Tech Policy To-Do List

April 2017

ITIF
INFORMATION TECHNOLOGY & INNOVATION FOUNDATION

Tech Policy To-Do List

While policy discussions about technology and innovation issues often focus narrowly on iconic places like Silicon Valley or Boston's Route 128 corridor, America's innovation-driven, high-tech economy is widely diffused—and every state and congressional district has a stake in its success.

As a nonpartisan think tank focusing on the rapidly evolving intersection of technology, innovation, and public policy, one of the Information Technology and Innovation Foundation's (ITIF's) most important roles is to develop actionable proposals and insights that policymakers can trust to foster innovation, growth, and progress across America and in every congressional district and state. This report provides a menu of such ideas for the Trump administration and 115th Congress.

It is not intended to be a comprehensive analysis of all tech policy issues currently before Congress. Nor should the fact that a proposal is excluded here be interpreted to mean that ITIF doesn't support it. Rather, this list is intended to highlight a selection of new ideas that may not yet have received adequate attention. It is organized by topic area, with short summaries of each idea and citations for additional details.

For any questions or for more information, please contact ITIF at mail@itif.org or 202-449-1351.

(Last updated April 17, 2017)

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INNOVATION AND COMPETITIVENESS

Innovation

The White House or Congress should create an OMB Office of Innovation Policy Review.

All too often, federal agencies propose regulations with little consideration about how they will affect innovation. And while the Office of Management and Budget's (OMB's) Office of Information and Regulatory Affairs (OIRA) is tasked with reviewing major regulations from a static cost-benefit perspective, the office does not explicitly review regulations for potential impacts on longer-term dynamic effects (e.g., innovation). To remedy this, the administration or Congress should create within OMB an Office of Innovation Review whose mission should be to serve as an "innovation champion" in the regulatory process. The office should have authority to push agencies to either affirmatively promote innovation or achieve a particular regulatory objective in a manner least damaging to innovation.

More details: *Stuart Benjamin and Arti Rai, "Structuring U.S. Innovation Policy: Creating a White House Office of Innovation Policy" (Information Technology and Innovation Foundation, June 2009), https://itif.org/publications/2009/06/24/structuring-us-innovation-policy-creating-white-house-office-innovation.*

The White House should charge every federal agency with naming a chief innovation officer to craft and implement an innovation strategy.

Federal agencies can drive innovation not only in their own programs and operations, but also in the broader sphere of the economy they influence. Yet few agencies, if any, have formal innovation strategies. The White House should charge every agency with developing a comprehensive innovation strategy. This should cover not only how the agencies themselves will innovate internally, but also how they can spur innovation in the sectors of the economy they impact. To ensure these plans are carried out, the White House should appoint chief innovation officers (CINOs) for every cabinet-level agency (along with other technology-related agencies, such as NASA), and these federal CINOs should meet quarterly to exchange and cross-pollinate best practices for innovation.

More details: *"Transition Memo to President Trump: How to Spur Innovation, Productivity, and Competitiveness" (Information Technology and Innovation Foundation, November 2016), https://itif.org/publications/2016/11/16/transition-memo-president-elect-trump-how-spur-innovation-productivity-and.*

Congress should create a commission to identify mechanisms to combat corporate short-termism and promote long-term investment in innovation.

Any national innovation policy needs to include measures to counter the pressure that corporations face to demonstrate short-term financial performance, because it leads to less long-term business investment in the foundations of innovation. One easy next step would be for Congress to establish a national commission to identify legislative and regulatory steps that would encourage companies to invest more for the long term. For example, such a commission might consider a proposal from the Institute of Corporate Directors to replace quarterly financial reports with less frequent updates, such as half-yearly results.

More details: *Robert D. Atkinson, "Restoring Investment in America's Economy" (Information Technology and Innovation Foundation, June 2016), https://itif.org/publications/2016/06/13/restoring-investment-americas-economy.*

Congress should fund the National Strategic Computing Initiative and related high-performance computing initiatives at a level of at least $325 million annually for five years.

High-performance computing has become indispensable for enterprises, scientific researchers, and government agencies to generate new discoveries and to innovate breakthrough products and services. As such, high-performance computers are contributing significantly to scientific progress, industrial competitiveness, national security, and quality of life. But U.S. leadership in high-performance computing is increasingly under threat, as competitor nations invest heavily and pursue aggressive strategies in the field. To stay ahead, the United States needs a robust and stable stream of funding, as called for in the National Strategic Computing Initiative.

More details: *Stephen Ezell and Robert D. Atkinson, "The Vital Importance of High-Performance Computing to U.S. Competitiveness" (Information Technology and Innovation Foundation, April 2016), https://itif.org/publications/2016/04/28/vital-importance-high-performance-computing-us-competitiveness.*

Competitiveness

Congress should create a U.S. Economic Competitiveness Commission.

It's impossible to have a vibrant economy without a globally competitive traded sector. Dozens of nations have specific strategies to ensure they do, and so should the United States. To that end, Congress should create a 13-member commission that provides an independent assessment of U.S. competitiveness in traded sectors, including but not limited to manufacturing. A report released every other year should analyze U.S. weaknesses and offer targeted recommendations to address them and improve the country's position across key traded sectors. House and Senate leaders from the respective parties should each appoint three members and the administration one member.

More details: *Stephen Ezell and Robert D. Atkinson, "Fifty Ways to Leave Your Competitiveness Woes Behind: A National Traded Sector Competitiveness Strategy" (Information Technology and Innovation Foundation, September 2012), https://itif.org/publications/2012/09/20/fifty-ways-leave-your-competitiveness-woes-behind-national-traded-sector.*

Congress should create a new traded-sector analysis unit within the federal government.

No federal entity is responsible for competitiveness analysis. Statistical agencies see their jobs as accumulating facts, not analyzing them. Thus, there is little understanding of where the United States is competitive globally. So, Congress should task the National Institute of Standards and Technology (NIST) with creating a new traded-sector analysis unit that prioritizes interpretation and analysis. It should assess key indicators of overall U.S. competitiveness performance—such as foreign direct investment (FDI), jobs, output, and market share, and develop strategic policy road maps for key traded sectors.

More details: *Stephen Ezell and Robert D. Atkinson, "Fifty Ways to Leave Your Competitiveness Woes Behind: A National Traded Sector Competitiveness Strategy" (Information Technology and Innovation Foundation, September 2012), https://itif.org/publications/2012/09/20/fifty-ways-leave-your-competitiveness-woes-behind-national-traded-sector.*

The White House or Congress should require OMB's Office of Information and Regulatory Affairs to incorporate a "competitiveness screen" in its review of federal regulations.

Before global trade intensified, the federal government could afford to impose new regulations and give little thought to their impact on competitiveness. But today, regulation can increase costs or impose rigidities to an extent that makes globally traded industries less competitive internationally. To remedy this, Congress or the White House should require the Office of Information and Regulatory Affairs (OIRA) to review any new, nontrivial regulations to assess their impact on first-order competitiveness, and OIRA should place the highest priority on reviewing and reforming existing regulations that negatively affect traded sectors.

More details: *Stephen Ezell and Robert D. Atkinson, "Fifty Ways to Leave Your Competitiveness Woes Behind: A National Traded Sector Competitiveness Strategy" (Information Technology and Innovation Foundation, September 2012), https://itif.org/publications/2012/09/20/fifty-ways-leave-your-competitiveness-woes-behind-national-traded-sector.*

Congress or the White House should create a national industrial intelligence unit within the National Intelligence Council to better assess competitive challenges to the U.S. economy.

There is no entity within the federal government responsible for coordinating agency efforts to analyze and respond to the strategic challenge of foreign innovation mercantilism in a holistic way. To fill this gap, the president should establish and staff a new national industrial intelligence unit, ideally within the existing National Intelligence Council, and charge it with developing a better process and structure to understand the specifics and long-term implications of other nations' economic development strategies so that the United States can respond more effectively. It would also develop approaches to better leverage and disseminate intelligence assets to boost the competitiveness of U.S. companies.

More details: *Robert D. Atkinson, Nigel Cory, and Stephen Ezell, "Stopping China's Mercantilism: A Doctrine of Constructive, Alliance-Backed Confrontation" (Information Technology and Innovation Foundation, March 2017), https://itif.org/publications/2017/03/16/stopping-chinas-mercantilism-doctrine-constructive-alliance-backed.*

The White House should create a sub-directorate within the National Security Council to champion a whole-of-government response to foreign innovation mercantilism.

There are no senior directors in the international economics directorate of the National Security Council (NSC) who are charged with developing strategy or executing tactics to combat foreign countries' innovation-mercantilist practices. Indeed, such competitiveness issues have almost always been a second-order priority in U.S. foreign policy compared with diplomacy and national security considerations. Yet America's national security increasingly depends on its technological leadership. That is why the president should create an NSC sub-directorate, with a senior director or special assistant plus two or three directors to liaise with the highest levels of the executive branch in conceiving and executing a whole-of-government approach to combatting foreign innovation mercantilism.

More details: *Robert D. Atkinson, Nigel Cory, and Stephen Ezell, "Stopping China's Mercantilism: A Doctrine of Constructive, Alliance-Backed Confrontation" (Information Technology and Innovation Foundation, March 2017), https://itif.org/publications/2017/03/16/stopping-chinas-mercantilism-doctrine-constructive-alliance-backed.*

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Productivity

The National Economic Council should direct federal agencies to incorporate productivity growth into their missions.

