FY 2016 Annual Performance Plan / FY 2014 Annual Performance Report

National Institute of Standards and Technology

Table of Contents

Part 1: Agency and Mission Information

Section 1.1: Overview

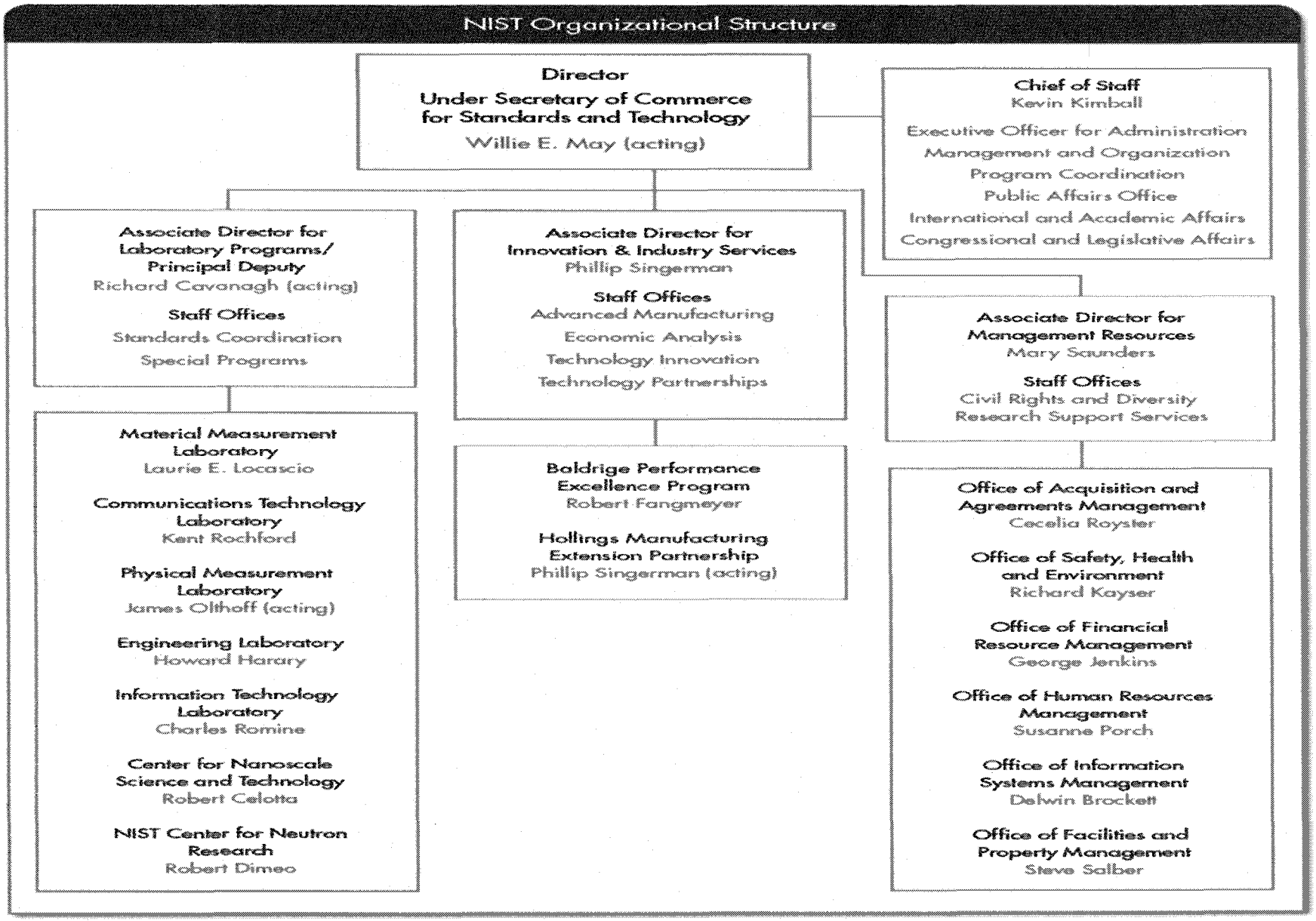
Since 1901, NIST (known as the National Bureau of Standards until 1988) has developed and maintained key standards for the Nation, a role that the U.S. Constitution assigns to the Federal government, and has been supplying the measurements and tools to help U.S. industry compete. As a non-regulatory agency in the U.S. Department of Commerce (DOC), an experienced partner of industry, and the Federal research agency specifically focused on promoting U.S. economic competitiveness, NIST is well-positioned to accelerate and promote innovation and advanced technologies through its laboratory programs and its Innovation and Industry Services Programs.

