

NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY
REAUTHORIZATION ACT OF 2018

SEPTEMBER 25, 2018.—Committed to the Committee of the Whole House on the
State of the Union and ordered to be printed

Mr. SMITH of Texas, from the Committee on Science, Space, and
Technology, submitted the following

R E P O R T

[To accompany H.R. 6229]

[Including cost estimate of the Congressional Budget Office]

The Committee on Science, Space, and Technology, to whom was referred the bill (H.R. 6229) to authorize the programs of the National Institute of Standards and Technology, and for other purposes, having considered the same, report favorably thereon with an amendment and recommend that the bill as amended do pass.

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The amendment is as follows:

Strike all after the enacting clause and insert the following:

SECTION 1. SHORT TITLE.

This Act may be cited as the “National Institute of Standards and Technology Reauthorization Act of 2018”.

SEC. 2. AUTHORIZATION OF APPROPRIATIONS.**(a) FISCAL YEAR 2018.—**

(1) **IN GENERAL.**—There are authorized to be appropriated to the Secretary of Commerce \$1,198,500,000 for the National Institute of Standards and Technology for fiscal year 2018.

(2) **SPECIFIC ALLOCATIONS.**—Of the amount authorized by paragraph (1)—

(A) \$724,500,000 shall be for scientific and technical research and services laboratory activities;

(B) \$319,000,000 shall be for the construction and maintenance of facilities; and

(C) \$155,000,000 shall be for industrial technology services activities.

(b) FISCAL YEAR 2019.—

(1) **IN GENERAL.**—There are authorized to be appropriated to the Secretary of Commerce \$1,125,000,000 for the National Institute of Standards and Technology for fiscal year 2019.

(2) **SPECIFIC ALLOCATIONS.**—Of the amount authorized by paragraph (1)—

(A) \$850,000,000 shall be for scientific and technical research and services laboratory activities, of which—

(i) \$109,900,000 shall be for the advanced communications, networks, and scientific data systems mission area;

(ii) \$103,200,000 shall be for the cybersecurity and privacy mission area;

(iii) \$234,000,000 shall be for the fundamental measurement, quantum science and measurement dissemination mission area; and

(iv) \$89,800,000 shall be for the physical infrastructure and resilience mission area;

(B) \$120,000,000 shall be for the construction and maintenance of facilities; and

(C) \$155,000,000 shall be for industrial technology services activities.

SEC. 3. QUANTUM INFORMATION SCIENCE.

(a) RESEARCH ACTIVITIES AND ENGAGEMENT.—The Secretary, acting through the Director, shall—

(1) continue to support and expand basic quantum information science and technology research and development of measurement and standards infrastructure necessary to advance commercial development of quantum applications;

(2) use the programs of the Institute, in collaboration with other relevant Federal agencies, as appropriate, to train scientists in quantum information science and technology to increase participation in the quantum fields;

(3) establish or expand collaborative ventures or consortia with other public or private sector entities, including other Federal agencies engaged in quantum information science research and development, institutions of higher education, National Laboratories, and industry, for the purpose of advancing the field of quantum information science and engineering; and

(4) have the authority to enter into and perform such contracts on such terms as the Secretary, acting through the Director, considers appropriate, including cooperative research and development arrangements and grants and cooperative agreements or other transactions, as may be necessary in the conduct of the work of the Institute with respect to quantum information science and technology.

(b) QUANTUM WORKSHOP.—

(1) **IN GENERAL.**—Not later than 1 year after the date of the enactment of this Act, the Secretary, acting through the Director, shall convene a workshop of stakeholders to discuss the future measurement, standards, cybersecurity, and other issues that relate to development of quantum information science in the United States. The goals of the workshop shall be—

(A) assessment of the Institute's quantum information science and technology research work, including areas that may need additional Institute investment in order to support development of quantum information science and technology in the United States; and

(B) consideration of recommendations and priority issues for the Institute's participation in the proposed National Quantum Initiative Program.

(2) **REPORT TO CONGRESS.**—Not later than 2 years after the date of enactment of this Act, the Secretary, acting through the Director, shall transmit to the Committee on Science, Space, and Technology and the Committee on Appropriations of the House of Representatives and the Committee on Commerce, Science, and Transportation and the Committee on Appropriations of the Senate a summary report containing the findings of the workshop convened under this subsection.

(c) **FUNDING.**—The Secretary of Commerce shall devote \$80,000,000 to carry out this section for fiscal year 2019, subject to the availability of appropriations, to come from amounts made available pursuant to section 2(b)(2)(A)(iii) of this Act. This section shall be carried out using funds otherwise appropriated by law after the date of enactment of this Act.

SEC. 4. CYBERSECURITY.