No economic or financial entity in the federal government—including the National Economic Council, the Council of Economic Advisers, the Commerce Department, and the Federal Reserve Board—has as an explicit part of its mission the goal of advancing productivity. The president should rectify this by issuing an executive order directing all such executive agencies to make productivity growth a core focus. As part of this order, the president should direct the Office of Management and Budget to identify 50 government programs or processes that should be overhauled technologically to deliver greater value at lower cost to taxpayers through increased productivity.

More details: *Robert D. Atkinson, "Think Like an Enterprise: Why Nations Need Comprehensive Productivity Strategies" (Information Technology and Innovation Foundation, May 2016), http://itif.org/productivity.*

The National Economic Council should create a national commission on productivity.

Lagging productivity growth is the country's central economic challenge, yet few policymakers focus on it, and to the extent that they do, they typically consider only the broadest of measures. To bring attention to the issue and begin shaping a more focused national productivity policy, the president should appoint a national commission on productivity and charge it with exploring economic policy options that go beyond the conventional approach of focusing only on ensuring there is a generally conducive business climate with basic "factor inputs" such as skilled labor and ready access to capital.

More details: *Robert D. Atkinson, "Think Like an Enterprise: Why Nations Need Comprehensive Productivity Strategies" (Information Technology and Innovation Foundation, May 2016), http://itif.org/productivity.*

Education and Training

Congress should create a New Schools America fund to support states and cities in developing new kinds of schools.

Educational improvement fundamentally depends on innovation, which requires new forms of learning and schooling. Yet most education "reform" involves doubling down on more of the same. The federal government needs to play a catalytic role to foster more systemic and transformative educational innovation. A New Schools fund would encourage states to institute a new governance and funding model to support specialized schools, including schools focused on science, technology, engineering, and math (STEM); project-based learning; and experiential learning.

More details: *Robert D. Atkinson and Merrilea Mayo, "Refueling the U.S. Innovation Economy: Fresh Approaches to STEM Education" (Information Technology and Innovation Foundation, December 2010), https://itif.org/publications/2010/12/07/refueling-us-innovation-economy-fresh-approaches-stem-education.*

Congress should offer planning grants for regions that want to create alternative types of STEM high schools or universities.

In recent years, a number of universities have begun offering unique approaches to STEM education. They champion experiential learning models in which all teaching is STEM- or technology-oriented and operated on an interdisciplinary basis. Students have to complete internships and solve real engineering and technical problems. In much the same way, STEM-focused high schools allow students to fully explore subjects such as computer science at the secondary level and have proven effective in promoting more and better STEM education, including in poorer school districts. Congress should support this experimentation by appropriating $10 million for the National Science Foundation (NSF) to offer planning grants through its existing Transforming Institution Grants program.

More details: *Stephen Ezell and Robert D. Atkinson, "25 Recommendations for the 2013 America COMPETES Act Reauthorization" (Information Technology and Innovation Foundation, April 2013), https://itif.org/publications/2013/04/22/25-recommendations-2013-america-competes-act-reauthorization; Adams Nager and Robert D. Atkinson, "The Case for Improving U.S. Computer Science Education" (Information Technology and Innovation Foundation, May 2016), https://itif.org/publications/2016/05/31/case-improving-us-computer-science-education.*

Congress should establish cash prizes for colleges and universities that succeed in graduating more STEM students.

America could graduate significantly more STEM students if only colleges and universities made it a priority. To give them incentives to do so, Congress should appropriate approximately $325 million over five years for the NSF to award prizes to colleges and universities that dramatically increase the rate at which freshmen STEM students graduate with STEM degrees, and that demonstrably sustain the increase. Awards could be sized in tiers for small, mid-sized, and large universities. Alternatively, Congress could require NSF to consider an institution's record on STEM "switch-outs" and dropouts, especially among women and minority students, in fields such as engineering and computer science, as a factor in awarding research grants.

More details: *Stephen Ezell and Robert D. Atkinson, "25 Recommendations for the 2013 America COMPETES Act Reauthorization" (Information Technology and Innovation Foundation, April 2013), https://itif.org/publications/2013/04/22/25-recommendations-2013-america-competes-act-reauthorization; Adams Nager and Robert D. Atkinson, "The Case for Improving U.S. Computer Science Education" (Information Technology and Innovation Foundation, May 2016), https://itif.org/publications/2016/05/31/case-improving-us-computer-science-education.*

Congress should create a NSF-industry Ph.D. fellows program.

Doctoral fellowships are key factors in producing more Ph.D. degrees in STEM fields. But compared with the number of science and engineering graduates, NSF now awards less than half as many research fellowships as it did in the 1960s. Rather than expanding the existing NSF Graduate Research Fellowship program (currently funded at $102 million), Congress should appropriate $21 million per year for a new program, where NSF and industry match funds on a dollar-for-dollar basis to support an additional 1,000 STEM Ph.D. fellows.

More details: *Robert D. Atkinson and Merrilea Mayo, "Refueling the U.S. Innovation Economy: Fresh Approaches to STEM Education" (Information Technology and Innovation Foundation, December 2010), https://itif.org/publications/2010/12/07/refueling-us-innovation-economy-fresh-approaches-stem-education.*

Congress should require colleges to report their National Survey of Student Engagement scores.

The National Survey of Student Engagement measures more than 1,300 colleges on student participation in the various programs and activities they offer for learning and personal development. The data can help show which institutions offer compelling educational experiences, but few publicly report their scores. Therefore, Congress should require reporting this data as a "check-off" criterion in the certifications and representations section of any federal higher-education grant proposal.

More details: *Robert D. Atkinson and Merrilea Mayo, "Refueling the U.S. Innovation Economy: Fresh Approaches to STEM Education" (Information Technology and Innovation Foundation, December 2010), https://itif.org/publications/2010/12/07/refueling-us-innovation-economy-fresh-approaches-stem-education.*

The Department of Education should provide matching grants to states for establishing teacher-certification programs in computer science.

To provide more students with the opportunity to learn computer science in a rigorous manner from a certified teacher, all 50 states should have certification programs that allow graduate students in education fields to become teachers specializing in computer science. The Department of Education should create federal matching grants for states implementing these certification programs to incentivize teachers to acquire certifications without making it a requirement that could force out current teachers.

More details: *Adams Nager and Robert D. Atkinson, "The Case for Improving U.S. Computer Science Education" (Information Technology and Innovation Foundation, May 2016), https://itif.org/publications/2016/05/31/case-improving-us-computer-science-education.*

Congress should subsidize the cost of certifications and master's programs for prospective teachers who successfully teach computer science for five years.

The country faces a nationwide shortage of qualified teachers to expand computer-science education. Subsidizing the cost of certification and providing higher wages for teachers who earn certificates will incentivize teachers to acquire them and make teaching a more attractive option for people who are also in high demand in the private sector. Funding for these grants should come from a new program that resembles the "Computer Science for All" plan in the Obama administration's 2016 budget, which proposed $4.1 billion over three years for states to expand computer-science education.

More details: *Adams Nager and Robert D. Atkinson, "The Case for Improving U.S. Computer Science Education" (Information Technology and Innovation Foundation, May 2016), https://itif.org/publications/2016/05/31/case-improving-us-computer-science-education.*

Congress should add expenditures for employee training to the R&D tax credit.

Training and ongoing education for incumbent workers are critical drivers of productivity growth and rising worker incomes. And a key way workers acquire skills is through on-the-job training provided by employers. But U.S. companies invest much less in training today than they did a decade ago. Therefore, to spur greater workforce training while at the same time lowering the effective corporate tax rate, Congress should allow employee training expenses to be added to qualified research expenditures under the R&D tax credit.

More details: *Robert D. Atkinson, "Effective Corporate Tax Reform in the Global Innovation Economy" (Information Technology and Innovation Foundation, July 2009), https://itif.org/publications/2009/07/19/effective-corporate-tax-reform-global-innovation-economy.*

Congress should establish a process to accredit organizations that provide education certifications.

To spur innovation and lower costs in higher education, the federal government should promote alternatives to traditional college diplomas, so individuals can more effectively demonstrate educational mastery to prospective employers. The Department of Education should establish a program to accredit organizations providing educational certifications in much the same way it oversees organizations that provide accreditation of colleges and universities. Establishing an accreditation process for these certifications will serve as a useful indicator of quality for public- and private-sector organizations that want to hire individuals who pursue nondegree learning options. At the same time, the process will begin to break the lock between education and credentialing and help create a new market for alternative certifications. This will bring real competitive pressures to bear on colleges and universities, which will create incentives for better educational outcomes overall.

More details: *Joe Kennedy, Daniel Castro, and Robert D. Atkinson, "Why It's Time to Disrupt Higher Education by Separating Learning From Credentialing" (Information Technology and Innovation Foundation, August 2016), https://itif.org/publications/2016/08/01/why-its-time-disrupt-higher-education-separating-learning-credentialing.*

Congress should encourage federal agencies to accept alternative certifications in lieu of degree requirements.

The federal government should lead by example in breaking the lock between education and credentialing. To that end, it should demonstrate to the private sector the feasibility of using alternative credentials by accepting a suitable set as a substitute for a college degree when filling federal jobs. The Office of Personnel Management should change current requirements for many positions to allow individuals with acceptable scores on relevant certification exams to be eligible rather than just those with a college degree.