NIST employs about 3,000 scientists, engineers, technicians, and support and administrative personnel and carries out its technical work at its two main research campuses in Gaithersburg, Md., and in Boulder, Colo. At these campuses, NIST also hosts about 2,700 associates and facility users from academia, industry, and other government agencies who collaborate with NIST staff. NIST also participates in seven external institutes in basic physics, quantum physics, biology/biotechnology, biomedical measurement science, advanced materials, cybersecurity, and marine science, located in Boulder, Colo., College Park, Md., Palo Alto, Calif., Chicago, Ill, Rockville, Md., and Charleston, S.C., respectively. In addition, NIST partners with nearly 1,300 manufacturing specialists and staff at about 400 Hollings Manufacturing Extension Partnership (MEP) service locations around the country.

Section 1.2: Mission Statement

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.

Section 1.3: Organizational Structure



Part 2: Cross-Agency Priority Goals

Section 2.1: Overview

Per the GPRA Modernization Act requirement to address Cross-Agency Priority Goals in the agency strategic plan, the annual performance plan, and the annual performance report, please refer to www.Performance.gov for the agency's contributions to those goals and progress, where applicable. NIST currently contributes to the following CAP Goals: Cybersecurity, Job-creating investment, STEM Education, and Economic Growth: lab-to-market.

Lab-to-Market

Agency Official: Phillip Singerman, Associate Director Innovation and Industry Services

A sub-team from the Interagency Working Group met to draft a roadmap white paper addressing collaborations. The two main components will be 1) an analysis of CRADA language across agencies, to identify areas of commonality that could be used to create a standard template backbone, streamlining the negotiation process for outside partners; and 2) an analysis of agency-specific technology transfer authorities, how they are used at those agencies, and how other agencies envision using them for their own partnerships, with the goal of making recommendations for the expansion of certain authorities to additional agencies. NIST also made contributions towards two additional white papers on entrepreneurial training for researchers, and Entrepreneur-In-Residence programs at federal agencies. The Interagency Working Group is discussing using prize competitions to address questions about effective metrics. Future topics to be addressed at upcoming meetings include evaluating best practices in licensing, and discussing the promulgation of new regulations for improved personnel exchange. The Bayh-Dole working group is moving forward with university groups to begin discussing the state of Bayh-Dole and areas that may need to be addressed. NIST is reviewing, via the Federal Laboratory Consortium, best practices in incentivizing government researchers to participate in the technology transfer process, identifying opportunities for cross-agency training, and reviewing the consistency of data between FLCBusiness and GSA records.

Cybersecurity

Agency Official: Delwin Brockett, Office of Information Systems Management

Strong Authentication

During FY 2014, a NIST internal directive was issued requiring use of assigned PIV cards to authenticate to PIV enabled information systems. NIST has also proactively contributed to the development of a DOC directive on the use of PIV authentication. NIST has also enabled several of its internal applications to accept PIV card authentication.

Trusted Internet Connection
NIST completed implementation of these capabilities at its Gaithersburg, Maryland facilities in FY 2013 through the acquisition of AT&T Managed Trusted Internet Protocol Service (MTIPS) through the General Services Administration (GSA) Networx program. NIST Boulder, Colorado facilities rely on Internet services provided by National Oceanic and Atmospheric Administration (NOAA). NOAA anticipates their TIC implementation will be operational in FY 2015.

Continuous Monitoring
The DoC strategy for meeting this requirement is through the implementation of the DoC Enterprise Cybersecurity Monitoring and Operations (ECMO) initiative. DoC selected the IBM Tivoli Endpoint Manager (TEM) software platform for implementation of ECMO. On behalf of DoC, NIST implemented and provides TEM information system services for all DoC Operating Units.

Part 3: Strategic Goals and Objectives

Section 3.1: Corresponding DoC Strategic Goals, and Objectives

Goal	Objective Number	Objective Name	Leader
Innovation	2.1	Grow a more productive, agile, and high-value manufacturing sector through partnerships and collaborations that accelerate technology development and commercialization.	Willie May, Acting Under Secretary for Standards and Technology, Acting NIST Director
Innovation	2.2	Increase the capacity of U.S. regional economies to accelerate the production of value-added goods and services by providing services to and investments in businesses and communities.	Willie May, Acting Under Secretary for Standards and Technology, Acting NIST Director
Innovation	2.3	Strengthen the Nation's digital economy by championing policies that will maximize the potential of the Internet, expanding broadband capacity, and enhancing cybersecurity to provide a robust environment for innovation.	Larry Strickling, Assistant Secretary for Communications and Information, National Telecommunications and Information Administration (NTIA)
Innovation	2.4	Accelerate the development of industry-led skills strategies that result in a productive workforce for employers and high-quality jobs for workers.	Matt Erskine, Deputy Assistant Secretary, Economic Development Administration (EDA)
Innovation	2.5	Accelerate growth of innovation-intensive economic sectors by building public and private capacity to invent, improve, and commercialize new products and services.	Willie May, Acting Under Secretary for Standards and Technology, Acting NIST Director

