPA to establish national ambient air quality standards for certain common and widespread pollutants based on the latest science."[201] The CAA was resisted by private industry over fear of exorbitant compliance fees, but upon implementation regulations actually had the ability to enhance competitiveness.[202] Think of Los Angeles twenty-five years ago, it looked like current day Beijing. In China today, coal-fired power plants are sending dust into Hong Kong, so think of how effective treating asthma or respiratory disorders in Hong Kong would be without the broader application of an effective policy. In 1878 the UK passed the Public Health Act to address concerns surrounding the unprecedented smog and pollution.

The implementation of a single policy can solve for a myriad of issues when developed for scalability. For example, with the implementation of the Clean Air Act in 1970 *many* problems situated across various issue areas, from industry regulation to public health, were addressed. The dynamic policies and regulations enacted by CAA to address public health and welfare risks moved beyond micro-level issues. Focusing on the broader outcomes of declining air quality, instead of launching an initiative to mitigate, say, increased asthma rates within LA County, or other public health issues individually, the Clean Air Act solved a multitude of issues by looking at the bigger picture. By instead focusing on the macro-level effects of, for example, smog, the CAA ushered in a new era of public health, industry, and environmental management.

President Bush - 1992 Regulatory Moratorium

In January 1992, President George H. W. Bush imposed a regulatory moratorium—a hold on all new regulations in the final year of his presidency. "Beginning with President Reagan, all US presidents other than George H.W. Bush have issued short-term regulatory moratoria immediately upon coming into office to facilitate review of midnight regulations passed by their predecessors. President Bush, who followed a member of his own party...instead implemented a one-year moratorium during his last year in office."[203]

In 'Regulatory Moratoria,' Professor Kathryn Watts differentiates between the harsh, unpractical application of 'hard' moratoria that are more long-term versus the utility of 'soft' moratoria as a means to assess and pivot policy during times of political transition.[204] The merits and intentions of President Bush's declaration for a regulatory moratorium aside, when considered at a higher level, particularly within the dynamic environment of contemporary digital technology, the ability to enact a regulatory pause or audit has its appeals. Again, separating this method from its political roots and applications in the US,[205] establishing a regulatory 'pause' at the start of a new administration can open a space to assess, identify and reconfigure outdated policy. This is not regulation for the sake of regulation, nor is it deregulation for its own sake—an assessment of inefficient, outdated policies would be a critical jump forward in the efforts to modernize government systems, from IT to human resources. This approach applies not only to a new administration but across the federal government—it could create a much needed space to empower personnel to ask 'what is outdated' and 'how can we do this better, faster, cheaper'?

With the rapid development of digital technology there is a need to pivot policy, to catch-up and assess current practices. Following previous attempts to assess the rules and procedures in government, agencies argued that they "lacked adequate budgets to both write new rules and to reconsider old ones";[206] assessing policy via a regulatory moratorium (or mere audit) requires the structural support to incentivize and enable agencies to better craft policy and practice.

National Weather Enterprise

Today, 'checking the weather' is as pedestrian as receiving daily mail deliveries, but the infrastructural foundations of monitoring the weather were made possible by government resources. The role of the federal government in the establishment of weather monitoring systems goes back to the days of Thomas Jefferson. In 1807, Jefferson created the Survey of the Coast, America's first physical science agency. By 1970 when the National Oceanic and Atmospheric Administration (NOAA) and the National Weather Service were created,[207] fire forecasts and hurricane alerts were a standard of expectation among the American public. "According to some estimates, about $3 trillion of the US economy is made up of weather-sensitive industries."[208]

The world's first operational weather satellite system was achieved with the 1966 launch of Environmental Science Services Administration (ESSA). For nearly four years, ESSA satellites transmitted thousands of images back to Earth, enabling ground station predictions of weather patterns, including hurricanes. In 1970, a series of consolidation and reorganization plans were enacted which created the National Weather Service, as well as establishing NOAA within the Department of Commerce along with various responsibilities previously directed by the Departments of Defense and Transportation. NOAA's operational weather satellite service—now environmental satellites because of their capabilities—continues today.[209]

Today, weather forecasting alone is a $6 billion industry to say nothing of the private enterprise enabled by the availability of this type of information.

Appendix B

Government Innovation Program Examples

A wide variety of innovation programs exist within the government, and while their individual successes have varied, there is an opportunity to enable a convergence across these piloted initiatives.

(The following list is strictly illustrative, it is neither comprehensive nor complete.)

Offices/Labs

US Digital Service: A digital consultation service within the federal government at OMB to help solve critical issues in government. USDS was created after the launch and recovery of healthcare.gov to serve as the federal government's technology solutions 'swat-team.' Current projects include: modernizing the immigration system, supporting the day to day efforts of Healthcare.gov, and expanding access to government information in consultation with 18F, including making the Federal Election Commission (FEC) databases more accessible via open APIs.

18F: a 'start-up' fee-for-service federal digital consultancy housed in GSA's Technology Transformation Service. 18F was created in 2014 following the launch and subsequent recovery of healthcare.gov. Recent projects include: Navy Reserve / Ready to Serve (R2S), the Department of Education's collegescorecard.ed.gov, and analytics.usa.gov.

Presidential Innovation Fellows: A twelve-month fellowship designed to bring innovators from the private, nonprofit and academic sectors together with the highest leadership in the federal government to tackle some of the US's biggest challenges. Projects include: Police Data Initiative, Human-Centered Design to support veterans, building and scaling 18F, VA Innovation Creation Series, Every Kid in a Park Initiative, and others.

