COMMITTEE ON
SCIENCE, SPACE AND TECHNOLOGY
CHAIRMAN FRANK LUCAS

FULL COMMITTEEE

HEARING CHARTER

"An Overview of the Budget Proposal for the National Institute of Standards and Technology for Fiscal Year 2024"

Wednesday, May 10, 2023
10:00 a.m.
2318 Rayburn House Office Building

Purpose
The purpose of the hearing is to review the Administration's Fiscal Year 2024 (FY24) budget request for the National Institute of Standards and Technology (NIST). The hearing will provide an opportunity to conduct oversight and review policy issues related to NIST. The hearing will also provide an opportunity to conduct oversight and review issues related to the implementation of the CHIPS for American Program.

Witnesses
- **The Honorable Dr. Laurie Locascio,** Director, National Institute of Standards and Technology

Overarching Questions
- Being known as "industry's lab," how is NIST responding to and meeting the ever-changing needs of industry as new opportunities arise and technology evolves?
- How far along are NIST and the Department of Commerce in the process of implementing the CHIPS for America Program and corresponding guardrails?
- What is the state of facilities on NIST campuses and what is the impact on NIST's ability to carry out its mission?
- What role does NIST play in working with U.S. industry to build safe and trustworthy artificial intelligence systems? How has industry responded to NIST's AI Risk Management Framework?
- How does the President's budget request support U.S. leadership in Quantum Information Sciences?
- How is NIST working to ensure we have trustworthy and resilient domestic supply chains?

Background
The National Institute of Standards and Technology (NIST) is a non-regulatory agency within the Department of Commerce. Originally founded in 1901 as the National Bureau of Standards, 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. 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, as well as radio stations in Hawaii and Colorado. NIST also maintains partnerships with the Hollings Marine Labs in Charleston, South Carolina, the JILA joint institute operated with the University of Colorado, and the Institute for Bioscience and Biotechnology Research (IBBR) and the Joint Quantum Institute, both operated in conjunction with the University of Maryland.

As of 2022, NIST employs about 3,400 scientists, engineers, technicians, support, and administrative personnel.[1] In addition, NIST annually hosts about 3,800 associates and facility users from academia, industry, and other government agencies.[2] NIST also partners with 1,450 manufacturing experts and staff at about 430 Manufacturing Extension Partnership (MEP) service locations around the country.[3]

National Institute for Standards and Technology (NIST) Spending
(dollars in millions)

Account	FY22 Omnibus	FY23 Omnibus	FY24 President's Request	Change from FY23	% Change from FY23
STRS (Labs)	$850.0	$953.0	$995.0	$42.0	4.4%
Industrial Technology Service	$174.5	$212.0	$375.0	$163.0	76.9%
Hollings MEP	$158.0	$175.0	$277.0	$102.0	29.7%
Manufacturing USA (NNMI)	$16.5	$37.0	$98.0	$61.0	164.9%
Construction of Research Facilities	$205.6	$462.3**	$262.0	($200.3)	-43.3%
Overall	**$1,230.1***	**$1,627.3***	**$1,632.0**	**$4.7**	**.29%**

**Excludes one-time supplemental funds. The FY23 Disaster Relief Supplemental provided an additional $40 M for STRS, $13M for MEP, and $14M for Manufacturing USA. The CHIPS & Science Act provided $50 Billion, including $39 B in semiconductor incentives, to the Department of Commerce for the CHIPS for America program, which NIST is operating and overseeing.*
*** Included $332.3 million in Congressional directed external projects.*

[1] https://www.gao.gov/assets/gao-23-105521.pdf
[2] https://www.gao.gov/assets/gao-23-105521.pdf
[3] https://www.nist.gov/mep/about-nist-mep/partnerships

NIST Budget Summary

The FY24 budget request for NIST is $1.6 billion, an increase of $4.7 million, or .29 percent from the FY23 enacted level.[4] The budget for NIST is divided into three main accounts: Scientific and Technical Research and Services (STRS), Industrial Technology Services (ITS), and Construction of Research Facilities (CRF).

Scientific and Technical Research Services (STRS)

The FY24 NIST budget request for Scientific and Technical Research and Services (STRS) is $995 million, an increase of $42.0 million or 4.4 percent over the FY23 level, which support the operations of six laboratories.[5] The NIST Laboratory Programs address increasingly complex measurement challenges, ranging from the very small (quantum devices for sensing and advanced computing) to the very large (vehicles and buildings), and from physical to virtual infrastructure (cybersecurity and the internet of things).