(a) **ASSISTANCE TO FEDERAL AGENCIES.**—The Secretary, acting through the Director, shall enhance and expand the Institute’s guidance and assistance to Federal agencies to help such agencies effectively use the Framework, including by providing technical guidance and education and training of—

(1) agency staff responsible for cybersecurity; and

(2) individual inspectors general and staff of such agencies who are responsible for the annual independent evaluation required under section 3555 of title 44, United States Code.

(b) **REPORT.**—Not later than 12 months after the date of the enactment of this Act, the Secretary shall submit to the Committee on Science, Space, and Technology of the House of Representatives and the Committee on Commerce, Science, and Transportation of the Senate a report describing the implementation of the activities described in this section in as much detail as possible, including the identification of Federal agencies assisted pursuant to subsection (a) and the types of consultative services, education, guidance, assistance, and training provided to such agencies and inspectors general of such agencies pursuant to such subsection.

(c) **RESEARCH.**—The Secretary, acting through the Director, shall expand the fundamental and applied research carried out by the Institute to address key questions relating the measurement of privacy, security, and vulnerability of software tools and communications networks, including through—

(1) the development of research and engineering capabilities to provide practical solutions, including measurement techniques and engineering toolkits, to solve cybersecurity challenges such as human factors, identity management, network security, privacy, and software;

(2) investment in tools to help private and public sector organizations measure their cybersecurity, manage their risks and ensure workforce preparedness for new cybersecurity challenges; and

(3) investment in programs to prepare the United States with strong cybersecurity and encryption technologies to apply to emerging technologies such as artificial intelligence, the internet of things, and quantum computing.

(d) **AUTHORITY.**—The Secretary, acting through the Director, shall have the authority to enter into and perform such contracts on such terms as the Secretary considers to be appropriate, including cooperative research and development arrangements, grants, and cooperative agreements or other transactions, as may be necessary in the conduct of the work of the Institute with respect to cybersecurity.

SEC. 5. COMPOSITES RESEARCH.

(a) **RESEARCH.**—The Secretary, acting through the Director, shall implement the recommendations contained in the December 2017 report entitled “Road Mapping Workshop Report on Overcoming Barriers to Adoption of Composites in Sustainable Infrastructure”, as appropriate, to help facilitate the adoption of composite technology in infrastructure in the United States. In implementing such recommendations, the Secretary, acting through the Director shall, with respect to the use of composite technology in infrastructure—

(1) not later than 6 months after the date of enactment of this Act, establish a design data clearinghouse to identify, gather, validate, and disseminate existing design criteria, tools, guidelines, and standards; and

(2) develop methods and resources required for testing an evaluation of safe and appropriate uses of composite materials for infrastructure, including—

(A) conditioning protocols, procedures and models;

(B) screening and acceptance tools; and

(C) minimum allowable design data sets that can be converted into design tools.

(b) **STANDARDS COORDINATION.**—The Secretary, acting through the Director, shall assure that the appropriate Institute staff consult regularly with standards developers, members of the composites industry, institutions of higher education, and other stakeholders in order to facilitate the adoption of standards for use of composite materials in infrastructure that are based on the research and testing results and other information developed by the Institute.

(c) **FUNDING.**—The Secretary of Commerce shall devote \$11,000,000 to carry out this section for fiscal year 2019, subject to the availability of appropriations, to come from amounts made available pursuant to section 2(b)(2)(A)(iv) of this Act. This sec-

tion shall be carried out using funds otherwise appropriated by law after the date of enactment of this Act.

SEC. 6. ARTIFICIAL INTELLIGENCE AND DATA SCIENCE.

The Secretary, acting through the Director, shall continue to support the development of artificial intelligence and data science, including through—

- (1) the expansion of the Institute’s capabilities, including scientific staff and research infrastructure;
- (2) the implementation of rigorous scientific testing to support the development of trustworthy and safe artificial intelligence and data systems; and
- (3) the development of machine learning and other artificial intelligence applications to support measurement science research programs and take steps to modernize the Institute’s research infrastructure.

SEC. 7. INTERNET OF THINGS.

The Secretary, acting through the Director, shall continue to conduct research with respect to and support the expanded connectivity, interoperability, and security of interconnected systems and other aspects of the internet of things, including through—

- (1) the development of new tools and methodologies for cybersecurity of the internet of things;
- (2) the development of technologies to address network congestion and device interference, such as the development of testing tools for next generation wireless communications, internet of things protocols, coexistence of wireless communications systems, and spectrum sharing;
- (3) convening experts in the public and private sectors to develop recommendations for accelerating the adoption of sound interoperability standards, guidelines, and best practices for the internet of things; and
- (4) the development and publication of new cybersecurity tools, encryption methods, and best practices for internet of things security.