Technology Transformation Service (TTS): Created in 2016, TTS houses the General Services Administration's digital services and innovation teams at 18F and the Office of Citizen Services and Innovative Technologies, the Social and Behavioral Sciences Team, as well as the Presidential Innovation Fellows (PIF) program. The creation of TTS established the third service arm of GSA; the other two service lines include the Federal Acquisition Service and the Public Buildings Service.

Office of Science & Technology Policy (OSTP): Established in 1976, OSTP is a White House Office that advises the President and the Executive Office on the role of science and technology in domestic and international affairs. OSTP's work spans across nine primary initiatives, one of which focuses on spurring innovation in the US and abroad. OSTP's innovation initiatives includes a variety of projects, programs, and activities, including investment in advanced manufacturing, implementation of grant challenges and incentive prizes, the identification and amplification of global development technologies, the commercialization of federally-funded research, the investment in research and development in robotics, and beyond.

Social Innovation Fund (SIF): Created in 2009 and housed in the Corporation for National and Community Service (CNCS), the Social Innovation Fund (SIF) directs public and private resources to community-based organizations with demonstrated results in the areas of economic opportunity, healthy futures, and youth development. SIF primarily provides annual grants of $1-$5 million to local grant making intermediaries and is structured to maximize funding for communities by requiring intermediaries and their non-profit implementing partners to match federal funds dollar-for-dollar. SIF also has a strong focus on results and provides both technical assistance and program evaluation funding to its various implementing partners.

NASA's Center of Excellence for Collaborative Innovation (CoECI): Established at the request of the White House Office of Science & Technology Policy, CoECI oversees the planning and execution of challenge-based initiatives designed to solve complex issues faced by NASA and other federal agencies. Previous CoECI challenges include requests for: the development of an algorithm to identify asteroids in images captured by telescopes (Asteroid Data Hunter), a portal to assist states in their Medicaid provider screening efforts (Medicaid Provider Portal Challenge), and equipment to improve the wellness of astronauts living in zero-gravity environments (Bio-Inspired Advanced Exercise Concepts).

Defense Innovation Unit Experimental (DIUx), Department of Defense: With offices on both coasts of the US, DIUx is a Department of Defense program that works to build bridges between the US military and American technology companies. Though still in its start-up phase, DIUx is structured around three operating teams: one, identify emerging technologies and their military applicability; two, identify technologies that require adaptation for military use; and three, introduce innovators and entrepreneurs to national security challenges.

University-Affiliated Army Research Centers (UARC), Department of Defense: Designed to develop and maintain essential engineering and technology for the Department of Defense and the US Army, UARCs are collaborative laboratories used by universities, industry and the Army to conduct research on US defense issues. Current UARCs include: the Institute for Collaborative Biotechnologies (ICB), the Institute for Creative Technologies (ICT), the Institute for Soldier Nanotechnologies (ISN), and the Institute for Advanced Technology.[210]

Office of Innovation and Entrepreneurship (OIE), US Economic Development Administration, Department of Commerce: Created in 2010 by former Secretary of Commerce Gary Locke, the Office of Innovation and Entrepreneurship (OIE) promotes innovation and entrepreneurship domestically. OIE's 2015 work included support for the i6 Challenge, a program that fosters innovation and entrepreneurship in rural areas, and the Seed Fund Support Grants, a program providing grant funding for seed capital funds.

IDEA (Innovation, Design, Entrepreneurship and Action) Lab, Department of Human Health & Services: The the mission of this innovation lab in HHS is to enhance and protect the health and well-being of the public. The IDEA Lab's current initiatives include the HHS Ignite Accelerator (a program supporting HHS staff to test new ideas), the HHS Ventures Fund (a fund for HHS staff for innovations that transform departmental operations), the HHS Entrepreneurs-in-Residence Program (an outside talent program designed to solve complex problems in health and the delivery of human services), the HHS Innovators-n-Residence Program (a partnership with private and nonprofit organizations exploring areas of mutual interest), the HHS Buyers Club (a program seeking to modernize IT acquisition), the Health Data Initiative (an open data program for health & social service data), HHS Competes (an external incentive prize competition program) and the Invent Health Initiative (a program to encourage small-scale inventors to design solutions for home health and clinical care challenges).

The Lab@OPM (Office of Personnel Management): Created in 2012, the goal of the Lab@OPM is to translate innovative ideas into action. The OPM Lab partners with federal agencies to design and test solutions to complex problems. Focusing on human-centered design methods, the Lab's most recent project included the redesign of the application for USDA's National School Lunch Program.

Federal Chief Information Officer (Federal CIO): This role was technically created in 2002 under the E-Government Act of 2002. At that time, the position was previously known only as Administrator for E-Government and Information Technology. In 2009, the Obama Administration added the title of Federal CIO and expanded the Administrator position, with both titles held by a single person. The CIO's role is to oversee the planning of information technology investments at the federal level, as well as the budgets and policies associated. With that, the CIO focuses on how information is shared and kept private both for and within the federal government. The Federal CIO is

positioned under the Deputy Director for Management of OMB, and together with the CIO of Homeland Security they make up the CIO Council.