NIST currently operates six laboratory units, under STRS:

- **Material Measurement Laboratory (MML):** The MML serves as the national reference laboratory for measurements in the chemical, biological, and material sciences.[6] The MML provides measurement services, tools, and best-practice guides used by a broad set of industries including but not limited to: healthcare (biomarkers), renewable energy (measuring the quality of fuels), and forensic science (biometric identification techniques).
- **Physical Measurement Laboratory (PML):** PML is a world leader in measurement science, developing tools and techniques to meet the demands of American industry and science, providing calibrations, and disseminating standards and best practices[7]. To maintain state-of-the-art capabilities in realizing, disseminating, and measuring these quantities, PML invests in fundamental scientific research to push boundaries and prepare for next-generation measurement needs. This measurement expertise also helps America address key technical challenges in manufacturing, energy, advanced microelectronics, healthcare, climate, and quantum science.
- **Engineering Laboratory (EL):** The EL conducts research on engineering and manufacturing processes, systems, and equipment; engineering of sustainable and energy-efficient buildings; and engineering of disaster-resilient buildings, communities, and infrastructure [8]. EL's studies of major disasters help guide research and develop recommendations for design and construction practices to reduce hazards.
- **Information Technology Laboratory (ITL):** The ITL develops and disseminates standards, measurements, and testing for interoperability, security, usability, and reliability of information systems, including cyber security standards and guidelines for federal agencies and U.S. industry.[9] As a world-class measurement and testing laboratory spanning diverse areas of computer science, mathematics, statistics, and systems engineering, ITL supports areas of national importance, including cybersecurity and privacy, artificial intelligence, the internet of things, reliable computing, and future computing technologies and applications.

[4] https://www.commerce.gov/sites/default/files/2023-03/NIST-NTIS-FY2024-Congressional-Budget-Submission.pdf
[5] https://www.commerce.gov/sites/default/files/2023-03/NIST-NTIS-FY2024-Congressional-Budget-Submission.pdf
[6] https://www.nist.gov/mml
[7] https://www.nist.gov/pml
[8] https://www.nist.gov/el
[9] https://www.nist.gov/itl

- **Communication Technology Laboratory (CTL):** The Communications Technology Laboratory promotes the development and deployment of advanced communications technologies through the dissemination of high-quality measurements, data, and research supporting U.S. innovation, industrial competitiveness, and public safety[10]. CTL work establishes the metrological foundations for higher speeds, better connections, and more ubiquitous access amid rising wireless demand. CTL focuses on establishing vital technological foundations for the ongoing wireless revolution across public safety communications, next-generation communications for 5G and beyond, and testing for wireless innovations.
- **Center for Neutron Research (NCNR):** The NCNR provides a national user facility, utilized by universities, government, and industry, to study neutron-based measurement capabilities.[11] This level of measurement capabilities is unavailable anywhere else in the country, allowing researchers to answer questions in nanoscience and technology with a broad range of applications. On February 3, 2021, NIST shut down the NCNR after a single fuel element overheated and was damaged due to not being securely latched into place.[12] In March 2022, The Nuclear Regulatory Commission (NRC) issued a Special Inspection Report[13] on the NCNR and later granted NIST authorization to restart the NCNR in March 2023.[14]

STRS Budget Priorities

As new technologies develop and evolve, NIST's measurement research and services remain critical to national defense, homeland security, trade, and innovation. Within the request levels, the budget includes funding for new efforts, including:

- **Advancing Research in Critical and Emerging Technologies (CET), +$20M** for:
  - **Artificial Intelligence (AI), +$5 M**: For NIST to lead Federal efforts in AI-related standards development, measurement, and for evaluation of trustworthy AI.
  - **Quantum Information Science, +$5 M:** To improve metrology of high-fidelity, scaled quantum systems across multiple and hybrid physical platforms, supporting U.S. industry efforts to develop large-scale quantum computing processors, metrology tools for quantum networking, and transformative sensors.
  - **Biotechnology, +$5 M:** To invest in measurement platforms, standards, automation, and advanced data analytics integration strategies for rapid development and translation of innovative biotechnologies and biomanufacturing processes.
  - **Advanced Communication Research and Standards, +$5 M:** To have NIST provide U.S. industry with the fundamental measurements and data that it needs to be first-to-market with next-generation wireless communications systems and optical communications technologies. NIST will advance measurement science and standards to accelerate the development of the next generation of communications technologies, including 6G cellular systems and the Nationwide Public Safety Broadband Network for first responders. NIST will support research in standards development and work with industry consortia such as the NIST NextG Channel Model Alliance and the Open Radio Access Network (O-RAN) Alliance to ensure continued U.S. leadership in international standards development organizations such as the International Organization for

