

Testimony of

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Introduction

Chairman Lucas, Ranking Member Lofgren, and Members of the Committee, I am Laurie Locascio, Under Secretary of Commerce for Standards and Technology and the Director of the Department of Commerce's National Institute of Standards and Technology – known as NIST. Thank you for the opportunity to appear before you today to discuss the President's Fiscal Year (FY) 2025 budget request for NIST.

Our country's prosperity depends on NIST. During the 2023 holiday shopping period known as Cyber Week, consumers bought \$38 billion worth of retail items online. NIST protocols ensured that your home router connected securely to the internet, and that the internet didn't crash under high traffic. NIST cryptography standards ensured that credit card numbers weren't stolen in transit to the retailer.

When stock trades increase, it is NIST's time service, based on the world's most precise atomic clock, that ensures accurate timestamps on electronic trades that often occur just microseconds apart, preventing stock market fraud and manipulation.

Our communities and buildings like schools and hospitals are more resilient to natural hazards like tornadoes and hurricanes because we have learned from NIST investigations of building failures, and updated building codes.

Connected to NIST's roles in the TRANQ Research Act, NIST has developed methods to help doctors and law enforcement professionals fight the opioid crisis by measuring, identifying, and reporting drug trends in near real-time and consistently finding two to five new drugs in circulation on a monthly basis, helping to prepare stakeholders for the next emerging threat similar to fentanyl or xylazine.

We inspire trust in new technologies, the products of quintessential American innovation, so that industry and consumers can experience the benefits more quickly. NIST's research, measurements, and data help to keep people safe and healthy; make sure our communities are resilient and secure; and position our businesses for success in the global marketplace. NIST is the only Federal laboratory with a mission entirely focused on driving U.S. innovation and industrial competitiveness – and we do this through well-understood, verified measurements and standards that are critical for every step in the product development and commercialization cycle – from invention to refinement, manufacture to sales, and regulation to decommissioning.

NIST collaborates with industry in this work every step of the way. By working *together* and asking, "What are the difficult measurement problems that are holding your industry back?", NIST can help entire sectors overcome barriers to domestic and international competitiveness. NIST's measurement and standards solutions form the basis for the Nation's innovation to flourish – and not just for a month, or a year, but to set up U.S. businesses for decades of technological leadership to ensure our economic and national security.

Looking ahead to where NIST will be investing our time and resources, we know that building trust in the technology of the future is critical. If new technologies are not trusted, they are not

adopted. If new technologies are not adopted, we lose out on establishing leadership in the next cutting-edge technology, and on the benefits to our economic and national security.

We are building the Nation's trust in artificial intelligence (AI) systems through NIST's AI Risk Management Framework, our testing and evaluation work, and the newly launched U.S. AI Safety Institute, which I'm proud to say will be housed within NIST. In close collaboration with more than 200 of the leading AI companies, researchers, and members of civil society, we are also working to make sure that AI is safe, secure, and trustworthy. We see a future where AI will be used to realize huge efficiencies in R&D and manufacturing, and improve the daily lives of all Americans, from forecasting hurricanes, to increasing community disaster resilience, to saving more lives with better cancer screening and diagnosis. And we see a future where we can achieve these goals while minimizing potential harms from misuse of AI.

Quantum computing has similar potential. The National Quantum Initiative Act of 2018 created the Federal strategy for advancing quantum information science and NIST is proud to be one of the key enablers of the nascent domestic quantum ecosystem. NIST continues to support the needs of U.S. industry in increasing the commercialization of quantum information science and associated supply chains. Trust in NIST's science-first approach and years of experience in quantum measurements help the Nation maintain its competitive edge and develop new technologies sustainably and responsibly, and NIST's efforts to identify and support global adoption of the next generation of post-quantum cryptography (PQC) standards will play a pivotal role in protecting our data and systems once quantum computers become powerful enough to break the conventional encryption technologies that secure our digital world today.