Social and Behavioral Sciences Team (SBST): Established as the Social and Behavioral Insights Team in 2015, SBSTis a cross agency group of applied behavioral scientists, program officials and policymakers. The SBST includes leading behavioral scientists and innovators from across the country. In September 2016, SBST released its second annual report detailing incredible successes in their short existence. Example of work includes a collaboration with the Bureau of Prisons to develop a 'Reentry Handbook' to help reduce recidivism.

White House Office of Digital Strategy: As part of the Obama Administration's effort to build a 21st century government, the Office of Digital Strategy was created in 2009 to improve engagement between the White House and US citizens using digital technology. The Office of Digital Strategy is composed of more than twenty person team and manages a number of digital tools for the White House, such as social media accounts and the flagship Executive Office website whitehouse.gov.

USAID Global Development Lab: Launched in 2014, the US Global Development Lab is a new evolution of USAID that seeks to increase the application of science, technology, innovation, and partnerships to extend the Agency's development impact in helping to end extreme poverty. The focus areas include: food security and nutrition modernizing food assistance; ending preventable child and maternal deaths; energy access; water solutions; child literacy; financial inclusion; human rights, participation, and accountability; and humanitarian response.

Programs/Initiatives

Small Business Innovation Research (SBIR) Program, Small Business Administration (SBA): Structured in three phases, SBIR is an award-based program that engages US small businesses in federal research and development in technology. The program is housed in the Small Business Administration, but individual SBIR research and development solicitations and awards are administered by eleven different federal agencies. SBIR funding totals more than $2 billion annually, and more than half is currently deployed at the Department of Defense.

Small Business Technology Transfer (SBTT) Program, Small Business Administration (SBA): Similar to the SBIR program, the SBA's SBTT program also deploys capital for research and development in transformational technology. SBTT is structured as a phased awards program, and it funds innovation projects conducted jointly by US small businesses and nonprofit research institutions.

Long-Range Research and Development Planning Program (LRRDPP), Department of Defense: As part of the Defense Innovation Initiative launched in 2014 by Defense Secretary Chuck Hagel, the LRRDPP was implemented to identify current and emerging technology with the potential to advance US military capabilities between 2025-2030. Using LRRDPP, individuals from inside and out of government submitted more than 300 technology concepts to the DoD. Unfortunately, no information is publically available on the concepts reviewed or accepted by this program.

Rapid Innovation Fund, Department of Defense: Established by the 2011 National Defense Authorization Act, which was reauthorized in 2016, the Rapid Innovation Fund (RIF) is a competitive, merit-based program that transitions innovative technologies built by small businesses into Defense Acquisition Programs. In its first five years, RIF awarded 450 contracts and invested more than $1.4 billion to transition technologies submitted to the program. Example projects include a checkpoint explosive detection system, a handheld aircraft vibration data tool, and a traumatic brain injury diagnostic device.

Hack the Pentagon Cybersecurity Initiative, Department of Defense (DoD): A pilot program developed by DoD Digital Service team, this initiative invites vetted computer hackers to identify cybersecurity vulnerabilities in DoD's public webpages. At the program's first event 1,400 hackers participated and resulted in the identification of 138 bugs.

Athena Project, Department of the Navy: Created in 2013, the Athena Project is a US Navy initiative that provides enlisted sailors with the opportunity to compete in pitch competitions designed to innovative ideas to improve the Navy. Prior concept winners include an idea for improving onboard optical sensors and a prototype for solving damage control programs on shipboard spaces.

Chief of Naval Operations' Rapid Innovation Cell (The Cell), Department of the Navy: Started by the former Chief of Naval Operations, the Rapid Innovation Cell works with Navy officers to develop innovative technology and processes that can be applied to provide solutions for the Navy. The Cell contains twelve to fifteen members at any point in time and provides funding, training, and other support for incubating proposed technology projects. Previous cell projects include a $100,000 augmented reality initiative, a $1.4 million initiative to develop a biomimetic unmanned undersea vehicle, and a $550,000 initiative to develop and test an aviation maintenance software application.

Environmental Security Technology Certification Program (ESTCP), Department of Defense: Established in 1995, this program identifies innovative environmental technologies that address DoD environmental challenges and provides funding for rigorous evaluations of the identified technologies. Technologies are chosen through annual solicitations and funds are available to researchers from Federal organizations, universities, and private companies. Previous ESTCP technologies include: a system to detect and classify unexploded weapons in shallow water; a software system to reduce the quantity of scrap metal used during munitions response projects; and a geophysics toolbox for characterizing contaminated sites.

Technology Innovation Clusters Program, Environmental Protection Agency: An EPA program providing advisory services to geographic clusters of businesses, government, research institutions, and other organizations focusing on a particular environmental technology issue. The program's advisory services include the dissemination of information on best practices, connecting cluster needs with EPA programs, and hosting convenings among cluster stakeholders.