[10] https://www.nist.gov/ctl
[11] https://www.nist.gov/ncnr
[12] https://www.nist.gov/news-events/news/2021/02/nist-statement-february-3-2021-alert-nist-center-neutron-research
[13] https://www.nrc.gov/reading-rm/doc-collections/news/2022/22-012.pdf
[14] https://www.nrc.gov/cdn/doc-collection-news/2023/23-021.pdf

Standardization (ISO), International Telecommunication Union (ITU), and the 3rd Generation Partnership Project (3GPP).

- **Cybersecurity and Privacy, +$20M:** To increase efforts to build trust in the products, technologies, and services upon which consumers, industry, government agencies, the nation, and international partners rely. NIST will extend and strengthen its capacity to conduct research, develop standards and guidelines, and demonstrate the practical application of cybersecurity and privacy solutions through NIST's National Cybersecurity Center of Excellence. These investments will help NIST meet increased demand in areas of critical national importance such as digital identity research, including in biometrics and human factors, privacy-enhancing technologies, cryptography, commercial and opensource software, hardware, and Internet of Things (IoT) devices, as well as strengthening our cybersecurity and privacy workforce.
- **Trustworthy and Resilient Domestic Supply Chains, +$8M:** To expand its critical efforts addressing the nation's supply chain challenges by providing U.S. industry, other agencies, and the research community with the tools required to build trustworthy and resilient domestic supply chains. With increased funding, NIST will develop technology solutions for: (1) ensuring cybersecurity and building trust in supply chains ($4 million); (2) verifying authenticity of components in domestic supply chains, including 5G systems ($2 million); and (3) advancing manufacturing technologies to enhance domestic production of critical goods and reduce reliance on critical minerals ($2 million).
- **Climate Change and Environmental Sustainability, +$5.5M:** To assess the impact of carbon in the environment by expanding research efforts in strategies for CO2 removal and to develop greenhouse gas measurement tools and standards for a comprehensive approach that ensures accuracy and trustworthiness of carbon data.
- **Measurement Science Modernization, +$5M:** The increase will target two areas: 1) platforms to accelerate rapid deployment of industry-needed reference materials, such as new cold storage and automated bioprocessing workflows for increasing measurement standards delivery to support the bioeconomy, and 2) expansion of efforts on foundational measurements for the next generation of devices for critical positioning, navigation, and timing (PNT) applications to reduce the risk of vulnerabilities within our dissemination system.
- **National Construction Safety Team Act Implementation, +$5M:** To sustain and expand NIST's ability to support investigations under the National Construction Safety Team Act of 2002.
- **Advanced Neutron Research Instrumentation, +$3M:** To support the development and operation of innovative advanced neutron measurement instrumentation to ensure that the NIST Center for Neutron Research remains a world-class user facility.
- **NIST Diversity, Equity, Inclusion and Accessibility (DEIA) Initiatives, +$2.2M:** To support the priorities identified in the NIST DEIA Strategic Plan including strategic STEM partnerships with minority serving institutions and targeted STEM recruitment and retention strategies.

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Industrial Technology Services (ITS)

In addition to the NIST laboratories, NIST manages several extramural programs supporting industry. The FY24 budget request for Industrial Technology Services (ITS) is $374.9 million, an increase of $163.0 million or 76.9 percent over the FY23 level.[15]

Manufacturing Extension Partnership, +$60.3M

NIST's Hollings Manufacturing Extension Partnership (MEP) is a public/private partnership run by Centers in all 50 states and Puerto Rico that provides technical assistance for small and medium-sized manufacturers (SMMs) to modernize their operations and adapt to foreign competition. MEPs provide resources in five key areas: technology acceleration, supplier development, sustainability, workforce, and continuous improvement. You can find information about your local MEP here.