More details: *Joe Kennedy, Daniel Castro, and Robert D. Atkinson, "Why It's Time to Disrupt Higher Education by Separating Learning From Credentialing" (Information Technology and Innovation Foundation, August 2016), https://itif.org/publications/2016/08/01/why-its-time-disrupt-higher-education-separating-learning-credentialing.*

The Department of Education should encourage the private sector to recognize and rely on alternative certifications in its hiring decisions.

The Department of Education should work with corporate partners to encourage the use of alternative certifications in hiring decisions. The goal here is to develop a credential that measures skills that many companies expect college graduates to possess upon graduation. If the top employers in America were to agree that they would treat the relevant certified credentialing programs as equivalent to college degrees, they would help create a new market for alternative certifications.

More details: *Joe Kennedy, Daniel Castro, and Robert D. Atkinson, "Why It's Time to Disrupt Higher Education by Separating Learning From Credentialing" (Information Technology and Innovation Foundation, August 2016), https://itif.org/publications/2016/08/01/why-its-time-disrupt-higher-education-separating-learning-credentialing.*

Congress should allow students to use federal aid for alternative learning options, such as massive open online courses.

Much of the direct cost of college is tuition, but most of the rest is room, board, and other living expenses. Federal student aid covers the direct costs of college and room and board and some other expenses. Likewise, Congress should allow students pursuing nondegree educations to be eligible for federal student aid to cover the costs of enrolling in programs, such as certain professional certification programs approved by the Department of Education and massive open online courses (MOOCs), as well as their living expenses. In addition, students should not have to be enrolled in a college or university to use federal student aid to pursue alternative learning options.

More details: *Joe Kennedy, Daniel Castro, and Robert D. Atkinson, "Why It's Time to Disrupt Higher Education by Separating Learning From Credentialing" (Information Technology and Innovation Foundation, August 2016), https://itif.org/publications/2016/08/01/why-its-time-disrupt-higher-education-separating-learning-credentialing.*

The Department of Education should conduct a regular survey of employer skill needs.

Better information on what skills employers value would help spur innovation across the educational system. Unfortunately, this information is often difficult to find because there is no national survey on the specific skills employers desire in recent graduates. The Department of Education should launch an annual employer survey that asks these questions and make the findings available to the public, with individual employer information anonymized.

More details: *Joe Kennedy, Daniel Castro, and Robert D. Atkinson, "Why It's Time to Disrupt Higher Education by Separating Learning From Credentialing" (Information Technology and Innovation Foundation, August 2016), https://itif.org/publications/2016/08/01/why-its-time-disrupt-higher-education-separating-learning-credentialing.*

Manufacturing

Congress should create manufacturing reinvestment accounts for small and mid-sized enterprises.

Congress should establish a 401(k)-like deferred-investment program that would give small and mid-sized manufacturers greater resources to bootstrap themselves by allowing them to make tax-deferred investments through manufacturing reinvestment accounts. The funds would be available for tax-free withdrawal if used for research and development (R&D), workforce training, or capital equipment investments. Connecticut has already put such a program in place.

More details: *Stephen Ezell and Robert D. Atkinson, "Fifty Ways to Leave Your Competitiveness Woes Behind: A National Traded Sector Competitiveness Strategy" (Information Technology and Innovation Foundation, September 2012), https://itif.org/publications/2012/09/20/fifty-ways-leave-your-competitiveness-woes-behind-national-traded-sector.*

Congress should direct the Small Business Administration to shift its focus toward traded-sector firms.

The Small Business Administration (SBA) treats all industries alike in its funding priorities, but industries serving local markets play no role in supporting economic competitiveness, and for the most part their funding simply shifts activity from one firm to another. Neither of these things is true for firms in industries that are globally traded (such as manufacturing). Congress should require the SBA to develop a plan to significantly increase the share of support going to traded-sector firms. Congress should then require that a

significant share of SBA lending—both guarantees and direct lending—go to fund scale-up activities for small and mid-sized traded-sector firms.

More details: *Stephen Ezell and Robert D. Atkinson, "Fifty Ways to Leave Your Competitiveness Woes Behind: A National Traded Sector Competitiveness Strategy" (Information Technology and Innovation Foundation, September 2012), https://itif.org/publications/2012/09/20/fifty-ways-leave-your-competitiveness-woes-behind-national-traded-sector.*

Congress should pass the Made in America Manufacturing Communities Act.

The act authorizes a public-private program to enhance how federal economic development funds encourage American communities to focus not only on attracting individual investments, but also on transforming themselves into globally competitive manufacturing hubs. The act awards preferential consideration to designated communities for up to $1.3 billion in existing federal economic development assistance across 11 federal agencies, thereby reducing burdens that communities and small manufacturers face in navigating and accessing federal support. The legislation will assist regions in thinking strategically about how and where they can be competitive in emerging industries and value chains.

More details: *Robert D. Atkinson and Stephen Ezell, "Ten Principles to Guide the Trump Administration's Manufacturing Strategy" (Information Technology and Innovation Foundation, January 2017), https://itif.org/publications/2017/01/31/ten-principles-guide-trump-administrations-manufacturing-strategy.*

Congress should appropriate funds it has already authorized to launch a manufacturing universities pilot program within the Department of Defense.

Engineering education in the United States has increasingly moved toward more abstract engineering science, leaving university engineering departments more concerned with producing pure knowledge than educating students and working with industry to solve real-world problems. To bridge this gap, the United Sates should designate a core of at least 20 "manufacturing universities" that revamp their engineering programs to focus much more on manufacturing engineering, and, in particular, on work that is relevant to industry. The 2017 National Defense Authorization Act (NDAA) authorized such a manufacturing universities pilot program at the Department of Defense. Congress should now formally appropriate funds to launch that pilot program.

More details: *Stephen Ezell and Robert D. Atkinson, "Fifty Ways to Leave Your Competitiveness Woes Behind: A National Traded Sector Competitiveness Strategy" (Information Technology and Innovation Foundation, September 2012), https://itif.org/publications/2012/09/20/fifty-ways-leave-your-competitiveness-woes-behind-national-traded-sector.*

Congress should continue appropriating funds for the Manufacturing USA program to build out more manufacturing-innovation institutes.

Manufacturing USA is a public-private network of manufacturing-innovation institutes that have played a critical role in revitalizing America's industrial commons and that have contributed to U.S. leadership across a range of advanced-manufacturing process and product technologies. Thus far, 14 institutes have been launched to focus on technologies, including additive manufacturing, digital manufacturing and design innovation, lightweight and modern metals, power electronics, advanced composites, integrated photonics, flexible hybrid electronics, clean-energy smart manufacturing, revolutionary fibers and textiles, robotics, and biopharmaceuticals manufacturing. Congress should appropriate funds to support a next round of industry-identified institutes and support a share of their ongoing operations.

More details: *David M. Hart, Stephen Ezell, and Robert D. Atkinson, "Why America Needs a National Network for Manufacturing Innovation" (Information Technology and Innovation Foundation, December 2012), https://itif.org/publications/2012/12/11/why-america-needs-national-network-manufacturing-innovation.*

The president should launch two new research institutes under the auspices of the Manufacturing USA program to spur innovation in transportation infrastructure.

Manufacturing USA—launched in 2012 as the National Network for Manufacturing Innovation—brings together industry, universities, community colleges, and government agencies to support precompetitive R&D to accelerate innovation in manufacturing. The administration should expand the program with two new institutes led by the Department of Transportation. The first institute should bring together industry, government, and university partners to pursue the R&D necessary for advancing high-impact intelligent-transportation systems and autonomous vehicles, so that these lifesaving technologies reach America's roadways faster. A second institute should investigate new materials for surface transportation, including longer-lasting materials.

More details: *Stephen Ezell and Robert D. Atkinson, "From Concrete to Chips: Bringing the Surface Transportation Reauthorization Act Into the Digital Age" (Information Technology and Innovation Foundation, May 2015), https://itif.org/publications/2015/05/19/concrete-chips-bringing-surface-transportation-reauthorization-act-digital.*

Taxes

Congress should increase the Alternative Simplified Credit to boost private R&D.

The U.S. R&D tax credit is far less generous than that of most other countries. Congress should either increase the alternative simplified credit for R&D from 14 percent to 20 percent—or expand it by enacting a three-tiered credit for qualified expenses that are 50 percent, 75 percent, or 100 percent above firms' previous three-year averages. At the low end, they would continue to receive a 14 percent credit; in the middle band, they could receive a 20 percent credit; and at the high end, they could earn a 40 percent credit.

More details: *Robert D. Atkinson, "Expanding the R&E Tax Credit to Drive Innovation, Competitiveness and Prosperity" (Information Technology and Innovation Foundation, July 2007), https://itif.org/publications/2007/07/24/expanding-re-tax-credit-drive-innovation-competitiveness-and-prosperity.*

Congress should broaden and expand the R&D credit for collaborative research.

The United States provides a 20 percent credit for collaborative R&D, but it only applies to energy research. Congress should eliminate the energy restriction. Research consortia, whether with companies or universities, tend to focus more on more basic and exploratory research, which have big spillovers, with many of the benefits going to other firms and society. Therefore, firms do less of this kind of research than is economically optimal. That is why a number of other countries, including Canada, Denmark, Hungary, Japan, France, Norway, Spain, and the United Kingdom have in the last decade established more generous incentives for this form of research.