Appendix C

White House Innovation Chronology—Programs & Offices

Programs & Offices

(This list is strictly illustrative, it is neither comprehensive nor complete)

Year Established		Program/Office
1993	Clinton Administration	**National Partnership for Reinventing Government (NPR)** Formerly known as National Performance Review, NPR was the Clinton-Gore Administration's initiative to bring reform to the federal government works. Its goal was to create a government that "works better and costs less." With Vice President Al Gore at its helm, NPR operated for the duration of the administration through several phases of initiatives.
1999	Clinton Administration	**E-Commerce Working Group** Created by the Clinton Administration to facilitate the growth of electronic transactions by identifying outdated legislation impeding electronic commerce, and invited state and local representatives to help find and revise such laws and regulations.
2000	Clinton Administration	**US Government's First Web Portal (FirstGov.gov)** Launched in Oct. 2000, FirstGov.gov was the nation's first government web portal, and it was designed to make citizen interactions with the government easier and more efficient. In 2003, FirstGov.gov received the Innovations in American Government Award. In 2007, FirstGov.gov was changed to USA.gov. Today, USA.gov continues that commitment and is part of the Office of Citizen Services and Innovative Technologies in the General Services Administration (GSA).
2001	OMB	**Office of E-Government and Information Technology (E-Gov)** This office was introduced in OMB in Spring of 2001, and was expanded by the E-Government Act of 2002. In its current form, E-Gov is headed up by the Federal Chief Information Officer and develops and provides direction in the use of Internet-based technologies to make it easier for citizens and businesses to interact with the federal government, save taxpayer dollars, and streamline citizen participation.
2004	Bush Administration	**Millennium Challenge Corporation (MCC)** The Millennium Challenge Corporation (MCC) is an innovative and independent US foreign aid agency that is helping lead the fight against global poverty. Created by the US Congress in January 2004 with strong bipartisan support, MCC is changing the conversation on how best to deliver smart US foreign assistance by focusing on good policies, country ownership, and results.
2005	Bush Administration	***Proposed* National Innovation Act of 2005** While this act was not passed in Congress, it proposed a variety of innovation-bolstering initiatives, including the establishment President's Council on Innovation and the Innovation Acceleration program. This bill also proposed to double NSF funding by 2011 and required the National Institute of Standards and Technology to focus on manufacturing.
2007	Bush Administration	**America COMPETES Act (American Competitiveness Initiative of 2007)** America COMPETES included requirements to double funding for innovation-enabling research at federal agencies over a ten-year period. America COMPETES retained the increase in NSF funding detail within the proposed National Innovation Act from 2005, however while this bill passed its the budget was never approved.
2007	OMB	**MAX (max.gov)** MAX was created in the late 1970's as an online platform to streamline the budget process at OMB. In 20017, MAX was re-conceptualized to serve as an online resource for collaboration across offices both within and beyond the federal government.

Year Established		Program/Office
2009	Obama Administration Transition Team	**Technology Innovation and Government Reform Working Group (TIGR)** TIGR was created during the Obama transition to help the then incoming administration implement their Innovation Agenda. The Agenda included a range of proposals to create a twenty-first century government that is more open and effective; leveraging technology to grow the economy, create jobs, and solve our country's most pressing problems; respect the integrity of and renew our commitment to science; and catalyze active citizenship and partnerships in shared governance with civil society institutions. The Working Group was organized into four sub-teams: (1) innovation and government, (2) innovation and national priorities, (3) innovation and science, and (4) innovation and civil society.
2009	Domestic Policy Council	**Office of Social Innovation and Civic Participation (SICP)** Established by the Obama Administration, SICP is situated within the Domestic Policy Council in the White House. SICP has three focus areas, each comprised of discrete initiatives: first, the promotion of leadership and service as a solution, for example, SICP has worked with national and community service initiatives, including United We Stand; second, investment and incentives for innovative, solutions-based projects which has resulted in the Department of Education's Investing in Innovation (i3) Fund, the Social Innovation Fund, and the Community Solutions Tour; and third, innovative methods of collaboration, which has spurred various public-private partnerships.
2009	White House Office	**The Office of Digital Strategy** The Office of Digital Strategy was created at the White House to ensure that the 'voice' of the President is communicated with unprecedented immediacy and accessibility. This new office manages the social media and other online platforms for the White House. For example, the Office of Digital Strategy created a platform for citizens to more directly communicate and lobby the government—bypassing traditional mediums such as lobbyists and advocacy campaigns—this petition website is called *We the People*. The Obama Administration also appointed the White House's first ever Chief Digital Officer.
2010	GSA	**The Office of Citizen Services and Innovative Technologies (OSCIT)** OSCIT was created in 2010 with the bifurcation of the Office of Citizen Services and Communications into the OSCIT and the Office of Communications and Marketing. In 2014, 18F was established within the Office of Citizen Services and Innovative Technologies (OSCIT) and ran in parallel with the Digital Government Strategy Digital Services Innovation (DSI) Center.
2012	GSA/White House	**Presidential Innovation Fellows (PIF)** Founded in 2012 by then US CTO, Federal CIO, CTO of Department of Veterans Affairs and White House leadership, PIF brings innovators from the private, nonprofit and/or academic sectors together with the highest leadership in the federal government to tackle some of the US's biggest challenges. Working for only twelve months, fellows apply a lean start-up mentality to jump-start creative solutions to solve the great problems of our nation. Projects include, Police Data Initiative, Human-Centered Design to support veterans, building and scaling 18F (program details below), VA Innovation Creation Series to accelerate the development of personalized assistive technologies and prosthetics to improve care and quality of life for disabled veterans, Every Kid in a Park Initiative, and many others. By Executive Order, President Obama made PIF a permanent feature in the federal government in 2015. However, an executive order can be rescinded by a future president. In 2016, the TALENT Act of 2016 (Tested Ability to Leverage Exceptional National Talent Act, H.R. 5658) was introduced to codify PIF; this bill passed the House in July 2016 and as of September 2016 remains with the Senate. PIF is now managed out of the newly formed Technology Transformation Service (TTS) in the General Services Administration.