SEC. 8. HIRING AND MANAGEMENT.

(a) **APPOINTMENTS.**—The Secretary, acting through the Director shall have the authority to—

- (1) make appointments of scientific, engineering, and professional personnel without regard to the civil service laws as the Secretary, acting through the Director determines necessary for carrying out research and development functions which require the services of specially qualified personnel relating to cybersecurity and quantum information science and technology and such other areas of national research priorities as the Secretary, acting through the Director may determine; and
- (2) fix the basic pay of such personnel at a rate to be determined by the Secretary, acting through the Director at rates not in excess of the basic rate of pay of the Vice President under section 104 of title 3, United States Code, without regard to the civil service laws.

(b) **LIMITATION.**—The Director may appoint not more than 10 individuals under this section.

SEC. 9. DEFINITIONS.

In this Act:

- (1) The term “Director” means the Director of the National Institute of Standards and Technology.
- (2) The term “Framework” means the Framework for Improving Critical Infrastructure Cybersecurity developed by the National Institute of Standards and Technology and referred to in Executive Order 13800 issued on May 11, 2017 (82 Fed. Reg. 22391 et seq.).
- (3) The term “Institute” means the National Institute of Standards and Technology.
- (4) The term “institution of higher education” has the meaning given such term in section 101 of the Higher Education Act of 1965 (20 U.S.C. 1001).
- (5) The term “Secretary” means the Secretary of Commerce.

COMMITTEE STATEMENT AND VIEWS

PURPOSE AND SUMMARY

H.R. 6229, the “National Institute of Standards and Technology Reauthorization Act of 2018,” was introduced by Subcommittee on Research and Technology Chairwoman Barbara Comstock and sponsored by Subcommittee Ranking Minority Member Daniel

Lipinski. The purpose of H.R. 6229 is to reauthorize, strengthen and prioritize the programs of the National Institute of Standards and Technology (NIST). This legislation includes strategic investments in emerging technology areas in order to ensure U.S. innovation leadership in quantum science, artificial intelligence and big-data science, cybersecurity, the Internet of Things and sustainable infrastructure. This legislation also provides for NIST to expand its fundamental and applied cybersecurity research to address key questions relating to measurement of privacy, security, and vulnerability of software tools and communication networks.

BACKGROUND AND NEED FOR LEGISLATION

NIST was originally founded in 1901 as the National Bureau of Standards. A non-regulatory agency within the Department of Commerce, NIST works to promote U.S. innovation and American competitiveness by advancing measurement science, standards, and technology. Through basic research, NIST sets standards and facilitates the implementation and use of technologies. By working closely alongside industry, NIST has become recognized as a provider of high-quality information utilized by the private sector.

NIST operates two main research laboratories in Gaithersburg, Maryland, and Boulder, Colorado where it employs more than 3,000 scientists, engineers, technicians, and support personnel. In addition, NIST hosts about 3,500 associates and facility users from industry, academia, and other government agencies each year. At these locations, NIST laboratories conduct research that advances the nation's technology infrastructure and helps U.S. companies continually improve products and services.

In 2007, Congress passed, and the President signed into law, the America Creating Opportunities to Meaningfully Promote Excellence in Technology, Education, and Science (America COMPETES) Act (P.L. 110-60), which was based on President George W. Bush's American Competitiveness Initiative (ACI). The centerpiece of the ACI was the prioritization of basic research in the physical sciences and engineering. Physical sciences research develops and advances knowledge and technologies that are used by scientists in nearly every other field. The ACI called for strengthening Federal investments in these areas by reallocating existing Federal resources to three innovation-enabling basic research agencies: National Science Foundation (NSF), Department of Energy Office of Science (DOE SC), and NIST core lab research and facilities.

In 2010, Congress passed, and the President signed into law, the America COMPETES Reauthorization Act of 2010 (P.L. 111-358). This authorization expired at the end of 2014, thereby necessitating a reauthorization of NIST.

Under the Federal Information Security Modernization Act (FISMA), Congress charged NIST with creating and maintaining responsible cybersecurity standards for federal agencies to follow. NIST continues to do an excellent job in carrying out this mission. Its cybersecurity technical standards and risk management framework are widely regarded as among the best and most comprehensive in the world.

Through the years, this Committee has seen an increase in the sophistication and frequency of cyberattacks on the U.S. Government by nation-states and nefarious cyber actors. Scarcely a month

goes by without news that cyber-criminals have successfully breached federal computer systems and made off with huge treasure troves of sensitive government information and millions of Americans' personally identifiable information.