Investing in NIST is an investment in the future of American innovation, industrial competitiveness, and public well-being. Today, I am pleased to appear before you with NIST's Fiscal Year (FY) 2025 budget request and describe how you can empower NIST to continue to lead U.S. science and technology innovation through dedicated investment in NIST measurement science, research, and standards. By fully funding NIST's budget request, we can continue this vital work and ensure that the U.S. is not left behind in the highly competitive global race for emerging technologies.

Fiscal Year 2025 Budget Request

The President's budget requests a total of \$1.5 billion for NIST in FY 2025 to advance U.S. innovation and industrial competitiveness. Through investments in research, measurements, and tools, NIST will drive discoveries and standards development in critical and emerging technologies; address urgent capital facility needs on the NIST campuses; and strengthen U.S. manufacturing and supply chains.

These budget investments above base will enable NIST to meet the national need for AI research, testing, and standards; advance quantum information science and technology readiness; and take the first steps toward much needed facilities revitalization.

Scientific and Technical Research Services (STRS) (\$975 million)

NIST's critical science and technology programs, including core measurement capabilities, ensure the global system of weights and measurements is grounded on scientific and technical

principles. When NIST is successful, the Nation is positioned to lead in critical and emerging technologies on the global stage, including in semiconductors, cybersecurity and privacy, advanced communications, biotechnology, artificial intelligence, quantum information science, and in technologies to advance electric and automated vehicles.

Meeting the National Need for Artificial Intelligence (AI) Research, Testing, and Standards

On October 30, 2023, the President signed the historic Executive Order on Safe, Secure, and Trustworthy Artificial Intelligence, which entrusts NIST with significant responsibilities to advance the state of AI-related research and fill gaps in technical guidance that industry, businesses, and governments rely on. Shortly thereafter in November, the Vice President and Secretary of Commerce Gina M. Raimondo announced the NIST-led U.S. AI Safety Institute, which will play a critical role in promoting the safe development and use of trustworthy AI.

The FY 2025 budget request includes \$50.0 million to fully realize the goals of the AI Executive Order and the U.S. AI Safety Institute. NIST will conduct AI research to build the science necessary to understand safe development and responsible use of AI; continue efforts to establish testing infrastructure and advance methods for AI system evaluation; develop technical guidance to measure and manage AI risks and enable responsible innovation; and implement best practices and frameworks to support organizations in measuring AI risks and impacts.

Advancing Quantum Information Science and Technology Readiness

Increasing investments and sustained efforts in quantum information science have resulted in the emergence of the quantum economy in the United States and globally. NIST experts, including our four Nobel laureates, developed technology and measurements that helped launch the quantum industry. As a leader in quantum research, NIST continues to support the U.S. quantum industry by engaging in strategic collaborations, as well as identifying and conducting R&D to increase U.S. leadership in this global endeavor. As other countries are rapidly investing in quantum technologies, NIST is requesting funding so that we can build and sustain the U.S. quantum economy as the best in the world for decades to come.

The FY 2025 budget request includes an increase of \$13.9 million above the FY 2024 enacted level for new efforts to advance quantum information science and technology readiness and build upon our global leadership role. With increased attention from international stakeholders on standardization related to quantum technology, NIST will proactively engage in standardization efforts to protect the integrity of the international standards ecosystem and ensure that resulting standards are based on sound science. NIST will support U.S. industry in moving present-day small-scale quantum demonstrations from the lab to the marketplace, address complex material properties that currently limit the performance of quantum devices, and implement and refine methods such as post-quantum cryptography to mitigate cybersecurity threats posed by quantum technologies.

Construction and Maintenance of Research Facilities and Infrastructure (CRF) (\$311.5 million)

NIST has been asked to take on an increasing number of wide-spanning responsibilities, from AI to quantum science and beyond. But the degraded state of our facilities is hindering our ability to meet this increasing demand. Without significant investment in world class research and

development facilities, NIST and more importantly our Nation will be left behind and unable to compete with our adversaries.