Year Established		Program/Office
2014	OMB	**US Digital Service (USDS)** Launched in 2014 following the launch and recovery of healthcare.gov, USDS is a digital consultation service within the government to modernize digital service and federal websites. USDS is the federal governments digital service 'swat-team'—they are recruited and specialize in delivering solutions fast to tackle the government's most critical digital issues. USDS uses the best of product design and engineering practices to transform the way government works for the American people. USDS problem solvers strive to make critical services, such as healthcare, student loans, and veterans' benefits, as simple as buying a book online. Recently, USDS published the USDS Playbook providing the government with a concise handbook on how to build more efficient and helpful government services. Current programs include, digital services for veterans, modernizing the, immigration system, supporting the day to day efforts of Healthcare.gov, and expanding access to government information in consultation with 18F, for example making the Federal Election Commission (FEC) databases more accessible via open APIs.
2014	GSA	**18F** Created in 2014, 18F is a digital consultancy inside of the General Services Administration (GSA). 18F is a team of top-notch designers, developers, researchers, federal employees, and product specialists inside GSA. 18F gets its name from the location of its headquarters at 18 and F Streets in Washington, DC. 18F is a civic consultancy for the government, within the government, to enable agencies to rapidly deploy tools and services that are easy to operate, cost efficient, and reusable. 18F is a growing group with staff situated around the country in Washington, San Francisco, Chicago, New York, Dayton, and a handful of other cities. Recent projects include: Navy Reserve / Ready to Serve (R2S), the Department of Education's collegescorecard.ed.gov, and analytics.usa.gov. In 2016, 18F became part of GSA's newly formed Technology Transformation Services.
2014	USAID	**US Global Development Lab (GDL)** Launched in 2014, the US Global Development Lab is a new evolution of USAID that seeks to increase the application of science, technology, innovation, and partnerships to extend USAID's development impact in helping to end extreme poverty. Focus areas include: food security and nutrition modernizing food assistance; ending preventable child and maternal deaths; energy access; water solutions: child literacy; financial inclusion; human rights, participation, and accountability; and humanitarian response. The Lab is headed by Ann Mei Chang, who holds the title of Chief Innovation Officer and Executive Director.
2015	White House	**Social and Behavioral Sciences Team (SBST)** Established as the Social and Behavioral Insights Team in 2015, SBST to bring the insights and tools of behavioral science into the federal government. The Social and Behavioral Sciences Team includes leading behavioral scientists and innovators from across the country. SBST is organized under the National Science and Technology Council, and receives support from the Office of Evaluation Sciences (OES) at the General Services Administration (GSA).
2016	GSA	**Technology Transformation Service (TTS)** This new office within GSA houses the agency's tech-focused teams: 18F, the PIF program, the Social and Behavioral Sciences Team, and the Office of Citizen Services and Innovative Technologies. The aim of TTS is to build on GSA's commitment to assist other agencies with IT development and modernization, and provide a foundation for government's larger digital transformation. GSA Administrator Denise Turner Roth said in a release dated May 3, 2016, "By creating the Technology Transformation Service, we are demonstrating our long-term commitment to help agencies create accessible, efficient, user-centered and secure technology." Phaedra Chrousos, formerly associate administrator of OCSIT, served as TTS's first commissioner. Her deputy was Aaron Snow, executive director of 18F.

Appendix D

White House Innovation Chronology—Key Roles & Positions

Key Roles & Positions

(This list is strictly illustrative, it is neither comprehensive nor complete)

Year Established		Role/Position
2009	OMB	**Federal Chief Information Officer (Federal CIO)** (Vivek Kundra '09 - '11; Steven VanRoekel '11-'14; acting CIO Lisa Schlosser '14-'15; Tony Scott '15-Present) The Federal CIO position was created in 2002 under the E-Government Act of 2002. It was previously titled Administrator for E-Government and Information Technology. The title of CIO was not used until 2009. The CIO's role is to oversee the planning of information technology investments at the federal level, as well as associated budgets and policies. The Federal CIO focuses on how information is shared and kept private for and within the federal government, and is also the administrator of the Office of Electronic Government.
2009	Deptartment of State	**Senior Advisor for Innovation** (Alec Ross) The first to hold this title, Alec Ross advised Sec. Clinton on technology and innovation and was known as the 'tech guru' in the Department of State. 'His principal projects were the "21st century statecraft initiative," an effort to integrate technology into diplomacy and reach out to new communities, and "Civil Society 2.0," a project that helped more than 1,100 NGOs in over eighty countries build online communities.'
2009	OSTP	**Chief Technology Officer of the US (US CTO)** (Aneesh Chopra '09-'12; Todd Park '12-'14; Megan Smith '14-Present) In 2009, President Obama, with Senate approval, appointed the first US CTO to promote technological innovation and help the country meet its goals for job creation, reducing healthcare costs, and protecting the homeland. The role of the US CTO is to study how technology, and its concurrent policies, data analysis, and innovations can come together to improve our nation's future. This position was created out of the Associate Director of OSTP role and serves as an Assistant to the President.
2014	OSTP	**Technology Advisor, Silicon Valley** (Todd Park) The "first of his kind," former CTO of the US Todd Park serves as the Technology Advisor for the White House in Silicon Valley. The Technology Advisor position was created to support two central goals of the President's Smarter IT Delivery agenda: (1) recruit more top tech talent, such as USDS director Mikey Dickerson, into government, and (2) to identify innovative ways to improve the quality of government digital services. He will also help ensure that the administration has an on-the-ground sense of how technology is evolving on the West Coast and can craft policy and initiatives accordingly. Interested in integrating concepts of "big data" and healthcare, as well as how to incorporate innovation within the government, Park was instrumental in founding the Presidential Innovation Fellows program in 2012.
2015	OSTP	**Chief Data Scientist** (DJ Patil) Created in 2015, the position of OSTP Chief Data Scientist serves concurrently the Deputy CTO for Data Policy at the White House to further embed innovation within the administration. Operates within three areas: precision medicine, open data (e.g., data.gov), and tech talent (e.g., how can government recruit talent to capitalize on open data). Coining the phrase "data scientist" to describe what he does, DJ Patil works to address how data can stimulate technology and innovation practices. His focuses span data's effects on health care policy and bridging computational and social sciences to analyze possible outcomes.