On May 11, 2017, President Trump took concrete, positive steps by issuing Executive Order 13800, Strengthening the Cybersecurity of Federal Networks and Critical Infrastructure. E.O. 13800 mandates the use of the highest standard of cybersecurity risk management by requiring the federal government to adopt NIST's Framework for Improving Critical Infrastructure Cybersecurity. However, in spite of these early administrative intercessions by the current administration, cybersecurity incidents are likely to continue if agencies remain out of compliance with statutory requirements to meet minimum cybersecurity, technical, and risk-management standards.

LEGISLATIVE HISTORY

On February 14, 2017, the Research and Technology Subcommittee of the House Committee on Science, Space, and Technology held a hearing entitled, "Strengthening U.S. Cybersecurity Capabilities." Witnesses were: Dr. Charles H. Romine, Director, Information Technology Lab, National Institute of Standards and Technology; Mr. Iain Mulholland, Industry Member, CSIS Cyber Policy Task Force, and Chief Technology Officer, Security, VMware, Inc.; Dr. Diana Burley, Executive Director and Chair, Institute for Information Infrastructure Protection (I3P), and Professor, Human and Organizational Learning, The George Washington University; and Mr. Gregory Wilshusen, Director, Information Security Issues, U.S. Government Accountability Office.

On June 15, 2017, the Research and Technology and the Oversight Subcommittees of the House Committee on Science, Space, and Technology held a hearing entitled "Bolstering the Government's Cybersecurity: Lessons Learned from WannaCry." Witnesses were: Mr. Salim Neino, Chief Executive Officer, Kryptos Logic; Dr. Charles H. Romine, Director, Information Technology Laboratory, National Institute of Standards and Technology; Mr. Gregory J. Touhill, CISSP, CISM, Brigadier General, USAF (ret.), and Adjunct Professor, Cybersecurity & Risk Management, Carnegie Mellon University, Heinz College; and Dr. Hugh Thompson, Chief Technology Officer, Symantec.

On June 28, 2017, the Research and Technology and the Energy Subcommittees of the House Committee on Science, Space, and Technology held a hearing entitled, "Materials Science: Building the Future." Witnesses were: Dr. Matthew Tirrell, Deputy Laboratory Director for Science and Chief Research Officer, Argonne National Laboratory; Dr. Laurie Locascio, Acting Associate Director for Laboratory Programs and Director, Material Measurement Laboratory, National Institute of Standards and Technology; Dr. Adam Schwartz, Director, Ames Laboratory; and Dr. Fred Higgs, John and Ann Doerr Professor of Mechanical Engineering, Rice University.

On October 24, 2017, the Research and Technology and the Energy Subcommittees of the House Committee on Science, Space, and Technology held a hearing entitled, "American Leadership in Quantum Technology." Witnesses were: Dr. Carl J. Williams, Act-

ing Director, Physical Measurement Laboratory, National Institute of Standards and Technology; Dr. Jim Kurose, Assistant Director, Computer and Information Science and Engineering Directorate, National Science Foundation; Dr. John Stephen Binkley, Acting Director of Science, U.S. Department of Energy; Dr. Scott Crowder, Vice President and Chief Technology Officer for Quantum Computing, IBM Systems Group; Dr. Christopher Monroe, Distinguished University Professor & Bice Zorn Professor, Department of Physics, University of Maryland, and Founder and Chief Scientist, IonQ, Inc.; and Dr. Supratik Guha, Director, Nanoscience and Technology Division, Argonne National Laboratory, Professor, Institute for Molecular Engineering, University of Chicago.

On October 25, 2017, the Oversight Subcommittee of the House Committee on Science, Space, and Technology held a hearing entitled, “Bolstering the Government’s Cybersecurity: Assessing the Risk of Kaspersky Lab Products to the Federal Government.” Witnesses were: Ms. Donna Dodson, Associate Director and Chief Cybersecurity Advisor, Information Technology Laboratory and Chief Cybersecurity Advisor, National Institute of Standards and Technology; Mr. David Shive, Chief Information Officer, U.S. General Services Administration; Mr. James Norton, President, Play-Action Strategies LLC and Adjunct Professor, Johns Hopkins University; and Mr. Sean Kanuck, Director of Future Conflict and Cyber Security, International Institute for Strategic Studies.

On December 13, 2017, the Research and Technology Subcommittee of the House Committee on Science, Space, and Technology held a hearing entitled, “Head Health Challenge: Preventing Head Trauma from Football Field to Shop Floor to Battlefield.” The purpose of the hearing was to review this science prize competition and its goal of spurring the development of advanced materials that will improve the performance of protective equipment. Witnesses were: Dr. Michael Fasolka, Acting Director, Material Measurement Lab, National Institute of Standards and Technology; Mr. Scott A. Kepschull, Vice President and Technical Director, Dynamic Research, Inc.; Dr. Alex O. Dehgan, Chief Executive Officer and Founder, Conservation X Labs; and Mr. Shawn Springs, Chief Executive Officer, Windpact.