When they were commissioned after World War II, NIST's facilities in Gaithersburg, Maryland and Boulder, Colorado was considered state-of-the-art. After over 70 years, these facilities are degrading rapidly. As I said in my testimony last year, NIST facilities are in critical need of updating and maintenance to meet future needs in emerging technologies, and to provide a safe working environment for our staff.

The 2023 National Academies of Science, Engineering, and Medicine (NASEM) study on the condition of NIST's facilities has now been supplemented by several reports on individual NIST laboratories detailing some serious issues. In Gaithersburg, a NIST calibration service that supports homeland security, industrial sterilization and disinfection, and radiation safety, is out of service because the facility lacks adequate environmentally controlled conditions. Roof leaks have destroyed multi-million-dollar microscopes. A laboratory in Boulder that develops energy-saving electronics, essential to enhancing the competitiveness of the U.S. semiconductor industry, must navigate power failures and power spikes that damage equipment or require lengthy restarts.

Alarming, aging facility systems present safety concerns. NASEM estimates that "about 63% of NIST research facilities [are] failing to meet federally established standards for acceptable building conditions." NIST scientists not only need functional facilities, but also to feel safe to conduct their work.

The FY 2025 budget request includes \$311.5 million to address NIST facilities needs and the most critical utility infrastructure issues.

Construction of Research Facilities (\$178.3 M)

The FY 2025 budget request includes \$178.3 M to modernize the Radiation Physics building to support critical measurements. The Radiation Physics building is a one-stop shop for reliable radiation measurements to support national security, healthcare, energy, and research, including ensuring the accuracy of radiation doses used in every mammogram conducted in the country.

Congress appropriated funds for the first phase of this facility renovation, which was recently completed. However, the overall project is only half finished and some unique measurements and calibrations for stakeholders across the Nation are continually delayed, discontinued, or in physical spaces that compromise the safety of our staff. We need to finish the revitalization of this facility so that we can modernize the rest of the NIST campuses according to our long-term master plan.

Safety, Capacity, Maintenance and Major Repairs (+\$45.4 M)

The FY 2025 budget request includes an increase of \$45.4 M above the FY 2024 enacted level, for a total of \$133.2 million, to improve safety, repair and revitalize facilities, address maintenance backlogs, and prevent further loss of facilities and equipment. Funds would also help to modernize IT networking infrastructure to deliver the speed, reliability, and capacity

needed to meet future data and computing demands, particularly for AI, biotechnology, quantum information science, and advanced communications.

Industrial Technology Services (ITS) (\$212 million)

NIST's Hollings Manufacturing Extension Partnership (MEP) and Manufacturing USA are unique public-private programs that increase the competitiveness of U.S. manufacturers. MEP assists growth-oriented U.S.-based small and medium-sized manufacturers and about 40% of Manufacturing USA institute members are small- and medium-sized manufacturers. These programs help U.S. industry implement new technologies, develop robust supply chains, and engage underserved communities in workforce development programs.

Manufacturing Extension Partnership (MEP)

The MEP Network has centers in all 50 states and in Puerto Rico. Last year, MEP centers interacted with more than 36,000 U.S. manufacturers, leading to \$16.2 billion in new and retained sales, \$2.9 billion in cost savings, \$4.8 billion in new client investments, and helped create or retain more than 107,000 jobs. With the \$175 million in funding requested, MEP will continue to help narrow the workforce gap; mitigate supply chain vulnerabilities with the recently established National Supply Chain Optimization and Intelligence Network; and provide critical cybersecurity training and both technical assistance and support for adoption of advanced manufacturing practices.

Manufacturing USA

Manufacturing USA institutes bridge the gap from discovery to production and help ensure that U.S. inventions get out of the labs and become products manufactured by workers in the United States. In FY 2022, Manufacturing USA institutes worked with more than 2,500 member organizations on more than 670 applied research and development technology projects of high priority to industry. They engaged 106,000 workers, students, and educators in institute- and partner-led advanced manufacturing education and workforce programs.