More details: *Robert D. Atkinson, "Effective Corporate Tax Reform in the Global Innovation Economy" (Information Technology and Innovation Foundation, July 2009), https://itif.org/publications/2009/07/19/effective-corporate-tax-reform-global-innovation-economy.*

Congress should pass the R&D Workforce Act or a similar knowledge tax credit.

Corporate investment in workforce training has declined substantially over the past two decades. One way to address this while encouraging companies to build out their research and development programs would be to expand the R&D tax credit to include expenses related to workforce training. The R&D Workforce Act being developed in the Senate would expand the categories of allowable expenses under the R&D credit to include wages related to training employees for qualified research activities plus expenses related to developing and implementing training programs.

More details: *Robert D. Atkinson, "How a Knowledge Tax Credit Could Stop Decline in Corporate Training," The Hill, March 9, 2015, http://thehill.com/blogs/pundits-blog/finance/235018-how-a-knowledge-tax-credit-could-stop-decline-in-corporate.*

Congress should pass the Made in America Deduction Enhancement (MADE) Act, which would strengthen the Section 199 domestic production tax deduction.

The Made in America Deduction Enhancement (MADE) Act encourages U.S. manufacturers to use domestically produced, high-quality American content by strengthening the Section 199 domestic production tax deduction. The legislation proposes increasing demand for "Made in USA" inputs by enabling manufacturers to take a 3 percent enhancement in their 199 domestic production tax deduction for every 15 percent increase (over a base amount of 50 percent) in the amount of "Made in USA" inputs they use. The legislation would strengthen domestic manufacturing supply chains and bolster U.S. manufacturing output.

More details: *Contact ITIF Vice President for Global Innovation Policy Stephen Ezell at sezell@itif.org.*

Congress should pass the Support the Small Business R&D Act.

In December 2015, Congress passed the PATH Act, which expanded small businesses' access to the R&D credit by permitting them to claim the credit against their employment taxes or against their alternative minimum credit (AMT) tax. But not enough small businesses are aware that this legislation greatly expands their access to the credit. Accordingly, Congress should pass the Support Small Business R&D Act, which would require the Small Business Administration and the Internal Revenue Service to expand knowledge-sharing and training on these instruments and provide a report to Congress on their progress.

More details: *Stephen Ezell, "A Policymaker's Guide to Smart Manufacturing" (Information Technology and Innovation Foundation, November 2016), https://itif.org/publications/2016/11/30/policymakers-guide-smart-manufacturing.*

Congress should create global knowledge investment zones to attract foreign direct investment.

The federal government should enable a limited number of global knowledge investment zones in and around research agglomerations (e.g., Research Triangle, N.C.; Rochester, N.Y.; and Ames, Iowa) to attract high-value-added foreign direct investment. Communities would compete for the designation by offering incentives such as property-tax waivers, and firms eligible to relocate there would receive a generous mix of benefits to spur innovation and jobs, including special R&D tax credits, streamlined access to university technology, and visa preferences.

More details: *Stephen Ezell and Robert D. Atkinson, "Fifty Ways to Leave Your Competitiveness Woes Behind: A National Traded Sector Competitiveness Strategy" (Information Technology and Innovation Foundation, September 2012), https://itif.org/publications/2012/09/20/fifty-ways-leave-your-competitiveness-woes-behind-national-traded-sector.*

Similar to countries with so-called "patent-box" regimes, Congress should allow U.S. companies to pay a lower corporate tax rate on income generated from innovation-based products.

"Patent boxes" are among the most interesting developments in the race for global competitiveness. So named because they appear as check boxes on tax forms, they allow corporate income from the sale of patented products to be taxed at lower rates than other income. If designed to link the incentive to conducting R&D or producing innovation-based products domestically, this tax reduction would go even further in spurring innovation-based U.S. job creation. By lowering the effective corporate tax rate for knowledge-based firms located in the United States, an "innovation box" also would make it easier for them to take on competitors in other nations that provide robust innovation incentives.

More details: *Robert D. Atkinson and Scott M. Andes, "Patent Boxes: Innovation in Tax Policy and Tax Policy for Innovation" (Information Technology and Innovation Foundation, October 2011), https://itif.org/publications/2011/10/04/patent-boxes-innovation-tax-policy-and-tax-policy-innovation.*

Tech Transfer

Congress should support the innovation potential of rural areas by creating rural innovation institutes.

Many rural areas have suffered decades-long economic decline or stagnation. One way to restore their growth would be to boost their innovation potential. This would help those areas' own economic growth prospects and contribute to America's overall innovation system. Congress should support rural innovation by creating a nationwide network of rural innovation institutes in sectors such as aquaculture, agriculture, wind and water energy, mining, and timber. For example, Congress could task the U.S. Department of Agriculture with leading a major technology initiative around how to get more value-added out of rural communities through fishing, fiber, food, wind, water, etc. Such a program, perhaps in coordination with the U.S. Department of Commerce's Manufacturing Extension Partnership, also could build on and support existing rural manufacturing clusters, such as the carpet cluster in rural Alabama and the snowmobile cluster in northern Minnesota.

More details: *Stephen Ezell and Scott M. Andes, "Localizing the Economic Impact of Research and Development: Policy Proposals for the Trump Administration and Congress" (Information Technology and Innovation Foundation and Brookings Institution, December 2016), https://itif.org/publications/2016/12/07/localizing-economic-impact-research-and-development-policy-proposals-trump.*

Congress should introduce an Open Commercialization Infrastructure Act.

One way to increase the use of America's national R&D infrastructure would be to pass an "Open Commercialization Infrastructure Act" that permits private use of bonded facilities—including universities, federal labs, and public libraries—for certain activities related to entrepreneurial education and training as well as for economic development and job creation. This would be useful because buildings that are financed through tax-exempt bonds currently are not permitted to develop private programming. For example, a small business trying to develop a commercial product would be restricted from taking advantage of a 3-D printer in a makerspace at a bonded facility such as a public library. This and many other kinds of private activities that benefit entrepreneurs—such as business incubators, accelerators, and training programs—are important for broader economic development. Congress should ensure more infrastructure is available for such purposes.

More details: *Stephen Ezell and Scott M. Andes, "Localizing the Economic Impact of Research and Development: Policy Proposals for the Trump Administration and Congress" (Information Technology and Innovation Foundation and Brookings Institution, December 2016), https://itif.org/publications/2016/12/07/localizing-economic-impact-research-and-development-policy-proposals-trump.*

Congress should allocate a share of federal research funding to promote technology transfer and commercialization, such as through a Spurring Commercialization of Our Nation's Research Program.

The current federal system for funding research pays too little attention to commercializing technology and is still based on the linear model that assumes basic research gets easily translated into commercial activity. To address this, the administration should work with Congress to establish an automatic set-aside program that allocates a modest percentage of federal research budgets to technology-commercialization activities. For instance, Congress could allocate 0.15 percent of agency research budgets to fund university, federal laboratory, and state government technology-commercialization and innovation efforts. The funds could be used to provide: 1) "commercialization capacity-building grants" to institutions of higher education pursuing specific initiatives to improve their capacity to commercialize faculty research, and 2) "commercialization-accelerator grants" to support institutions of higher education pursuing initiatives that allow faculty to directly commercialize research in an effort to accelerate research breakthroughs.

More details: *Stephen Ezell and Robert D. Atkinson, "25 Recommendations for the 2013 America COMPETES Act Reauthorization" (Information Technology and Innovation Foundation, April 2013), https://itif.org/publications/2013/04/22/25-recommendations-2013-america-competes-act-reauthorization.*

Congress should develop a proof-of-concept, or "Phase Zero," individual and institutional grant award program within major federal research agencies.

The Small Business Innovation Research (SBIR) program and Small Business Technology Transfer (STTR) program both support innovation, but their approval processes are high bars to clear for very early-stage companies. Too often, there is insufficient funding available at universities (or from other sources) to push nascent technologies to the point where these companies can receive SBIR or STTR grants. A national "phase zero" proof-of-concept program would address this problem by helping more projects cross the so-called "valley of death" from early-stage research to commercialization, by providing infrastructure (e.g., expertise, personnel, and small business and venture capital engagement), and by facilitating the cultural change necessary for universities, federal laboratories, and other nonprofit research organizations to better support these kind of commercialization activities. Kentucky and Louisiana, among other states, have developed such "phase-zero" grants to help firms apply for SBIR grants and support early proof-of-concept research. One way Congress could implement such a proof-of-concept program would be through a grant program to states that agree to match funds on a dollar-for-dollar basis.

More details: *Stephen Ezell and Scott M. Andes, "Localizing the Economic Impact of Research and Development: Policy Proposals for the Trump Administration and Congress" (Information Technology and Innovation Foundation and Brookings Institution, December 2016), https://itif.org/publications/2016/12/07/localizing-economic-impact-research-and-development-policy-proposals-trump.*

Congress should allow a share of SBIR and STTR grant awards to be used for commercialization activities.

SBIR's impact could be much greater if some facets of the program were geared slightly more toward commercialization. Awardees currently are prohibited from using grant money to fund critical commercialization activities that would enable them to raise their profiles and accomplish certain key milestones, so they can build prototypes of new products or services, acquire commercial customers, attract private capital, or accelerate market entry. These activities cover the gamut from intellectual-property development and prosecution to marketing and staff recruitment. To fill these gaps, SBIR awardees should be permitted to expend at least 5 percent of their SBIR funds on commercialization-oriented activities.