Year Established		Role/Position
2015	White House Office	**Chief Digital Officer** (Jason Goldman '15-Present) Created in 2015, the Chief Digital Officer leads the White House Office of Digital Strategy and is responsible for overseeing the digital communications, profiles and initiatives at the White House.
2016	GSA	**Commissioner, Technology Transformation Service** Phaedra Chrousos, formerly associate administrator of OCSIT, served as the Technology Transformation Service's first commissioner. Her deputy was Aaron Snow, executive director of 18F. GSA Administrator Denise Turner Roth said in a release dated May 3, 2016, "By creating the Technology Transformation Service, we are demonstrating our long-term commitment to help agencies create accessible, efficient, user-centered and secure technology." Phaedra recently resigned from this position and TTS is searching for a new commissioner to carry the new office's vision forward.

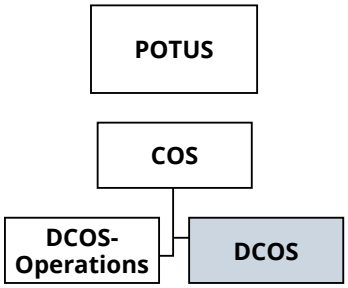
Appendix E

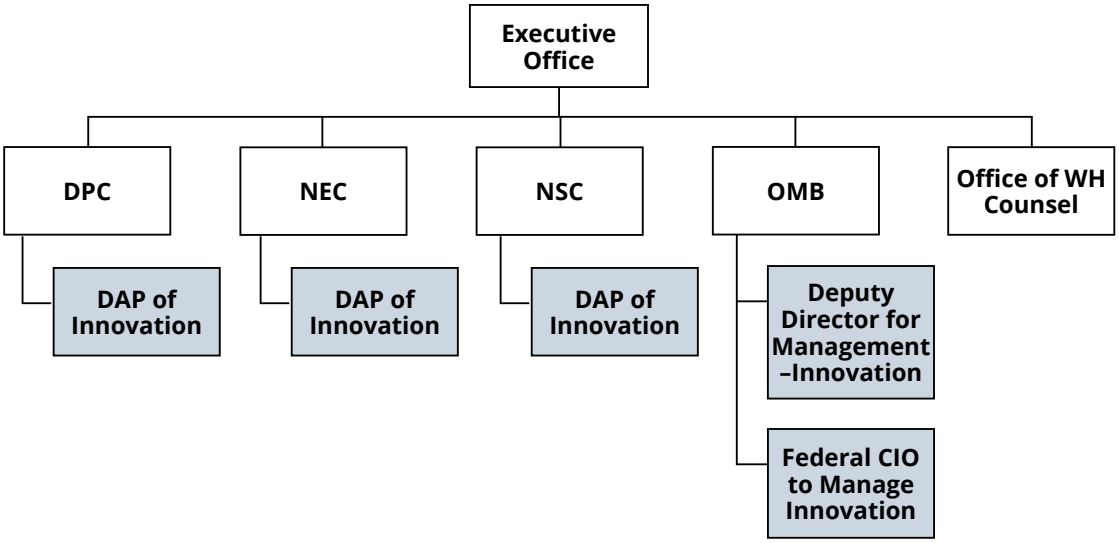
White House Structural Recommendations

OPTION 1: Empower a Deputy Chief of Staff to Manage the Innovation Portfolio with Support from Designated Deputy Assistants to the President in the Councils

Proposed Executive Branch Structure

Maintain current Executive Office structure, and task deputy assistants to president in councils and the Deputy Director for Management and Federal CIO at OMB with managing the innovation agenda. A deputy chief of staff 'of implementation' will lead and coordinate innovation efforts.





These diagrams are illustrative and do not reflect all offices within the White House.

OPTION 2: Create an Innovation, Data, Evidence, and Adaptability (IDEA) Council at the White House (Executive-Level Leadership)