MEP Centers are supported by s a combination of federal funds, state funds, and industry client fees. Continued federal support for MEP centers remains a point of contention. As originally conceived, the centers were intended to become self-supporting after six years. The original legislation provided for a 50 percent federal cost-share for the first three years of operation, followed by declining levels of federal support for the final three years. In 1998, Congress eliminated the prohibition on federal funding after year six[16] and in 2017, Congress authorized NIST to provide up to 50 percent of the capital and annual operating and maintenance funds required to establish and support a center.[17] The 2020 CARES Act provided $50 million in supplemental support for the MEP program and waived the matching requirements. In addition, for the past several years, Centers have had the option to waive cost share for base funds due to appropriations language.[18]"

The CHIPS and Science Act reauthorized the MEP program at $2.23 billion over five years[19]. The act also established a pilot program at MEP to provide services for workforce development (which may include training advanced manufacturing personnel), resiliency of domestic supply chains, and expanded support for adopting advanced technology upgrades at small and medium manufacturers. Awards can be used to connect manufacturers with services provided in their community, as is currently done by groups such as institutions of higher education, public private partnerships, state governments, and collections of entities and individuals. Awards can also be used to establish demonstration laboratories to support the development of next-generation technologies that can be adopted by small- and medium-sized manufacturers. Centers applying to the pilot program are not required to provide matching funding.

CHIPS and Science also directed MEP to establish a voluntary national supply chain database under MEP, -as an integration of state-level databases - to assist the Federal Government and industry sectors in minimizing disruptions to United States' supply chains.

In January, NIST MEP released its 2023-2027 Strategic Plan.[20]

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[15] https://www.commerce.gov/sites/default/files/2023-03/NIST-NTIS-FY2024-Congressional-Budget-Submission.pdf
[16] P.L. 105-277
[17] P.L. 114-329
[18] P.L. 117-328
[19] P.L. 117-167
[20] https://www.nist.gov/system/files/documents/2023/01/27/MEP_Strategic_2023-2027_plan_508_final.pdf

Manufacturing U.S.A. (a.k.a. NNMI), +$100.9M
In December 2014, Congress passed the Revitalize American Manufacturing and Innovation Act (RAMI), which established the National Network for Manufacturing Innovation program, which is now generally referred to as Manufacturing USA.[21] The CHIPS and Science Act authorized the Manufacturing USA Program at $829 million over 5 years. The program consists of a public-private network of 16 individual manufacturing Institutes that have unique technological concentrations, but also work in coordination to accelerate U.S. advanced manufacturing. The goals of the Institutes are to connect member organizations, work on major research and development collaboration projects to solve industry's toughest challenges, and train people on advanced manufacturing skills. NIST is responsible for coordinating the network of Institutes but currently only sponsors one -NIMBL (bio-pharmaceutical manufacturing).The Department of Energy and Department of Defense sponsor the other 15. The list of current institutes may be found here.

P.L. 117-328, the Consolidated Appropriations Act of 2023, provided an additional $14 million, which NIST is utilizing to stand up a new Manufacturing USA Institute. In addition, the CHIPS and Science Act authorized up to three new Institutes focused on semiconductor manufacturing. NIST put out a request for information on developing these institutes, which closed in March 2023.[22] The President's budget request, which seeks an increase of $60 million or 165 percent, would provide for up to ten new institutes by 2028.

Construction of Research Facilities
The Administration's FY24 budget request for Construction of Research Facilities (CRF) is $262 million, a decrease of $200.3 million or 43.3 percent under the FY23 level.[23]

The aging and deteriorating buildings and infrastructure on its two campuses threaten NIST's ability to meet its mission. While some improvements have been made, the current lack of environmental control and failing infrastructure remain a serious impediment to NIST's ability to conduct advanced measurement science and research. A recent National Academies' report found that NIST's recapitalization plan is estimated between $300 million to $400 million in construction funding annually for the next 12 years.[24] Additional estimated funding of $120 million to $150 million per year is also needed to stabilize the effects of further deterioration. Numerous major utility infrastructure systems are currently in critical condition, creating risks of catastrophic failure of entire laboratory buildings.

CRF Budget Priorities
- **Repair and Revitalization of NIST Facilities, +$48.6M:** To support infrastructure improvements and enhancement of research spaces across the two campuses to ensure NIST can support a leading-edge research and development program that advances U.S. innovation in quantum information science, artificial intelligence, advanced manufacturing, cybersecurity, privacy, 5G telecommunications and other critical programs.