More details: *Stephen Ezell and Scott M. Andes, "Localizing the Economic Impact of Research and Development: Policy Proposals for the Trump Administration and Congress" (Information Technology and Innovation Foundation and Brookings Institution, December 2016), https://itif.org/publications/2016/12/07/localizing-economic-impact-research-and-development-policy-proposals-trump.*

Congress should direct NSF to establish stronger university entrepreneurship metrics and use them to provide stronger incentives for commercializing research.

Congress should direct the National Science Foundation (NSF) to partner with the National Institute of Standards and Technology (NIST) to develop a metric for universities to report entrepreneurship and commercialization information annually, including data on new business starts by faculty, spin-offs, license agreements, patenting, and industrial funding of research. Congress should further direct agencies to factor these metrics into their decisions to award research funds.

More details: *Stephen Ezell and Robert D. Atkinson, "Fifty Ways to Leave Your Competitiveness Woes Behind: A National Traded Sector Competitiveness Strategy" (Information Technology and Innovation Foundation, September 2012), https://itif.org/publications/2012/09/20/fifty-ways-leave-your-competitiveness-woes-behind-national-traded-sector.*

Congress should fund a pilot program supporting experimental approaches to technology transfer and commercialization.

A number of organizations are experimenting with novel approaches to bolstering technology transfer from universities (and national laboratories) to industry and accelerating commercialization. Congress should support these novel approaches by including $5 million in the reauthorization of the America COMPETES Act to fund experimental programs through a grant process managed by the Commerce Department's Office of Innovation and Entrepreneurship.

More details: *Stephen Ezell and Robert D. Atkinson, "25 Recommendations for the 2013 America COMPETES Act Reauthorization" (Information Technology and Innovation Foundation, April 2013), https://itif.org/publications/2013/04/22/25-recommendations-2013-america-competes-act-reauthorization.*

Congress should create an "Innovation Voucher" program operated by NIST.

As in almost a dozen other countries, these vouchers would spur innovation and stimulate knowledge transfer by allowing small and mid-sized enterprises to "buy" expertise from universities, national labs, and research institutions to conduct studies, analyze the innovation potential of new technologies, etc. Congress should

facilitate this by authorizing $20 million for National Institute of Standards and Technology (NIST) to fund a pilot program that select states would operate with matching funds.

More details: *Stephen Ezell and Robert D. Atkinson, "Fifty Ways to Leave Your Competitiveness Woes Behind: A National Traded Sector Competitiveness Strategy" (Information Technology and Innovation Foundation, September 2012), https://itif.org/publications/2012/09/20/fifty-ways-leave-your-competitiveness-woes-behind-national-traded-sector.*

IT AND DATA

Cybersecurity

The administration and Congress should require the federal government to offer an electronic identification to U.S. residents who desire one.

Many nations have moved quickly to invest in electronic ID (e-ID) systems that allow individuals to prove their identities, or attributes about their identities, to information systems. Without federal action, this market will remain stagnant in the United States, which will inhibit people from being able to complete transactions entirely online, such as purchasing a home. The government should spur the supply of e-IDs by directing a federal agency to offer them to U.S. residents for a reasonable fee. Both the State Department and the Department of Homeland Security have systems and processes in place that could be adapted to issue e-IDs. They could be offered as standalone products, such as smartcards or software certificates for mobile phones, or on existing identification documents, such as passports.

More details: *Daniel Castro, "Explaining International IT Application Leadership: Electronic Identification Systems" (Information Technology and Innovation Foundation, September 2011), https://itif.org/publications/2011/09/15/explaining-international-it-application-leadership-electronic-identification.*

Congress should create a robust national standard for data-breach notification.

Congress should establish a uniform federal standard for data-breach notification to extricate consumers from the current patchwork of different state requirements that provide uneven protection. Congress should reject all attempts to simply add an additional layer of regulation that would benefit neither consumers nor industry.

More details: *Daniel Castro and Alan McQuinn, "Why We Need a Robust National Standard for Data Breach Notification," Christian Science Monitor, June 10, 2015, http://www.csmonitor.com/World/Passcode/Passcode-Voices/2015/0610/Opinion-Why-we-need-a-robust-national-standard-for-data-breach-notification.*

Congress should require all federal agencies that discover security flaws to disclose them in a timely and responsible manner, and to work with private industry to fix them.

One of the most serious cybersecurity threats comes from so-called "zero day" attacks, which are designed to exploit vulnerabilities that a developer either doesn't know about or hasn't had time to fix. While most professional security researchers in the private sector and academia adhere to responsible disclosure policies to mitigate the threat from these vulnerabilities, U.S. government agencies do not. Therefore, Congress should pass legislation that directs U.S. government agencies that discover vulnerabilities in software or hardware

products to responsibly notify their developers in a timely manner every time so they can fix the vulnerabilities.

More details: *Daniel Castro and Alan McQuinn, "Unlocking Encryption: Information Security and the Rule of Law" (Information Technology and Innovation Foundation, March 2016), https://itif.org/publications/2016/03/14/unlocking-encryption-information-security-and-rule-law.*

Congress should examine whether U.S. courts can better balance the interests of individuals and the state by allowing law enforcement to hold suspects in contempt of court when they refuse to disclose encryption keys for their secured data.

The Fifth Amendment attempts to balance the rights of individuals and the needs of society. However, encryption offers a unique and significant interest for the state in compelling production of decrypted information, as encrypted information is often impregnable without the key. Achieving a fair balance of interests between citizens and the state requires permitting law enforcement—under lawful court order—to compel someone to turn over a password or encryption key if law enforcement can prove a convincing interest in acquiring that information. Congress should investigate how best to achieve this balance.

More details: *Daniel Castro and Alan McQuinn, "Unlocking Encryption: Information Security and the Rule of Law" (Information Technology and Innovation Foundation, March 2016), https://itif.org/publications/2016/03/14/unlocking-encryption-information-security-and-rule-law.*

Congress should establish an "18F" for cybersecurity.

Congress should direct the General Services Administration (GSA) to establish an office that collaborates with other agencies on cybersecurity issues, bringing in top private-sector talent to improve government security. This team should be modelled off some of the most successful aspects of the existing GSA office known as 18F, but with a focus on cybersecurity. The goal of this initiative would be to incorporate private-sector knowledge and nongovernment culture into high-impact, high-priority federal government cybersecurity projects. Members of this team could serve short-term stints based on new projects, agency needs, and available funding.

More details: *18F, https://18f.gsa.gov.*

Congress should require companies to publish security policies to promote transparency with consumers.

Most companies publish privacy policies, which create a transparent and accountable mechanism for regulators to ensure companies are adhering to their stated policies. But no such practice exists for information security practices, which has resulted in vague standards, regulation by buzzword, and information asymmetry in markets. By publishing security policies, companies would be motivated to describe the types of security measures they have in place rather than just make claims of taking "reasonable security measures." This is a concrete step that policymakers can take to improve security practices in the private sector.

More details: *Daniel Castro, "How Congress Can Fix 'Internet of Things' Security," The Hill, October 28, 2016, http://thehill.com/blogs/pundits-blog/technology/303302-how-congress-can-fix-internet-of-things-security.*

Data Innovation

Congress should codify open-government data requirements.

Opening up government data for public use enables substantial economic and social benefits and can be a valuable tool to reduce fraud, waste, and abuse. However, all open-data requirements for the federal government are the result of executive actions and thus do not carry the weight of the law. Congress should pass the bipartisan Open, Public, Electronic, and Necessary (OPEN) Government Data Act—introduced in the 115th Congress by Sens. Brian Schatz (D-HI) and Ben Sasse (R-NE), and Reps. Derek Kilmer (D-WA) and Blake Farenthold (R-TX), which codifies and improves on these requirements and defines publishing open data as an official responsibility of federal agencies.

More details: *Daniel Castro and Joshua New, "Accelerating Data Innovation: A Legislative Agenda for Congress" (Information Technology and Innovation Foundation, Center for Data Innovation, May 2015), https://www.datainnovation.org/2015/05/accelerating-data-innovation-a-legislative-agenda-for-congress.*

Congress should require financial regulators to adopt modern data standards.

The Security and Exchange Commission (SEC) and other financial regulatory agencies have adopted modern, machine-readable, structured data standards for their corporate-reporting requirements, but still also require outdated and redundant unstructured data formats, which limits the utility of the data for regulators and the financial sector alike. Congress should require all financial regulatory agencies to adopt modern data-reporting standards and abandon outdated, less useful formats.

More details: *Daniel Castro and Joshua New, "Accelerating Data Innovation: A Legislative Agenda for Congress" (Information Technology and Innovation Foundation, Center for Data Innovation, May 2015), https://www.datainnovation.org/2015/05/accelerating-data-innovation-a-legislative-agenda-for-congress.*

Congress should improve the management of geospatial data.

Geospatial data is an important driver of innovation. However, there is poor coordination of geospatial data among federal agencies, so there is no easy way to know what various agencies collect or how they invest in geospatial data infrastructure. This leads agencies to duplicate efforts and waste resources, and it impedes data sharing. Previous coordination efforts have failed to solve the problem. Congress should direct OMB to improve oversight of geospatial data coordination efforts; require agencies to report geospatial data investments in their budget submissions; and encourage local, state, and federal collaboration and data sharing.

