

NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY

Appropriations, 2019	\$985,500,000
Budget estimate, 2020	¹ 667,581,000
Committee recommendation	1,038,000,000

¹ Does not include the legislative proposal for Construction of Research Facilities, proposed in the fiscal year 2020 budget submission.

The Committee's recommendation provides \$1,038,000,000 for the National Institute of Standards and Technology [NIST]. The recommendation is \$52,500,000 above the fiscal year 2019 enacted level and \$370,419,000 above the budget request. Up to \$9,000,000 may be transferred from the Scientific and Technical Research and Services account to the Working Capital Fund.

NIST's mission is to promote U.S. innovation and industrial competitiveness by advancing measurement science, standards, and technology in ways that enhance economic security and improve our quality of life.

SCIENTIFIC AND TECHNICAL RESEARCH AND SERVICES

(INCLUDING TRANSFER OF FUNDS)

Appropriations, 2019	\$724,500,000
Budget estimate, 2020	611,719,000
Committee recommendation	753,500,000

The Committee's recommendation provides \$753,500,000 for NIST Scientific and Technical Research and Services [STRS]. The recommendation is \$29,000,000 above the fiscal year 2019 enacted level and \$141,781,000 above the budget request. The Committee directs NIST to provide a detailed spending plan for NIST's highest priority laboratory programs describing resources used for each program, project, or activity.

The Committee rejects the proposed terminations and reductions for the following STRS programs: Advanced Manufacturing and Material Measurements; Fundamental Measurement, Quantum Science, and Measurement Dissemination; Advanced Communications, Networks, and Scientific Data Systems; Biological Science and Health Measurements; Environmental Measurements; Time and Fundamental Measurement Dissemination; the Fire Research Grants Program; the Special Programs Office; the Standards Coordination Office; NIST Center of Excellence Program; and NIST User Facilities. The Committee adopts the proposal regarding Disaster Resilience Research Grants Program.

Cybersecurity.—The Committee is aware of the Nation's growing need for a trained cybersecurity workforce and directs that no less than the fiscal year 2019 level is provided for cybersecurity research, outreach, industry partnerships, and other activities at NIST, including the National Cybersecurity Center of Excellence. Within the funds provided, the Committee encourages NIST to fund additional university system-led State and regional alliances and partnerships to focus on meeting the demand for a trained cybersecurity workforce, with a priority being placed on areas with a high concentration of Department of Defense, automotive, and health care related industries.

Industrial Internet of Things [IIoT].—The Committee provides no less than \$2,000,000 for the continued development of an IIoT

cybersecurity research initiative and to partner, as appropriate, with academic entities and industry to improve the sustainable security of IIoT devices in industrial settings, including new designs, protocols, algorithms, system architectures, identity and lifecycle strategies, and system hardware features, as well as proposed security standards. This proposed research will account for human, technical, and economic dimensions. These advanced strategies should couple computer science and engineering, psychology, economics, cryptography, and network research to deliver significant mitigations and options for industrial adoption, as well as guidance to consumers and industry on how to manage and utilize these devices consistent with best security practices.

Quantum Information Science [QIS].—The Committee recognizes the urgent need to advance U.S. QIS capabilities, and the critical role that NIST plays in this effort. The Committee commends NIST for establishing the Quantum Economic Development Consortium, as authorized by the National Quantum Initiative Act (Public Law 115–368), in fiscal year 2019, and directs NIST to provide the Committee with the report called for in Section 201(b)(3) of Public Law 115–368. The Committee provides \$10,000,000 above the fiscal year 2019 enacted level to further implement the National Quantum Initiative Act.

Forensic Sciences.—The Committee provides no less than the fiscal year 2019 amount for forensic science research. Additionally, the Committee provides \$3,000,000 to support the Organization of Scientific Area Committees and \$1,000,000 to support technical merit evaluations.

Helmet Safety.—The Committee is aware of scientific data that demonstrates a correlation between football-related collisions and concussions, as well as other traumatic brain injuries that can lead to debilitating neural diseases such as dementia and chronic traumatic encephalopathy. The Committee encourages NIST to investigate an effective national testing standard to better scientifically understand the inadequacies of sports helmets while exploring future product designs that can safely reduce the neural risk of playing football, hockey, and other high-impact sports. The academic community has substantial knowledge about these issues, and NIST should work cooperatively with the academic community by funding research for advanced helmets and equipment and in developing new testing standards to ensure player safety. Additionally, NIST should consider establishing an effective national testing standard to inform the development of youth-specific helmet safety standards.

Metals-Based Additive Manufacturing.—The Committee provides no less than the fiscal year 2019 enacted amount for competitive external grants for academic institutions to support research, development, and workforce training to overcome barriers to high-volume additive manufacturing of metals. While the Committee is aware of recent breakthroughs in metals-based additive manufacturing, major technical barriers still exist to dramatically improving build rates that would enable commercial markets to benefit from high-volume, metals-based additive manufacturing.