On February 14, 2018, the Oversight and Research and Technology Subcommittees of the House Committee on Science, Space, and Technology held a hearing entitled, “Beyond Bitcoin: Emerging Applications for Blockchain Technology.” The purpose of this hearing was to explore the science of blockchain technology and its potential and emerging applications beyond cryptocurrency and financial technology. Witnesses were: Mr. Chris A. Jaikaran, Analyst in Cybersecurity Policy, Government and Finance Division, Congressional Research Service; Dr. Charles H. Romine, Director, Information Technology Laboratory, National Institute of Standards and Technology; Mr. Gennaro “Jerry” Cuomo, IBM Fellow, Vice President Blockchain Technologies, IBM Cloud; Mr. Frank Yiannas, Vice President of Food Safety, Walmart; and Mr. Aaron Wright, Associate Clinical Professor and Co-Director of the Blockchain Project, Benjamin N. Cardozo School of Law.

On April 18, 2018, the Research and Technology Subcommittee of the House Committee on Science, Space, and Technology held a hearing entitled, “Composite Materials—Strengthening Infrastruc-

ture Development.” Witnesses were: Dr. Joannie Chin, Deputy Director, Engineering Laboratory, National Institute of Standards and Technology; Dr. Hota V. GangaRao, Wadsworth Distinguished Professor, Statler College of Engineering, West Virginia University; Dr. David Lange, Professor, Department of Civil and Environmental Engineering, University of Illinois at Urbana-Champaign; and Mr. Shane E. Weyant, President and CEO, Creative Pultrusions, Inc.

On May 8, 2018, the Research and Technology and the Oversight Subcommittees of the House Committee on Science, Space, and Technology held a hearing entitled, “Leveraging Blockchain Technology to Improve Supply Chain Management and Combat Counterfeit Goods.” The purpose of this hearing was to highlight potential and proven applications of blockchain and distributed ledger technology in shipping, logistics, and customs. Witnesses were: Dr. Douglas Maughan, Cybersecurity Division Director, Science and Technology Directorate, Department of Homeland Security; Mr. Robert “Bob” Chiaviello, IPR Counsel, Nuby Law; Mr. Michael White, Head of Global Trade Digitization, Maersk; and Mr. Chris Rubio, Vice President Global Customs Brokerage Staff, UPS.

On June 26, 2018, the Research and Technology and the Energy Subcommittees of the House Committee on Science, Space, and Technology held a hearing entitled, “Artificial Intelligence—With Great Power Comes Great Responsibility.” The purpose of the hearing was to understand the state of artificial intelligence technology and the difference between narrow and general intelligence. Witnesses were: Dr. Jaime Carbonell, Director, Language Technologies Institute, and Allen Newell Professor, School of Computer Science, Carnegie Mellon University; Dr. Tim Persons, Chief Scientist, U.S. Government Accountability Office; Mr. Greg Brockman, Co-Founder and Chief Technology Officer, OpenAI; and Dr. Fei-Fei Li, Chairperson of the Board and Co-Founder, AI4ALL.

On June 27, 2018, the Committee on Science, Space, and Technology met to consider H.R. 6229, the “National Institute of Standards and Technology Reauthorization Act of 2018.”

COMMITTEE VIEWS

Innovation Initiatives

In H.R. 6229, the Committee prioritizes NIST’s core laboratory programs by providing a 17 percent increase to \$850 million in FY 2019 for the NIST scientific and technical research and services account. This increase provides five specific innovation initiatives in emerging technology areas.

The fundamental measurement, quantum science and measurement dissemination mission area is increased by \$50 million to \$234 million in FY 2019 to accelerate basic quantum information science research and standards development and to address fundamental research gaps. With this increase, NIST Quantum Information Science is funded at \$80 million total, enabling the U.S. to take the lead in developing global quantum standards and measurements.

The cybersecurity and privacy mission area is increased \$20 million to \$103.2 million in FY 2019 to expand NIST’s fundamental and applied cybersecurity research to address key questions relat-

ing to privacy, security, and vulnerability of software tools and communications networks.

The physical infrastructure and resilience mission area is increased \$20 million to \$89.8 million in FY 2019 to expand the application of modeling to improve building performance and safety and to conduct disaster and failure event technical studies and prototype data repository development. Additionally, \$11 million of this increase is provided to expand NIST's composites research and standards development to facilitate the adoption of composite technology in American infrastructure.