More details: *Daniel Castro and Joshua New, "Accelerating Data Innovation: A Legislative Agenda for Congress" (Information Technology and Innovation Foundation, Center for Data Innovation, May 2015), https://www.datainnovation.org/2015/05/accelerating-data-innovation-a-legislative-agenda-for-congress.*

Congress should develop robust data on U.S. coastlines.

Geospatial data on America's 95,000 miles of coastlines is inaccurate and dated, despite its critical importance to the economy, infrastructure planning, disaster response, and the environment. Congress should create a national coastal-mapping information platform that allows the National Oceanic and Atmospheric

Administration (NOAA) and other state and federal agencies to develop accurate geospatial data on coastlines and share this data with each other and the public.

More details: *Daniel Castro and Joshua New, "Accelerating Data Innovation: A Legislative Agenda for Congress" (Information Technology and Innovation Foundation, Center for Data Innovation, May 2015), https://www.datainnovation.org/2015/05/accelerating-data-innovation-a-legislative-agenda-for-congress.*

Congress should require statewide education databases to properly link longitudinal student records.

Most states, as well as the District of Columbia, Puerto Rico, and the Virgin Islands, have received federal grants to develop statewide longitudinal data systems (SLDSs) to collect and analyze student data. These systems can include data about early childhood education, K-12 education, postsecondary education, and workforce information—known collectively as P-20w information. The stated goal of the SLDS program is to create systems that fully link this P-20w data, which could help policymakers make more informed decisions about education policy and labor-market needs. But prior rounds of grant funding have not required states to implement full P-20w linkage. As a result, the completeness and quality of longitudinal student data varies widely by state. In future rounds of SLDS grant funding, Congress should require states to collect and properly link all P-20w data in their systems, and make this data as usable as possible.

More details: *Daniel Castro and Joshua New, "Accelerating Data Innovation: A Legislative Agenda for Congress" (Information Technology and Innovation Foundation, Center for Data Innovation, May 2015), https://www.datainnovation.org/2015/05/accelerating-data-innovation-a-legislative-agenda-for-congress; Joshua New, "Building a Data-Driven Education System in the United States" (Information Technology and Innovation Foundation, Center for Data Innovation, November 2016), https://www.datainnovation.org/2016/11/building-a-data-driven-education-system-in-the-united-states.*

The Department of Education should develop a model data-driven school district.

There are no examples of a truly data-driven education system, even though better use of data has the potential to significantly improve how educators teach children and how administrators manage schools. The Department of Education should provide leadership by launching a challenge to establish a multiyear, fully data-driven school-system pilot that can serve as a model for educators around the country. In coordination with researchers, educators, and education-technology developers, the agency should develop criteria for proposed pilots and provide implementation funding. To participate in the challenge, school districts should commit to making de-identified education data collected in the pilot available to researchers, to making student data easily exportable, and to sharing information about their successes and failures with other school districts that wish to adopt data-driven approaches. Additionally, the district should be required to identify areas where state or federal restrictions on collection and use of data limit its ability to improve education. Finally, the winning district should prioritize projects that can be easily replicated by other school districts.

More details: *Joshua New, "Building a Data-Driven Education System in the United States" (Information Technology and Innovation Foundation, Center for Data Innovation, November 2016), https://www.datainnovation.org/2016/11/building-a-data-driven-education-system-in-the-united-states.*

The White House should establish a national Internet of Things strategy.

The private sector is developing connected technologies to support smart homes, cities, and infrastructure, but these advancements are piecemeal and fragmented. To encourage a more comprehensive, systematic approach to the Internet of Things, the White House should develop a national strategy that spurs public and private adoption of the Internet of Things.

More details: *Daniel Castro and Joshua New, "Accelerating Data Innovation: A Legislative Agenda for Congress" (Information Technology and Innovation Foundation, Center for Data Innovation, May 2015), https://www.datainnovation.org/2015/05/accelerating-data-innovation-a-legislative-agenda-for-congress.*

Congress should direct the Federal CIO Council to establish an IoT taskforce to provide leadership and cross-government coordination to support adoption and deployment of the Internet of Things.

The federal government generally lacks strategic leadership and coordination when it comes to federal adoption and deployment of the Internet of Things (IoT). To remedy this, Congress should direct the Federal Chief Information Officers (CIOs) Council to establish a task force that is responsible for cross-government leadership on this technology. This IoT task force should be charged with educating agency leadership, fostering collaboration across agencies, and developing and sharing best practices for deploying IoT applications. The task force should also identify how to reform procurement policies to better acquire IoT solutions and develop data-skills training programs for federal employees.

More details: *Daniel Castro, Joshua New, and Alan McQuinn, "How Is the Federal Government Using the Internet of Things," Information Technology and Innovation Foundation, Center for Data Innovation, July 25, 2016, https://www.datainnovation.org/2016/07/how-is-the-federal-government-using-the-internet-of-things.*

Congress should direct every federal agency to develop an action plan for how it will use IoT solutions to cut costs and improve services.

Few federal agencies have pursued opportunities to use the Internet of Things to operate more efficiently and effectively. Therefore, Congress should direct all federal agencies to create a strategic plan for how they will adopt and deploy the Internet of Things to cut costs and improve the quality of their respective services. Action plans also should address any unique obstacles agencies face in adopting and using the technology. And the action plans should explain how agencies will improve their operations by leveraging new opportunities presented by the Internet of Things and the data these technologies generate.

More details: *Daniel Castro, Joshua New, and Alan McQuinn, "How Is the Federal Government Using the Internet of Things," Information Technology and Innovation Foundation, Center for Data Innovation, July 25, 2016, https://www.datainnovation.org/2016/07/how-is-the-federal-government-using-the-internet-of-things.*

Congress should direct GSA to establish an "IoT Corps" to work on high-impact IoT projects.

The General Services Administration (GSA) should establish a team of government employees who can be assigned to work on high-impact IoT projects at federal agencies. The goal of this "IoT Corps" would be to develop a strong workforce with the skills to deploy the Internet of Things throughout the federal government. Members of this team could rotate to new assignments every couple of years based on new projects, agency needs, and available funding. This model of government service would build off some of the successful aspects of 18F and the U.S. Digital Service.

More details: *Daniel Castro, Joshua New, and Alan McQuinn, "How Is the Federal Government Using the Internet of Things" (Information Technology and Innovation Foundation, Center for Data Innovation, July 25, 2016), https://www.datainnovation.org/2016/07/how-is-the-federal-government-using-the-internet-of-things.*

Congress should establish a globally competitive smart-cities project.

The United States is missing an opportunity to be a global leader in smart cities—cities that rely on networked sensors and data technologies to drive decision-making and improve municipal services and infrastructure, including transportation, due in part to a lack of federal support or guidance. Congress should establish a smart-city pilot program and funding mechanism to spur the development of comprehensive smart-city services that leverage the Internet of Things.

More details: *Daniel Castro and Joshua New, "Accelerating Data Innovation: A Legislative Agenda for Congress" (Information Technology and Innovation Foundation, Center for Data Innovation, May 2015), https://www.datainnovation.org/2015/05/accelerating-data-innovation-a-legislative-agenda-for-congress.*

OMB should direct federal agencies to allocate preference points for credit and loan applications that propose using smart infrastructure to significantly lower life-cycle project costs.

The Environmental Protection Agency (EPA) water-infrastructure programs, including the State Revolving Fund and the Water Infrastructure Finance and Innovation Act Program, provide credit and loan assistance for local drinking-water and wastewater infrastructure, but lack incentives to use innovative technologies that can deliver significant savings. Agencies should allocate preference points in reviewing applications that seek credit and loan assistance for projects that propose using smart infrastructure to significantly lower life-cycle project costs.

More details: *Robert D. Atkinson, et al., "A Policymaker's Guide to Digital Infrastructure" (Information Technology and Innovation Foundation, May 2016), https://itif.org/publications/2016/05/16/policymakers-guide-digital-infrastructure.*

The president should establish a digital-infrastructure council.

Without proactive public policies, the transition to hybrid and digital infrastructure will take longer than it should. To speed up the process, the president should establish a digital-infrastructure council, made up of key officials from agencies that manage infrastructure, including the departments of Housing and Urban Development, Transportation, Defense, Energy, Interior, the Environmental Protection Agency, and the Federal Energy Regulatory Commission. These officials should meet regularly to discuss how their agencies plan to use digital technologies—such as the Internet of Things, data analytics and artificial intelligence—to improve infrastructures they help manage.

More details: *Robert D. Atkinson, "Build Smarter Infrastructure," U.S. News & World Report, January 9, 2017, https://www.usnews.com/opinion/op-ed/articles/2017-01-09/donald-trumps-infrastructure-plan-should-be-smart-and-digital.*

Congress should establish innovation set-aside mechanisms across grant programs for infrastructure.

At the local level, authorities often find new infrastructure technologies difficult to finance, given that evidence of their impact is still developing. And federal agencies typically lack mechanisms to integrate new technologies into their core infrastructure investments. Innovation set-asides would allow agencies to dedicate

resources alongside their core grant programs—offering flexible funding for experimental new technologies to be deployed and evaluated with major infrastructure projects.