Plastics and Polymeric Materials.—The Committee recognizes the significant contributions that plastics have made to virtually all

sectors of the economy, including in healthcare, infrastructure, food, and cosmetics, among many others. However, plastics take significant time to degrade in the environment due to their durability. The Committee believes advancements in creating products from recycled plastics could provide a more sustainable option for their use. Many hurdles remain in manufacturing products from recycled plastics with the same strength, color, odor, and malleability of new plastic products. Therefore, the Committee provides \$1,000,000 above the fiscal year 2019 enacted amount for competitive external grants for academic institutions to investigate plastic and polymeric materials, as well as novel methods to characterize both known and newly developed materials. Such investigations should address ways to increase the strength of recycled plastics and better understand mechanical properties including tensile stress, compressive stress, thermal properties, and nanostructure of polymeric materials that could serve as industry standards for recycled plastic products.

Composites.—The Committee recognizes that composites have wide-ranging proven characteristics that include lightweight, high-strength, corrosion resistance, lifecycle cost benefits, and long-term durability that translate to increased factors of safety for infrastructure engineering designs. The Committee urges NIST to work with relevant Federal agencies to coordinate existing standards and test methods for the use of composites and other innovative materials in infrastructure.

Pyrrhotite in Concrete Aggregate.—The Committee recognizes that concrete foundations containing pyrrhotite can crack and cause structures to collapse and that more research is necessary to address this significant harm. The Committee provides no less than \$1,500,000 for NIST to partner with an academic institution on a study to develop a reliable and cost-effective standard for testing for the presence of pyrrhotite in concrete used in residential, commercial, and municipal structures. The study should also develop a risk rating scale that quantifies the amount of pyrrhotite that causes the foundation to become structurally unsound. Specifically, the study should determine how pyrrhotite reacts with environmental substances such as water, oxygen, and sulfides, and determine to what level pyrrhotite may exist in concrete without weakening the material.

Regenerative Medicine Standards.—The Committee commends NIST, the Food and Drug Administration, and the Standards Coordinating Body for continued work to implement the regenerative medicine standards provisions enacted under the 21st Century Cures Act (Public Law 114–255). Currently, work is underway to develop processes and criteria for identifying, prioritizing, and assessing the quality, safety, feasibility, and cost-benefit of such standards. The Committee provides \$2,500,000 for NIST to improve measurement assurance and standards coordination for regenerative therapies, including: establishing a regenerative medicine assay validation and innovation core to provide laboratory support for evaluation of standardized assays, and conducting inter-laboratory studies to improve measurement assurance and develop appropriate reference materials.

Graphene Research and Commercialization.—The Committee recognizes the emergence of graphene as an innovative material with significant commercial and national security potential. The Committee also recognizes that other countries are ahead of the United States in patenting and commercializing applications with this material. The Committee provides no less than \$1,500,000 for NIST to fund and pursue graphene research activities with industry and academic institutions with expertise, existing capabilities, and infrastructure related to the commercial application of graphene.

Urban Dome Program.—The Committee notes the value of NIST's Urban Dome program and the importance of accurate measurement science for environmental monitoring and human health. More than half the world's population is living in urban areas, and this concentration is expected to intensify over the coming decades. The Committee provides no less than the fiscal year 2019 amount for the Office of Special Programs to maintain and consider expanding the number of urban dome locations in fiscal year 2020.

Facial Recognition Vendor Test.—The Committee encourages NIST to continue to meet growing demand for the Facial Recognition Vendor Test and to improve the test. The Committee is aware that this test is an important resource for government, commercial, and academic developers to assess the quality of their facial recognition technologies. As more companies and government users invest in this technology, the test will continue to be a critical step for responsible use. The Committee encourages NIST to: expand testing to include a more diverse combination of demographics and environmental settings in the test data, develop educational material and work on image quality standards for data collection, expand testing to improve enhanced privacy technologies for better template protection, and expand existing testing infrastructure in support of these improvements.

Public Safety Unmanned Aerial Vehicle Challenge.—NIST has a long history in advancing the use of cutting-edge technologies for public safety response operations. There is a significant opportunity for public safety organizations to leverage Unmanned Aerial Vehicles [UAVs] to improve their operations and response capabilities and keep first responders and the citizens they serve safe. The Committee provides no less than \$2,500,000 for NIST, in partnership with academic institutions that have a strong history of flight operations in both UAV operational training and applied research environments, to run at least three UAV prize based challenges within 12 months of enactment of this act that focus on expanding the role that UAVs could play in emergency response operations. Topics could include the use of UAVs to: extend cellular coverage in remote areas; deploy sensor networks around buildings, to enable in-building tracking of public safety personnel; and provide real time situational awareness of on-scene response through the use of video and advanced analytics.

Artificial Intelligence [AI].—The Committee provides \$8,000,000 above the fiscal year 2019 enacted level to expand NIST's ongoing AI research and measurement science efforts, in support of the administration's Industries of the Future initiative. NIST is directed to develop resources for government, corporate, and academic uses

of AI to train and test systems, model AI behavior, and compare systems.