[21] P.L. 113-235
[22] https://www.nist.gov/oam/manufacturing-usa-semiconductor-institute-rfi
[23] https://www.commerce.gov/sites/default/files/2023-03/NIST-NTIS-FY2024-Congressional-Budget-Submission.pdf
[24] https://nap.nationalacademies.org/catalog/26684/technical-assessment-of-the-capital-facility-needs-of-the-national-institute-of-standards-and-technology

- **Gaithersburg Central Utility Plant (CUP) Modernization, +$50M:** To provide for the full modernization of the CUP to replace all existing infrastructure and older equipment with new state-of-the-art sustainable systems.
- **Multiple HVAC System Replacements, +$30M:** To ensure air handling units and related heating, ventilation, and air conditioning distribution systems in most buildings across the Gaithersburg, Maryland, campus provide clean, temperature-controlled air at proper ventilation rates to building occupants.

CHIPS for America Program

The William M. (Mac) Thornberry National Defense Authorization Act for Fiscal Year 2021, Title XCIX, (P.L. 116-283)[25] contained various provisions intended to increase U.S. competitiveness in semiconductor design, manufacturing, and research. Notably the act:

- Authorized the Secretary of Commerce to establish a program to provide financial assistance to incentivize investment in facilities and equipment in the U.S. related to semiconductor fabrication, assembly, testing, advanced packing, and research and development.
- Authorized the Secretary, in collaboration with the Secretary of Defense, to establish a National Semiconductor Technology Center (NSTC) for the purpose of conducting research and prototyping of highly-advanced semiconductor technologies.
- Directed the Secretary of Commerce, through NIST, to create a National Advanced Package Manufacturing Program.
- Directed NIST to carry out a microelectronics research program to advance the state of chips-enabling technologies and materials.
- Authorized NIST to establish a Manufacturing USA institute focused on semiconductor manufacturing.

However, the Act did not appropriate funds for the Department of Commerce and NIST to carry out these activities. In August 2022, President Biden signed the CHIPS and Science Act of 2022 into law, which provided $50 billion for the Department of Commerce, $39 billion for the semiconductors incentives program and $11 billion for semiconductor R&D, to carry out the activities authorized by the 2021 NDAA and strengthen the U.S. position in semiconductor research, development, and manufacturing.[26] CHIPS and Science also clarified eligibility for the incentive program and included guardrails, prohibiting companies who accepted funds from building new manufacturing capacity of advanced semiconductors in countries of concerns. Following its passage, the Secretary of Commerce tasked NIST with carrying out the bulk of CHIPS and Science activities.

In February 2023, the CHIPS Program Office released the first funding opportunity, which seeks applicants for projects for the construction, expansion, and modernization of commercial facilities for the fabrication of leading-edge, current-generation, and mature-node semiconductors[27]. The CHIPS Program Office plans to release additional funding opportunities for semiconductor materials and manufacturing equipment facilities and R&D facilities.

Under the NOFO, only facilities with the following capabilities are currently eligible to apply:

- Leading-Edge – Production of 1) logic, using extreme ultraviolet (EUV) lithography tools; 2)

[25] P.L. 116-283
[26] P.L. 117-167
[27] https://www.nist.gov/chips/notice-funding-opportunity-commercial-fabrication-facilities

for memory, 3D NAND flash chips with 200 layers and above, and/or dynamic random-access memory (DRAM) chips with a half-pitch of 13 nm and below.
- Current-Generation – Production of semiconductors up to 28 nm process technologies, and include logic, analog, radio frequency, and mixed-signal devices.
- Mature-Node – Production of 1) logic and analog chips that are not based on FinFET, post-FinFET transistor architectures, or any other sub-28 nm transistor architectures; 2) discrete semiconductor devices such as diodes and transistors; 3) optoelectronics and optical semiconductors; and 4) sensors.
- Back-end Production – The assembly, testing, or packaging of semiconductors that have completed the front-end fabrication process, including advanced packaging of semiconductors.

There is no technical limit on the amount of assistance an applicant may receive, though the legislative language and language of the NOFO make it clear the funds are intended to supplement, not substitute, private funding. An applicant must also have a state or local financial incentive, make commitments to invest in workforce development, secure commitments from education and workforce partners, and commit to not expanding operations in China.

On April 24, 2023, NIST released its "Vision and Strategy for the National Semiconductor Technology Center (NSTC)"[28]. The NSTC will provide domestic access to advanced prototyping capabilities for the research and development community to advance new concepts and facilitate both the development and production of American technology on shore, energizing domestic manufacturing. Targeted research programs will deliver potentially disruptive and performance-enhancing capabilities. Faculty, students, and researchers will have access to experiential technical learning including state-of-the-art design environments and infrastructure, process design kits, and circuit design libraries to build the workforce needed to power manufacturing growth in the United States.