More details: *Robert D. Atkinson, et al., "A Policymaker's Guide to Digital Infrastructure" (Information Technology and Innovation Foundation, May 2016), https://itif.org/publications/2016/05/16/policymakers-guide-digital-infrastructure.*

Internet

Congress should give gig-economy platforms a five-year exemption from labor laws that treat worker benefits as evidence of an employer-employee relationship.

Labor law classifies most gig-economy workers as independent contractors. Platform providers and workers say this distinction is necessary for workers to have the flexibility they want. But if platform providers want to give workers benefits such as tax withholding, training, health insurance, or pensions, they risk having contractors reclassified as regular employees. Waiving this risk for five years would give companies a chance to set up programs for workers without fear of lawsuits. If companies establish such programs, then Congress could make the exemption permanent or extend it to other alternative work arrangements. If not, then Congress could allow the exemption to expire automatically.

More details: *Joe Kennedy, "Three Paths to Update Labor Law for the Gig Economy" (Information Technology and Innovation Foundation, April 2016), https://itif.org/publications/2016/04/18/three-paths-update-labor-law-gig-economy.*

Congress should establish a single, national license for telehealth providers.

Complex state licensing requirements prevent health-care providers licensed in one state from providing telehealth services in another. To address this challenge and further enhance development of telehealth services, Congress should establish a single, national license for telehealth providers. For those concerned about infringing on states' rights, the legislation could have a sunset provision if states later create a multistate compact adopting a nationwide licensing standard.

More details: *Daniel Castro, Ben Miller, and Adams Nager, "Unlocking the Potential of Physician-to-Patient Telehealth Services" (Information Technology and Innovation Foundation, May 2014), https://itif.org/publications/2014/05/12/unlocking-potential-physician-patient-telehealth-services.*

Congress should pass anti-SLAPP legislation to protect public speech online.

Congress should pass federal legislation to reduce strategic lawsuits against public participation (known as SLAPPs) by creating a baseline level of protection for citizens' rights of petition and free expression. A SLAPP effectively censors public speech by invoking the court system to intimidate critics. By enacting legislation, the federal government can both protect the rights of individuals and enable e-commerce to flourish.

More details: *Daniel Castro and Laura Drees, "Why We Need Federal Legislation to Protect Public Speech Online" (Information Technology and Innovation Foundation, May 2015), https://itif.org/publications/2015/05/04/why-we-need-federal-legislation-protect-public-speech-online.*

Privacy

Congress should reform the Electronic Communications Privacy Act to ensure citizens have a right to privacy for electronic data whether it is stored on a device or remotely in the cloud.

The Electronic Communications Privacy Act (ECPA) was enacted in 1986 and has not kept pace with the advancement of technology. For example, there are different levels of protection afforded to the privacy of an individual's data based on where the data is stored and how long the data has been stored. Where possible, the privacy of an individual's communication should be the same regardless of the type of technology used to facilitate the communication.

More details: *Robert D. Atkinson et al., "Winning the Race 2012 Memos" (Information Technology and Innovation Foundation, September 2012), https://itif.org/publications/2012/09/05/winning-race-2012-memos.*

The administration should engage with U.S. trade partners to create a "Geneva Convention on the Status of Data."

The United States should engage with its trade partners to establish international legal standards for government access to data through a "Geneva Convention on the Status of Data." This would create a multilateral agreement establishing international rules for transparency, settling questions of jurisdiction, producing better coordination of international law-enforcement requests, and limiting unnecessary access by governments to the data on citizens of other countries. Only by working to establish a global pact can countries hold each other accountable on these issues in the future.

More details: *Daniel Castro and Alan McQuinn, "Beyond the USA Freedom Act: How U.S. Surveillance Still Subverts U.S. Competitiveness" (Information Technology and Innovation Foundation, June 2015), https://itif.org/publications/2015/06/09/beyond-usa-freedom-act-how-us-surveillance-still-subverts-us-competitiveness.*

Congress should combat "revenge porn" by: 1) Passing legislation to criminalize nonconsensual distribution of sexually explicit images; 2) Creating a special FBI unit to assist victims of nonconsensual pornography; and, 3) Directing the Department of Justice to work with the private sector on best practices for online services to quickly remove nonconsensual pornography.

The distribution of sexually explicit images without a subject's consent, commonly referred to as "revenge porn," exists in a legal gray area in much of the country, such that victims have few options for recourse, and perpetrators go unpunished. To reverse this trend, Congress should pass legislation that makes revenge porn a federal crime. Congress also should create a special unit in the Federal Bureau of Investigations to assist victims of nonconsensual pornography and pursue the worst offenders, since local law-enforcement officials are often unprepared to respond swiftly. Finally, Congress should direct the Department of Justice to partner with the private sector to identify and disseminate best practices for addressing this problem.

More details: *Daniel Castro and Alan McQuinn, "Why and How Congress Should Outlaw Revenge Porn" (Information Technology and Innovation Foundation, July 2015), https://itif.org/publications/2015/07/15/why-and-how-congress-should-outlaw-revenge-porn.*

Transportation

Congress should prioritize intelligent-transportation systems by adopting a new "cement and chips" approach to infrastructure funding.

Intelligent transportation systems (ITS)—the application of information and communications technologies to bring actionable, real-time intelligence to every actor and asset in a transportation network—deliver a cost-benefit ratio at least nine times higher than traditional highway-infrastructure investments. Congress should prioritize ITS deployments in surface-transportation reauthorization bills by devoting no less than 5 percent of Highway Trust Funds allocated to states to support digital and ITS-based infrastructure projects.

More details: *Stephen J. Ezell and Robert D. Atkinson, "From Concrete to Chips: Bringing the Surface Transportation Reauthorization Act Into the Digital Age" (Information Technology and Innovation Foundation, May 2015), https://itif.org/publications/2015/05/19/concrete-chips-bringing-surface-transportation-reauthorization-act-digital.*

Congress should encourage deployment of intelligent systems by requiring the Transportation Department to provide incentives through the federal highway program for states to adopt tolling.

Tolling can play a key role in generating the funding to pay for expanded, more efficient roadway capacity. But too many states do not want to support toll-funded projects because they fear public opposition, despite the fact that the public usually supports toll projects that are introduced. Lowering the share of federal funding for non-toll projects from the current 80 percent share to 60 percent, while funding the full 80 percent for toll projects, would provide a stronger incentive for states to establish more toll projects.

More details: *Stephen J. Ezell and Robert D. Atkinson, "From Concrete to Chips: Bringing the Surface Transportation Reauthorization Act Into the Digital Age" (Information Technology and Innovation Foundation, May 2015), https://itif.org/publications/2015/05/19/concrete-chips-bringing-surface-transportation-reauthorization-act-digital.*

BROADBAND TELECOMMUNICATIONS

Congress should continue expanding the Spectrum Relocation Fund.

The proliferation of wireless broadband has been a boon to the U.S. economy. But more spectrum is needed, and the time is ripe to improve mechanisms to repurpose existing spectrum allocations. To that end, Congress should continue expanding the Spectrum Relocation Fund to fund relocation studies, general planning of relocation and/or sharing, and research into new, more efficient equipment for federal spectrum users. A part of this expansion should include consideration of mechanisms to allow for more direct upgrade of legacy federal radio systems such that private companies can assist in freeing up federal spectrum.

More details: *Robert D. Atkinson and Doug Brake (Comments to the House Energy and Commerce Committee on Communications Act Update, April 25, 2014), https://itif.org/publications/2014/04/25/communications-act-update-should-continue-liberalize-spectrum-management; Doug Brake, "5G and Next Generation Wireless: Implications for Policy and Competition" (Information Technology and Innovation Foundation, June 2016), https://itif.org/publications/2016/06/30/5g-and-next-generation-wireless-implications-policy-and-competition.*

Congress should build upon the spectrum pipeline.

Spectrum is a key input to important general-purpose technologies such as mobile broadband and the Internet of Things. To best leverage their potential, Congress should work with the National Telecommunications and Information Administration to develop a long-term pipeline of spectrum to be repurposed for wireless broadband. This spectrum should include a mix of both licensed and unlicensed use.

More details: *Robert D. Atkinson and Doug Brake (Comments to the House Energy and Commerce Committee on Communications Act Update, April 25, 2014), https://itif.org/publications/2014/04/25/communications-act-update-should-continue-liberalize-spectrum-management; Doug Brake, "5G and Next Generation Wireless: Implications for Policy and Competition" (Information Technology and Innovation Foundation, June 2016), https://itif.org/publications/2016/06/30/5g-and-next-generation-wireless-implications-policy-and-competition.*

Congress should reform the FCC's merger review process.

The Federal Communications Commission (FCC) reviews telecommunications mergers under the notoriously squishy public-interest standard, leading to an unpredictable process and, occasionally, the appearance of transactional conditions drawn out of merging parties. Congress should add more specificity to the public-interest standard in the context of merger review. That specificity should include a requirement that the FCC evaluate a merger's impact on dynamic innovation.

More details: *Robert D. Atkinson, "The Role of Competition in a National Broadband Policy" (Information Technology and Innovation Foundation, October 2007), https://itif.org/publications/2009/03/16/role-competition-national-broadband-policy.*

Congress should help lower the cost of deploying broadband

Policies that promote the efficient deployment of infrastructure, such as "dig once" requirements that would install conduit along highways during federally funded roadwork, can go a long way in reducing the high cost of deploying broadband infrastructure. But Congress could go further by making receipt of federal infrastructure funds by localities contingent on adopting a model municipal code that would streamline access to rights of way and municipal infrastructure such as utility or light poles.