Measurement Science for Microelectronics.—The Committee notes the economic and national security importance of maintaining U.S. leadership in development and manufacturing of cutting-edge microelectronics. Therefore, the Committee provides \$5,000,000 for NIST to develop and deliver material characterization, standards, and analytical tools needed for advancing microelectronics technology.

Public Health Risk to First Responders.—The Committee recognizes the pressing public health risk associated with occupational exposure to per- and polyfluoroalkyl substances [PFAS], particularly among civilian and military firefighters. Therefore, the Committee directs NIST to conduct a study of new and unused personal protective equipment worn by firefighters to determine the prevalence and concentration of PFAS in the equipment, as well as the rate of at which PFAS may be released from the gear during normal wear and in what conditions, and provides \$2,000,000 for these purposes. NIST shall update the Committee on the progress of the study not later than a year after enactment of this act.

Baldrige Performance Excellence.—The Committee provides \$2,200,000 for costs associated with NIST’s current level of personnel support and expertise that contribute to the Baldrige program. The Committee continues to direct the Secretary to work with the Baldrige program’s private sector foundation to conduct a fundraising campaign to support the program as authorized in section 3(f) of Public Law 100–107, to ensure that the foundation has stable funding for the continuation of this program in the future. Additionally, the Committee commends the Baldrige program’s efforts to improve the adoption of the NIST Cybersecurity Framework and encourages the program to build more partnerships and self-assessment tools to help organizations with their cybersecurity risk management. Further, the Committee encourages Baldrige to continue to focus on and develop metrics and standards to assist rural healthcare providers by leveraging industry best practices.

INDUSTRIAL TECHNOLOGY SERVICES

Appropriations, 2019	\$155,000,000
Budget estimate, 2020	15,172,000
Committee recommendation	161,500,000

The Committee provides \$161,500,000 for Industrial Technology Services. The recommendation is \$6,500,000 above the fiscal year 2019 enacted level and \$146,328,000 above the budget request. Supporting the Nation’s manufacturers, especially small businesses, is critical to keeping America innovative in a global marketplace.

Hollings Manufacturing Extension Partnership Program [MEP].—The Committee rejects the proposed elimination of MEP and instead provides \$145,500,000 for the program. The funding provided above the fiscal year 2019 level is to be distributed evenly among the 51 MEP Centers. The Committee supports MEP’s focus on strengthening the existing network of MEP centers and providing additional support to centers based on the documented per-

formance of the center’s activities and the manufacturing capacity of the area served by the center.

Manufacturing USA.—The National Network for Manufacturing Innovation [NNMI] (also known as “Manufacturing USA”) program promotes American competitiveness by fostering the development of new manufacturing techniques and fields, accelerating commercialization, and providing technical assistance to U.S. companies. The Committee provides \$16,000,000 for NIST’s activities within Manufacturing USA. Of this amount, no more than \$5,000,000 may be used for coordination activities, of which up to \$1,000,000 may be used to support the Food and Drug Administration’s participation in biomanufacturing innovation institutes. Within funding provided, NIST shall strive to minimize administrative costs in order to provide support for collaborative research and development projects between institutes.

In addition, the Committee notes the passage of legislation to reauthorize NNMI by the Senate as part of the National Defense Authorization Act for Fiscal Year 2020 and provides \$1,000,000 for a competitive grant program to develop technology roadmaps for promising advanced manufacturing clusters. These grants should be made available to establish new or strengthen existing industry-driven consortia that address high-priority research challenges in order to grow advanced manufacturing in the United States. The Committee supports the GAO recommendations included in GAO-19-409 and directs NIST to implement them.

CONSTRUCTION OF RESEARCH FACILITIES

Appropriations, 2019	\$106,000,000
Budget estimate, 2020	¹ 40,690,000
Committee recommendation	123,000,000

¹Does not include the legislative proposal for Construction of Research Facilities, proposed in the fiscal year 2020 budget submission.

The Committee provides \$123,000,000 for construction of research facilities. The recommendation is \$17,000,000 above the fiscal year 2019 enacted level and \$82,310,000 above the budget request. The funding provided includes no less than \$43,000,000 for the continued renovation of NIST’s Building 1 laboratory.

Safety, Capacity, Maintenance, and Major Repairs [SCMMR].—Within the amount provided for Construction of Research Facilities, the Committee provides \$80,000,000 for SCMMR.

NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

(INCLUDING TRANSFER OF FUNDS)

Appropriations, 2019	\$5,424,695,000
Budget estimate, 2020	4,456,968,000
Committee recommendation	5,337,343,000

The Committee’s recommendation provides \$5,337,343,000 for the National Oceanic and Atmospheric Administration [NOAA]. The recommendation is \$87,352,000 below the fiscal year 2019 enacted level and \$880,375,000 above the budget request.

The Committee commends the Department for its work to bring down the costs associated with NOAA’s Procurement, Acquisition and Construction [PAC] accounts. The decrease in PAC resources