Figure 1. Proposed Executive Branch Structure with New IDEA Council

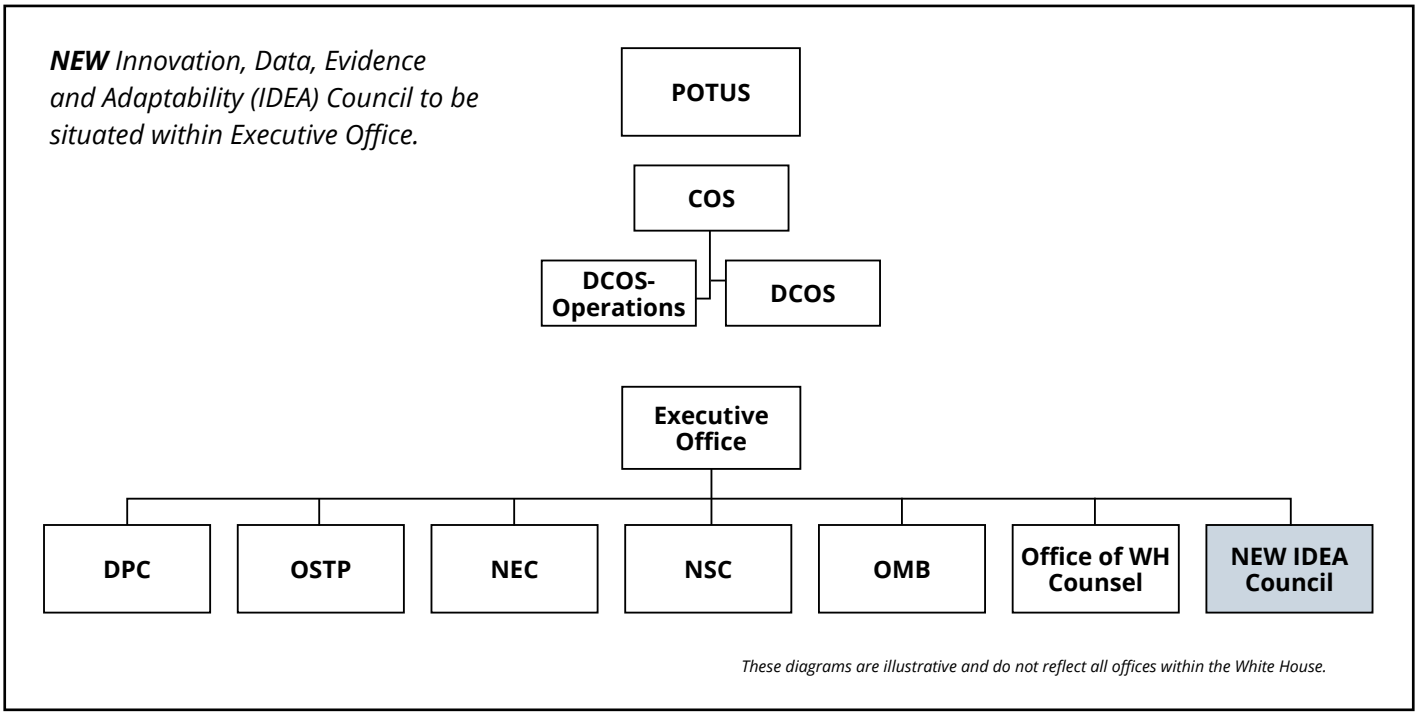


Figure 2. Proposed Structure of New IDEA Council

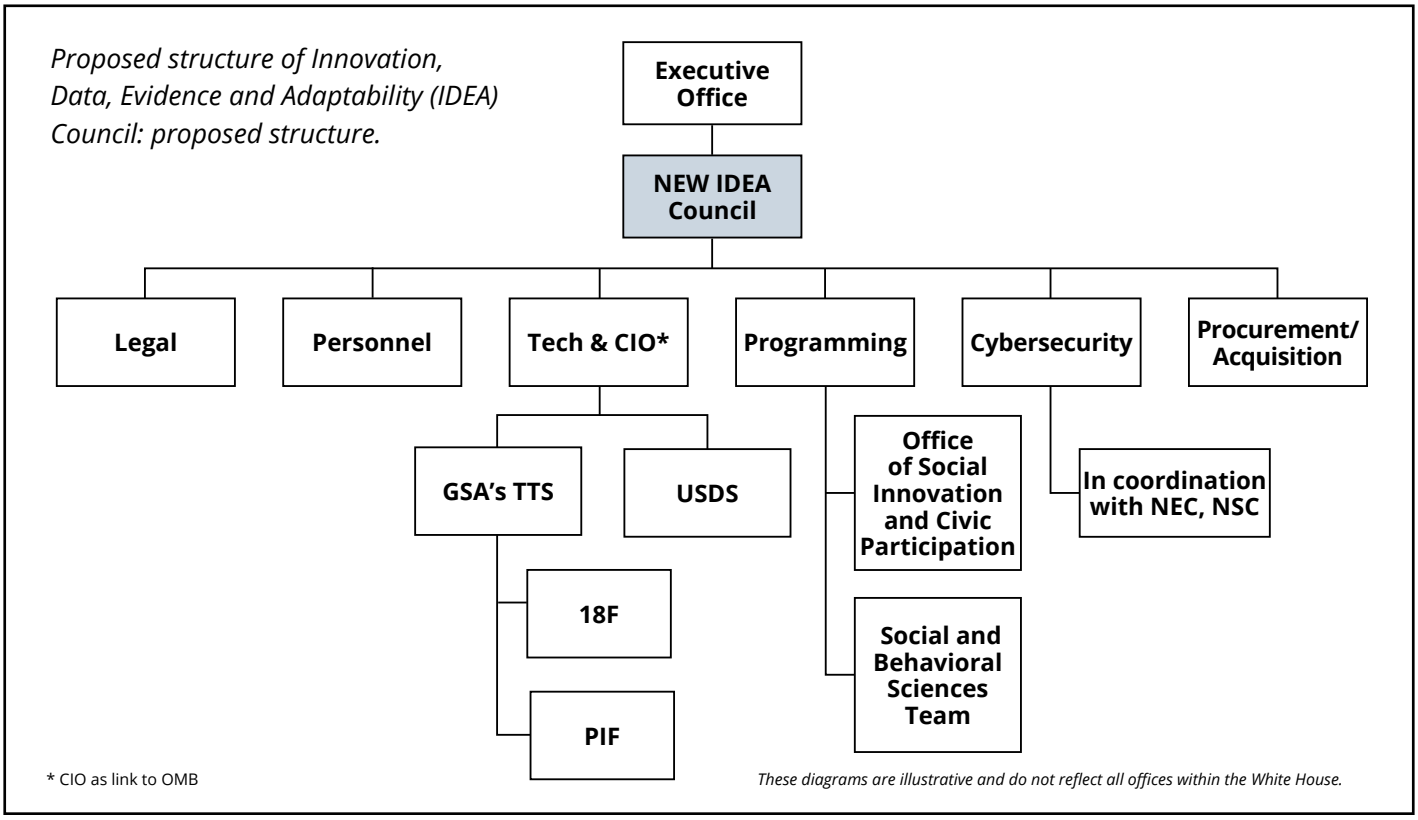
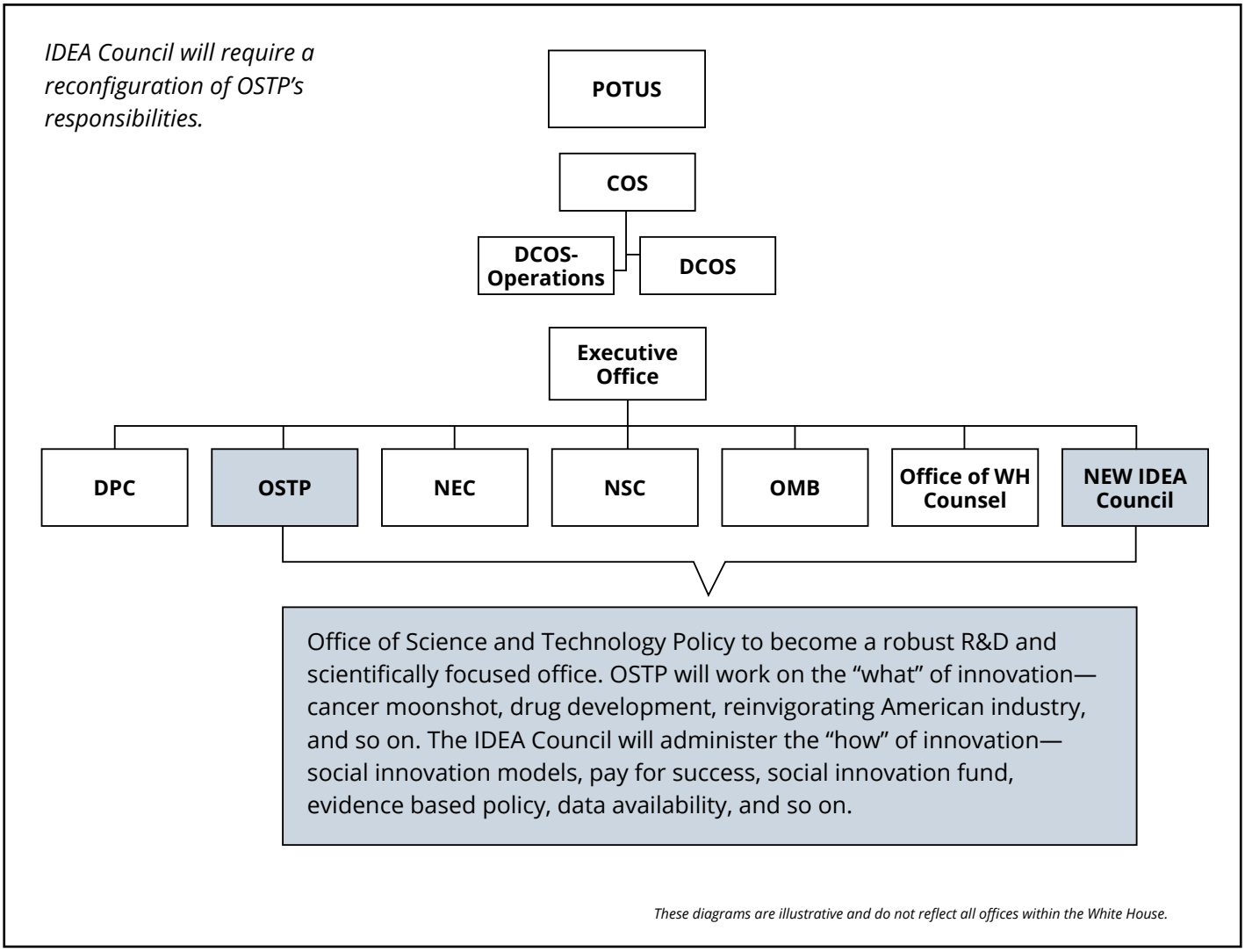


Figure 3. OSTP and IDEA Council Structure



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beeckcenter
social impact + innovation

Beeck Center for Social Impact + Innovation
Georgetown University
3700 O Street, NW, ICC-100
Washington, DC 20057

beeckcenter.georgetown.edu
@BeeckCenter

McCourt School of Public Policy

Massive Data Institute
Georgetown University
Old North, Suite 100
37th and O Streets, NW
Washington, DC 20057

mccourt.georgetown.edu
@McCourtSchool