More details: *Doug Brake and Robert D. Atkinson, (Comments to Agriculture and Commerce Departments on Broadband Opportunity Council Policy Reforms, June 2015), https://itif.org/publications/2015/06/10/itif-advises-broadband-opportunity-council-focus-low-hanging-broadband-fruit.*

TRADE AND GLOBALIZATION

Congress should update the charter of the Committee on Foreign Investment in the United States and give it more resources to address the realities of modern state capitalism.

The Committee on Foreign Investment in the United States (CFIUS) reviews the potential impact of transactions that give foreign entities control of U.S. businesses. Examiners currently review covered transactions on a case-by-case basis. But Congress should update the CFIUS charter to address the systemic threats posed by modern, state-led capitalism—particularly in the context of state-owned enterprises. Examiners should assess transactions in the broader context of their impact on the whole U.S. defense and industrial base. Congress also should give CFIUS reviewers more time and resources.

More details: *Stephen Ezell and Robert D. Atkinson, "Fifty Ways to Leave Your Competitiveness Woes Behind: A National Traded Sector Competitiveness Strategy" (Information Technology and Innovation Foundation, September 2012), https://itif.org/publications/2012/09/20/fifty-ways-leave-your-competitiveness-woes-behind-national-traded-sector.*

Congress should create an Office of Competitiveness within USTR.

The U.S. Trade Representative (USTR) too often fights tariff or trade agreement wars of the past. It is not set up, either institutionally or philosophically, to fight the current war against rampant innovation mercantilism fueled by nontariff barriers, intellectual-property coercion and theft, and discriminatory industrial policies. To address this, Congress should create an Office of Competitiveness within USTR to identify foreign government policies and practices that do not necessarily violate World Trade Organization (WTO) rules but clearly hurt U.S. commerce. Similar to the State Department's Office of Policy Planning, it should be charged with focusing on U.S. trade policy in the context of globalization and competitiveness.

More details: *Robert D. Atkinson, Nigel Cory, and Stephen Ezell, "Stopping China's Mercantilism: A Doctrine of Constructive, Alliance-Backed Confrontation" (Information Technology and Innovation Foundation, March 2017), https://itif.org/publications/2017/03/16/stopping-chinas-mercantilism-doctrine-constructive-alliance-backed.*

Congress should empower the U.S. International Trade Commission to investigate and issue "trade enforcement advisory opinions."

Congress should empower the U.S. International Trade Commission (ITC) to investigate and issue reports on allegations of trade violations that U.S. companies claim are happening with trading partners, such as China. This could be done by expanding Section 332 of the Tariff Act of 1930. These ITC reports, in the form of a "trade advisory opinion," would provide a valuable middle option along the spectrum—with bilateral talks at one end and WTO dispute cases at the other, thus shedding light on whether U.S. trade partners are violating trade rules and whether such a case is credible and worthy of a potential complaint at the WTO or under bilateral free trade agreements.

More details: *Robert D. Atkinson, Nigel Cory, and Stephen Ezell, "Stopping China's Mercantilism: A Doctrine of Constructive, Alliance-Backed Confrontation" (Information Technology and Innovation Foundation, March 2017), https://itif.org/publications/2017/03/16/stopping-chinas-mercantilism-doctrine-constructive-alliance-backed.*

Congress should pass legislation that allows U.S. firms to ask the Justice Department for an antitrust exemption to coordinate actions regarding technology transfer and investment in other nations.

A key feature of China's mercantilist strategy is that China is essentially a monopsonist: The Chinese marketplace is such a large prize that its gatekeepers can take advantage of the competitive pressures foreign companies face by compelling them to hand over technology as a condition of doing business in the country. But if companies in a similar industry can agree that none of them will transfer their technologies to China in order to gain market access, then the Chinese government will have much less leverage. Permitting this type of coordination would be similar to the 1984 Cooperative R&D Act, which let firms apply to form precompetitive R&D consortia.

More details: *Robert D. Atkinson, Nigel Cory, and Stephen Ezell, "Stopping China's Mercantilism: A Doctrine of Constructive, Alliance-Backed Confrontation" (Information Technology and Innovation Foundation, March 2017), https://itif.org/publications/2017/03/16/stopping-chinas-mercantilism-doctrine-constructive-alliance-backed.*

Congress should prevent foreign governments from abusing America's "foreign sovereign compulsion" defense for mercantilist ends.

China and other countries in recent years have abused the doctrine of "foreign sovereign compulsion" to justify anticompetitive behavior that has harmed U.S. interests even though it has passed muster in U.S. courts. For instance, the U.S. Second Court of Federal Appeals in 2016 threw out a case against Chinese vitamin C makers alleged to have conspired to fix prices and limit supplies in international markets, including in the United States, on grounds that the behavior was directed by the Chinese government and thus wasn't actionable under U.S. antitrust law because deference must be given to the official policies of foreign governments (i.e., the foreign sovereign compulsion defense). It's time for Congress to curb foreign governments' ability to abuse the foreign sovereign compulsion defense for these kinds of mercantilist ends. One way to do so would be to require courts to give consideration to the implications for U.S. industries' global competitiveness in cases involving the foreign sovereign compulsion defense.

More details: *Robert D. Atkinson, Nigel Cory, and Stephen Ezell, "Stopping China's Mercantilism: A Doctrine of Constructive, Alliance-Backed Confrontation" (Information Technology and Innovation Foundation, March 2017), https://itif.org/publications/2017/03/16/stopping-chinas-mercantilism-doctrine-constructive-alliance-backed.*

Congress should call on USTR to produce an annual Global Mercantilist Index that comprehensively documents and ranks trade barriers imposed by America's trading partners.

USTR's Special 301 Report provides an annual review of countries that maintain inadequate intellectual-property protections and enforcement mechanisms, and its National Trade Estimate Report on Foreign Trade Barriers (NTE) provides an effective inventory of significant foreign barriers to U.S. exports and investment. But America lacks a consolidated report that comprehensively identifies all of the innovation-mercantilist policies of America's trading partners and ranks the worst offenders.

More details: *Michelle Wein, Stephen Ezell, and Robert D. Atkinson, "The Global Mercantilist Index: A New Approach to Ranking Nations' Trade Policies" (Information Technology and Innovation Foundation, October 2014), https://itif.org/publications/2014/10/08/global-mercantilist-index-new-approach-ranking-nations-trade-policies.*

Congress should increase the resources available for USTR, the Interagency Trade Enforcement Center, and the International Trade Administration to negotiate new trade agreements and bolster enforcement activities.

USTR and the Interagency Trade Enforcement Center (ITEC) are under-resourced, so they lack the capacity to think strategically about the implications of foreign economic and trade policies, and they can't pursue trade-enforcement activities as vigorously as is necessary to counter new forms of protectionism. Congress should increase USTR funding to match the administrations' FY 2015 budget request of $56 million and fund ITEC and the International Trade Administration (ITA) at the levels proposed in the administration's FY 2016 budget request.

More details: *Robert D. Atkinson, Nigel Cory, and Stephen Ezell, "Stopping China's Mercantilism: A Doctrine of Constructive, Alliance-Backed Confrontation" (Information Technology and Innovation Foundation, March 2017), https://itif.org/publications/2017/03/16/stopping-chinas-mercantilism-doctrine-constructive-alliance-backed.*

CLEAN-ENERGY INNOVATION

Congress should reform tax incentives for low-carbon energy to make them permanent and technology-neutral, and to phase out support for each generation of technology as it matures.

Tax incentives are important mechanisms for sharing risk with private investors in the early deployment phase of energy-technology innovation. Many current incentives, however, are insensitive to technological maturity. They remain fixed, even after the technologies to which they apply are no longer risky. Such incentives have become subsidies that deter, rather than support, innovation. Congress should establish a permanent system of incentives that supports all promising immature technologies, but methodically steps down the incentive as each technology matures. Decisions about which versions of which technologies should qualify for which rate should be delegated to an appropriate expert body.

More details: *David M. Hart, "Rescuing the Low-Carbon Energy Transition From Magical Thinking" (Information Technology and Innovation Foundation, October 2016), https://itif.org/publications/2016/10/27/rescuing-low-carbon-energy-transition-magical-thinking.*

The White House should tighten energy-efficiency and carbon-control regulations in a predictable, innovation-inducing manner.

Federal regulations on appliances, vehicles, power plants, and industrial facilities (as well as state and local building codes supported by federal technical assistance) prevent significant greenhouse-gas emissions. Although they often cost less than anticipated, they are sometimes overly ambitious and even counterproductive. OMB should establish a best practice among federal agencies in which regulatory agency staff engage with industrial experts to set aggressive but feasible targets in a time frame that allows industry to plan ahead. Long-term targets provide a focus for industrial investments in innovation as well as opportunities to make adjustments if the hoped-for results do not emerge in the expected time frame.

More details: *David M. Hart, "Rescuing the Low-Carbon Energy Transition From Magical Thinking" (Information Technology and Innovation Foundation, October 2016), https://itif.org/publications/2016/10/27/rescuing-low-carbon-energy-transition-magical-thinking.*