The NSTC will be run by a purpose-built not-for-profit organization to be selected in the near future. The NSTC will be the organization center of a network of institutes, both public and private, to advance the state of the art capacity for advanced semiconductor research, development, and design. The NSTC headquarters will house executive leadership of the center along with some in-house research, engineering, and other program capabilities. The headquarters location has not been selected. NIST has indicated that the National Advanced Manufacturing Institute will be housed under the NSTC as one of its partner institutions.

Additional NIST Activities

- **Framework for Improving Critical Infrastructure Cybersecurity** – NIST created this voluntary framework in 2014 which enables organizations – regardless of size, degree of cybersecurity risk, or cybersecurity sophistication – to apply the principles and best practices of risk management to improving security and resilience.[29] In 2017 President Trump enacted an Executive Order requiring all Federal Agencies to adopt and implement the framework.[30] Given NIST is a non-regulatory agency, they have no means to ensure the adoption of the framework by Federal agencies. In January 2023, NIST released a Concept Paper with

[28] https://www.nist.gov/chips/vision-and-strategy-national-semiconductor-technology-center
[29] https://www.nist.gov/news-events/news/2014/02/nist-releases-cybersecurity-framework-version-10
[30] https://trumpwhitehouse.archives.gov/presidential-actions/presidential-executive-order-strengthening-cybersecurity-federal-networks-critical-infrastructure/

potential significant updates to the Framework to reflect the ever-evolving cybersecurity landscape and help organizations better manage cybersecurity risk.[31] In April 2023, NIST released an early preliminary draft of the 2.0 Core Framework.[32]

- **Framework for Artificial Intelligence Risk Management (A.I. RMF)** – After direction from Congress in the national AI Initiative, NIST worked through a consensus-drive, open, collaborative, and transparent process to develop the AI RMF. NIST launched this voluntary framework in January 2023 which enables organizations to better mitigate risks associated with AI and incorporate trustworthiness into the design, development, use, and evaluation of AI products, services, and systems.[33] In March 2023, NIST launched the Trustworthiness and Responsible AI Resource Center, which will help facilitate the implementation of and alignment of the AI RMF.[34]
- **NIST Center of Excellence Program** – The NIST Center of Excellence Program supports collaborations between NIST and leading research institutes in emerging technology areas to expand NIST's impact and mission delivery through strategic partnerships with the country's foremost experts in critical areas.[35] Currently, NIST supports three Centers of Excellence in Advanced Materials, Community Resilience, and Forensic Science.
- **International Standards** – NIST's research supports the development of technical standards that are crucial to drive innovation and applications. Over 400 NIST staff participate in international standards activities as technical experts and in leadership roles. Standards underpin every aspect of our daily lives, from enabling communication technologies such as Bluetooth and WiFi to ensuring the safety of devices such as pacemakers and step ladders. They promote confidence in the performance of products and enable international trade. The standards leadership and expertise provided by NIST is an essential element of a broader U.S. strategy to ensure our global competitiveness. On May 4th, the White House announced the "United States Government's National Standards Strategy for Critical and Emerging Technology,"[36] NIST has been placed in charge of implementing the strategy, which is intended to help accelerate private sector-led standards efforts for critical and emerging technologies (CETs), contribute to interoperability, facilitate access to global markets, and ensure U.S. competitiveness and innovation.

Additional Reading Material

- Department of Commerce FY2024 Budget in Brief
- NIST Budget Justification to Congress
- NIST Budget Summary
- Department of Commerce Strategic Plan 2022-2026
- National Academies Report *"Technical Assessment of the Capital Facility Needs of the National Institute of Standards and Technology"*

[31] https://www.nist.gov/system/files/documents/2023/01/19/CSF_2.0_Concept_Paper_01-18-23.pdf
[32] https://www.nist.gov/system/files/documents/2023/04/24/NIST%20Cybersecurity%20Framework%202.0%20Core%20Discussion%20Draft%204-2023%20final.pdf
[33] https://nvlpubs.nist.gov/nistpubs/ai/NIST.AI.100-1.pdf
[34] https://airc.nist.gov/Home
[35] https://www.nist.gov/coe
[36] https://www.whitehouse.gov/wp-content/uploads/2023/05/US-Gov-National-Standards-Strategy-2023.pdf