This year, NIST announced our intent to launch competitions for two new Manufacturing USA institutes: one under CHIPS for America to create the first-of-its-kind digital twin institute to lead the world in revolutionizing semiconductor and advanced packaging manufacturing, and another focused on the use of AI to improve resilience of U.S. manufacturing. The FY 2025 budget request for \$37 million would help to accelerate the dissemination of technology and workforce skills from Manufacturing USA institutes to U.S. production via merit-based investments in industry testbeds across the institute network. This funding would support the new AI-focused institute and our current National Institute for Innovation in Manufacturing Biopharmaceuticals (NIIMBL).

Summary

NIST is at an inflection point in our history. We've enabled trusted weights and measures for almost 125 years in every sector of our economy. We've seen our mission expand in the last 40 years to directly support the measurements, standards, and technology needs of small and

medium manufacturers, and to channel our expertise to lead the Nation in advancing the measurement science and standards in cybersecurity, next-generation telecommunications, biotechnology, artificial intelligence, and quantum science – technologies that will define our position in the world for decades to come. But we need additional support to deliver on these critical roles for the Nation and to not cede U.S. leadership in these areas to our global competitors. We need the physical infrastructure to match the expertise of our world-leading scientists and engineers. And we need Congress to help us get to where we need to be through fully funding the President’s FY 2025 budget request for NIST. I look forward to working with you to make that support a reality and look forward to answering your questions.

Dr. Laurie Locascio, Under Secretary of Commerce for Standards and Technology/Director of the National Institute of Standards and Technology



Laurie E. Locascio is the 17th director of NIST and the fourth Under Secretary of Commerce for Standards and Technology. In this role, she provides high-level oversight and direction of NIST.

Dr. Locascio most recently served as vice president for research at the University of Maryland College Park and University of Maryland Baltimore, where she focused on the development of large interdisciplinary research programs, technology commercialization, innovation and economic development efforts, and strategic partnerships with industry, federal, academic, and nonprofit collaborators. She also served as a professor in

the Fischell Department of Bioengineering at the A. James Clark School of Engineering with a secondary appointment in the Department of Pharmacology in the School of Medicine.

Before joining the University of Maryland, Dr. Locascio worked at NIST for 31 years, rising from a research biomedical engineer to eventually leading the agency's Material Measurement Laboratory (MML). She also served as the acting associate director for laboratory programs, the No. 2 position at NIST, providing direction and operational guidance for NIST's lab research programs.

As director of MML, one of NIST's largest scientific labs, Dr. Locascio oversaw 1,000 research staff in eight locations around the United States and a \$175 million annual budget and recruited top talent, fostered excellence, and built a collegial and collaborative workplace. She implemented strategic partnerships with universities, industry, and other government labs, including a partnership with the University of Maryland's Institute for Bioscience and Biotechnology Research at the Universities at Shady Grove. Before that, Dr. Locascio served as chief of MML's Biochemical Sciences Division.

Dr. Locascio's most recent honors and awards include her 2021 induction as a fellow of the National Academy of Inventors, the 2017 American Chemical Society Earle B. Barnes Award for Leadership in Chemical Research Management, and the 2017 Washington Academy of Sciences Special Award in Scientific Leadership. She has published 115 scientific papers and has received 12 patents in the fields of bioengineering and analytical chemistry. Her honors and awards also include the Department of Commerce Silver and Bronze Medal Awards, the American Chemical Society Division of Analytical Chemistry Arthur F. Findeis Award, the NIST Safety Award and the NIST Applied Research Award. She is also a fellow of the American Chemical Society and the American Institute for Medical and Biological Engineering.

Dr. Locascio has a B.S. in chemistry from James Madison University, an M.S. in bioengineering from the University of Utah, and a Ph.D. in toxicology from the University of Maryland Baltimore.