The advanced communications, networks, and scientific data systems mission area is increased \$40 million to \$109.9 million in FY 2019 for Artificial Intelligence (AI) and Data Science, and Internet of Things connectivity, interoperability, and security. Half the increase, \$20 million, is provided to expand the research infrastructure and scientific staff needed to develop NIST's capabilities in AI and big-data science, including rigorous scientific testing to support the development of trustworthy AI systems. The other \$20 million allows NIST to continue to examine the Internet of Things and address measurement and security challenges created by the convergence of digital technologies with the physical world.

Design Data Clearinghouse

This legislation directs NIST to expand its composites research and standards development to facilitate the adoption of composite technology in American infrastructure. As part of this research, NIST will establish a design data clearinghouse to identify, gather, validate, and disseminate existing design criteria, tolls, guidelines, and standards. It is the Committee's intent that NIST will begin developing a plan to gather currently existing data in order to establish a design data clearinghouse within six months after the date of enactment of this act.

Assistance to Federal Agencies

The Committee believes that NIST continues to do an excellent job in creating and maintaining responsible cybersecurity standards for federal agencies to follow. NIST's cybersecurity technical standards and risk management framework are widely regarded as among the best and most comprehensive in the world. It is the Committee's desire that as federal agencies take steps to implement E.O. 13800 and use NIST's Framework for Improving Critical Infrastructure Cybersecurity, they also take advantage of the singular expertise of NIST experts in evaluating and examining their cybersecurity compliance and corrective actions.

SECTION-BY-SECTION

Sec. 1. Short title

This section establishes the short title for the bill as the "National Institute of Standards and Technology Reauthorization Act of 2018."

Sec. 2. Authorization of appropriations

This section authorizes NIST for \$1,198,500,000 for fiscal year 2018, including: \$724,500,000 for scientific and technical research

and services laboratory activities; \$319,000,000 for construction and maintenance of facilities; and \$155,000,000 for industrial technology services.

This section also authorizes NIST for \$1,125,000,000 for fiscal year 2019, including: \$850,000,000 for scientific and technical research and services laboratory activities, of which \$109,900,000 is for communications, networks, and scientific data systems mission area, \$103,200,000 is for cybersecurity and privacy mission area, \$234,000,000 is for the fundamental measurement, quantum science and measurement dissemination mission area, and \$89,800,000 is for the infrastructure and resilience mission area; \$120,000,000 for the construction and maintenance of facilities; and \$155,000,000 for industrial technology services.

Sec. 3. Quantum information

This section states that the Secretary shall: continue to support and expand research connected to quantum information science necessary to advance commercial quantum development; collaborate with other Federal agencies to train scientists in quantum information science; establish or expand collaborative ventures with public or private sector entities to advance the field of quantum information science and engineering; and grants the authority to enter into cooperative research and development arrangements, grants, and work associated with quantum information. The section also directs NIST to convene a workshop with stakeholders to discuss issues related to quantum development with the goal of assessing research areas to support, and consider recommendations for NIST's participation. It instructs NIST to devote no less than \$80,000,000 to carry out this section in fiscal year 2019.

Sec. 4. Cybersecurity

This section directs the Secretary to expand NIST's ongoing cybersecurity research to include key questions relating to the measurement of privacy, security and vulnerability of software tools and communication networks by developing research and engineering capabilities to provide practical solutions to cybersecurity challenges, investing in cybersecurity measurement tools, and investing in tools to provide the U.S. with strong cybersecurity and encryption technologies. This section also grants authority to the Secretary to enter into cooperative research and development arrangements, grants, and work associated with cybersecurity.

Sec. 5. Composites research

This section states that the Secretary shall: implement recommendations to facilitate the adoption of composite technology in U.S. infrastructure; establish a design clearinghouse to identify, gather, validate, and disseminate existing composites design criteria; and develop resources for the testing and evaluation of uses for composite materials in infrastructure. It instructs NIST to devote no less than \$11,000,000 to carry out this section in fiscal year 2019.

Sec. 6. Artificial intelligence and data science

This section states that the Secretary shall continue to conduct research to support the development of artificial intelligence (AI)

and data since, including through: the expansion of NIST's capabilities; conducting rigorous testing to develop safe and trustworthy AI and data systems; and developing machine learning and other AI applications to support measurement science research and modernize NIST's research infrastructure.

Sec. 7. Internet of things

This section states that the Secretary shall continue to conduct research to support the expanded, interconnected systems of the Internet of Things by: developing new tools and methodologies for the cybersecurity of the Internet of Things; developing technologies to address network congestion and device interference; convene experts in the public and private sectors to create best practices and guidelines; and develop and publish new cybersecurity tools, encryption methods, and best practices for Internet of Things security.

Sec. 8. Hiring and management

This section grants the Secretary the authority to appoint research, engineering and professional personnel to carry out research and development work that requires specially qualified skills in cybersecurity and quantum information science and technologies, without regard to civil service laws. Pay rate will not exceed that of the Vice President of the United States and NIST is limited to appoint ten personnel to these positions. This provision also includes a five-year sunset.

Sec. 9. Definitions

This section defines the terms "Director," "Framework," "Institute," "institution of higher education," and "Secretary."

EXPLANATION OF AMENDMENTS

A manager's amendment offered by Representative Barbara Comstock was adopted by the Committee. The amendment made technical changes.

COMMITTEE CONSIDERATION

On June 27, 2018, the Committee met in open session and ordered reported favorably the bill, H.R. 6229, as amended, by voice vote, a quorum being present.

CORRESPONDENCE

TREY GOWDY, SOUTH CAROLINA
CHAIRMAN

ONE HUNDRED FIFTEENTH CONGRESS

ELIJAH E. CUMMINGS, MARYLAND
RANKING MINORITY MEMBER

Congress of the United States
House of Representatives

COMMITTEE ON OVERSIGHT AND GOVERNMENT REFORM
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September 21, 2018

The Honorable Lamar Smith
Chairman, Committee on Science,
Space, & Technology
U.S. House of Representatives

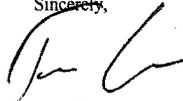
Dear Mr. Chairman:

I am writing concerning the jurisdictional interest of the Committee on Oversight and Government Reform in H.R. 6229, the "National Institute of Standards and Technology Reauthorization Act of 2018." As a result of your having consulted with me concerning the bill, the Committee on Oversight and Government Reform will not seek a sequential referral and agrees to forego formal action on the bill.

The Committee takes this action with our mutual understanding that by foregoing a request for a sequential referral of H.R. 6229 at this time we do not waive any jurisdiction over the subject matter contained in this or similar legislation. Further, I request your support for the appointment of conferees from the Committee on Oversight and Government Reform during any House-Senate conference convened on this or related legislation.

Finally, I would ask that a copy of our exchange of letters on this matter be included in the bill report filed by the Committee on Science, Space, and Technology, as well as in the Congressional Record during floor consideration, to memorialize our understanding.

Sincerely,



Trey Gowdy

cc: The Honorable Paul D. Ryan, Speaker
The Honorable Elijah E. Cummings
The Honorable Eddie B. Johnson
The Honorable Thomas J. Wickham, Parliamentarian

LAMAR S. SMITH, Texas
CHAIRMAN

EDDIE BERNICE JOHNSON, Texas
RANKING MEMBER

Congress of the United States
House of Representatives

COMMITTEE ON SCIENCE, SPACE, AND TECHNOLOGY

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September 24, 2018

The Honorable Trey Gowdy
Chairman
Committee on Oversight and Government Reform
U.S. House of Representatives
Washington, D.C. 20515

Dear Mr. Chairman:

I am writing concerning H.R. 6229, the "National Institute of Standards and Technology Reauthorization Act of 2018," which was ordered reported by the Science Committee June 27, 2018.

I agree that the Committee on Oversight and Government Reform has a valid jurisdictional interest in certain provisions of H.R. 6229, and that the Committee's jurisdiction will not be adversely affected by your decision to forego consideration of H.R. 6229. As you have requested, I will support your request for an appropriate appointment of outside conferees from your Committee in the event of a House-Senate conference on this or similar legislation should such a conference be convened.

Finally, I will include a copy of your letter and this response in the Committee Report and in the *Congressional Record* during the floor consideration of this bill. Thank you again for your cooperation.

Sincerely,



Lamar Smith
Chairman

cc: The Honorable Paul Ryan
The Honorable Elijah Cummings
The Honorable Eddie Bernice Johnson
Mr. Tom Wickham, Parliamentarian

APPLICATION OF LAW TO THE LEGISLATIVE BRANCH

Section 102(b)(3) of Public Law 104–1 requires a description of the application of this bill to the legislative branch where the bill relates to the terms and conditions of employment or access to public services and accommodations. This bill reauthorizes and strengthens programs of the National Institute of Standards and Technology. As such this bill does not relate to employment or access to public services and accommodations.

Legislative branch employees and their families, to the extent that they are otherwise eligible for the benefits provided by this legislation, have equal access to its benefits.

STATEMENT OF OVERSIGHT FINDINGS AND RECOMMENDATIONS OF
THE COMMITTEE

In compliance with clause 3(c)(1) of rule XIII and clause 2(b)(1) of rule X of the Rules of the House of Representatives, the Committee's oversight findings and recommendations are reflected in the descriptive portions of this report.

STATEMENT OF GENERAL PERFORMANCE GOALS AND OBJECTIVES

H.R. 6229, the National Institute of Standards and Technology Reauthorization Act of 2018, reauthorizes, strengthens, and prioritizes the programs of the National Institute of Standards and Technology.

DUPLICATION OF FEDERAL PROGRAMS

No provision of H.R. 6229 establishes or reauthorizes a program of the Federal Government known to be duplicative of another Federal program, a program that was included in any report from the Government Accountability Office to Congress pursuant to section 21 of Public Law 111–139, or a program related to a program identified in the most recent Catalog of Federal Domestic Assistance.

DISCLOSURE OF DIRECTED RULE MAKINGS

The Committee estimates that enacting H.R. 6229 does not direct the completion of any specific rule makings within the meaning of 5 U.S.C. 551.

FEDERAL ADVISORY COMMITTEE ACT

The Committee finds that the legislation does not establish or authorize the establishment of an advisory committee within the definition of 5 U.S.C. App., Section 5(b).

UNFUNDED MANDATE STATEMENT

Section 423 of the Congressional Budget and Impoundment Control Act (as amended by Section 101(a)(2) of the Unfunded Mandates Reform Act, P.L. 104–4) requires a statement as to whether the provisions of the reported include unfunded mandates. In compliance with this requirement the Committee has received a letter from the Congressional Budget Office included herein.

EARMARK IDENTIFICATION

H.R. 6229 does not include any congressional earmarks, limited tax benefits, or limited tariff benefits as defined in clause 9 of rule XXI.

COMMITTEE ESTIMATE

Clause 3(d)(2) of rule XIII of the Rules of the House of Representatives requires an estimate and a comparison by the Committee of the costs that would be incurred in carrying out H.R. 6229. However, clause 3(d)(3)(B) of that rule provides that this requirement does not apply when the Committee has included in its report a timely submitted cost estimate of the bill prepared by the Director of the Congressional Budget Office under section 402 of the Congressional Budget Act.

BUDGET AUTHORITY AND CONGRESSIONAL BUDGET OFFICE COST ESTIMATE

With respect to the requirements of clause 3(c)(2) of rule XIII of the Rules of the House of Representatives and section 308(a) of the Congressional Budget Act of 1974 and with respect to requirements of clause 3(c)(3) of rule XIII of the Rules of the House of Representatives and section 402 of the Congressional Budget Act of 1974, the Committee has received the following cost estimate for H.R. 6229 from the Director of Congressional Budget Office:

U.S. CONGRESS,
CONGRESSIONAL BUDGET OFFICE,
Washington, DC, July 16, 2018.

Hon. LAMAR SMITH,
*Chairman Committee on Science, Space, and Technology,
House of Representatives, Washington, DC.*

DEAR MR. CHAIRMAN: The Congressional Budget Office has prepared the enclosed cost estimate for H.R. 6229, the National Institute of Standards and Technology Reauthorization Act of 2018.

If you wish further details on this estimate, we will be pleased to provide them. The CBO staff contact is Stephen Rabent.

Sincerely,

MARK P. HADLEY
(For Keith Hall, Director).

Enclosure.

H.R. 6229—National Institute of Standards and Technology Reauthorization Act of 2018

H.R. 6229 would authorize the appropriation of \$1.1 billion for 2019 for the National Institute of Standards and Technology, which promotes innovation and industrial competitiveness in the United States through advancements in measurement science, standards, and technology. The bill also would direct the agency to carry out specific activities. The agency received \$1.2 billion in 2018.

As shown in the table, and based on historical spending patterns, CBO estimates that implementing the bill would cost \$1.1 billion over the 2019–2023 period, assuming appropriation of the authorized amounts for 2019.

	By fiscal year, in millions of dollars—						
	2018	2019	2020	2021	2022	2023	2019– 2023
INCREASES IN SPENDING SUBJECT TO APPROPRIATION							
Authorization Level	1,199	1,125	0	0	0	0	1,125
Estimated Outlays	0	708	288	60	38	19	1,113

The bill would authorize the appropriation of \$1.2 billion in 2018. CBO does not estimate any outlays for that authorization because appropriations for 2018 have already been provided.

Enacting the bill would not affect direct spending or revenues; therefore, pay-as-you-go procedures do not apply.

CBO estimates that enacting H.R. 6229 would not increase net direct spending or on-budget deficits in any of the four consecutive 10-year periods beginning in 2029.

H.R. 6229 contains no intergovernmental or private-sector mandates as defined in the Unfunded Mandates Reform Act.

The CBO staff contact for this estimate is Stephen Rabent. The estimate was reviewed by H. Samuel Papenfuss, Deputy Assistant Director for Budget Analysis.