Environment	3.1	Advance the understanding and prediction of changes in the environment through world class science and observations.	Kathy Sullivan, Under Secretary of Commerce for Oceans and Atmosphere and National Oceanic and Atmospheric Administration (NOAA) Administrator
Environment	3.3	Strengthen the resiliency of communities and regions by delivering targeted services to build capacity.	Kathy Sullivan, Under Secretary of Commerce for Oceans and Atmosphere and NOAA Administrator
Data	4.1	Transform the Department's data capacity to enhance the value, accessibility and usability of Commerce data for government, business and the public.	Mark Doms, Under Secretary for Economic Affairs, Economics & Statistical Administration (ESA)

Objective 2.1: Grow a more productive, agile, and high-value manufacturing sector through partnerships and collaborations that accelerate technology development and commercialization.

Strategies:

Establish the National Network for Manufacturing Innovation (NNMI). There is a gap in the U.S. innovation infrastructure that hinders the transition of new manufacturing processes and technologies from the lab bench to the manufacturing floor. The NNMI, a proposed national network of up to 45 institutes, will bring together companies, universities and community colleges, and government to develop world-leading technologies and capabilities that U.S.-based manufacturers can apply in production. As self-sustaining hubs, these institutes will create, showcase, and deploy new capabilities, new products, and new processes that can impact commercial production. They will build workforce skills at all levels and enhance manufacturing capabilities in companies large and small.

Support industry consortia to identify and address shared technical challenges. A common vision of long-term technology challenges can spur innovation across an industry. NIST's Advanced Manufacturing Technology (AMTech) program will provide grants to industry-led consortia to identify and prioritize research projects critical to long-term industrial advances. These technology roadmaps and related outputs will help guide applied research to meet industry's needs, some of which AMTech will support through university and government laboratory research funding.

Collaborate with industry on measurement science and standards to solve technical challenges. Rejuvenating U.S. manufacturing will require the development of measurements that support new, advanced manufacturing techniques. NIST will enhance partnerships with the U.S. manufacturing sector to develop and disseminate test methods, measurement tools and know-how, and scientific data that are embedded in the processes, products, and services of nearly every U.S. manufacturing industry.

Progress Update:

As part of the AMTech program, NIST in May 2014 awarded 19 advanced manufacturing technology planning awards totaling $9 million to new or existing industry-driven consortia. These grants will help the consortia develop research plans that address high-priority challenges impeding the growth of advanced manufacturing in the United States. Technology roadmapping is a key component of the projects. Each consortium will engage manufacturers of all sizes, university researchers, trade associations and other stakeholders in an interactive process to identify and prioritize research projects that reduce shared barriers to the growth of advanced manufacturing. In July 2014 NIST announced a new competition for a second round of planning grants totaling $5.6 million in two year grants, the funding opportunity closed in October 2014 and NIST is now reviewing the proposals.

Working with federal agencies including the Department of Defense (DOD), the Department of Energy (DOE), the National Aeronautics and Space Administration (NASA), and the National Science Foundation (NSF), the NIST-hosted Advanced Manufacturing National Program Office (AMNPO) is working to establish Institutes for Manufacturing Innovation and to develop a network of the institutes for exchanging best practices. AMNPO coordinated a successful meeting of institute leaders in 2014, and is planning additional opportunities to reinforce relationships across institutes. As part of these efforts, NIST has provided $19.5M to support research efforts at the various institutes. In addition, AMNPO has been developing guidance documents on important institute topics such as institute performance metrics and intellectual property rights. The AMNPO continues to coordinate with Hill staff to convey the importance and success of the institutes, for example through a Hill Day event on September 18, 2014. Bicameral legislation to establish the NNMI, the Revitalize American Manufacturing and Innovation Act is being considered in both the House of Representatives (H.R. 2996) and the Senate (S.1468).

Next Steps:

The NIST-hosted AMNPO is continuing to provide critical guidance for the networking and establishment of Institutes for Manufacturing Innovation, and to support meetings than bring together leadership from the various institutes. NIST is preparing for a DOC role in establishing future institutes upon authorization of NNMI. This planning will utilize recommendations from the recently released *Accelerating U.S. Advanced Manufacturing* report the President's Council of Advisors on Science and Technology, a federal advisory committee.

NIST laboratory programs will continue to expand their mechanisms for partnership with industry to accelerate innovation in advanced manufacturing. For example, the Material Genome Initiative (MGI) is strengthening ties with the materials Center of Excellence, the Center for Hierarchical Materials Design, and with a number of industry partners to address priority materials design needs. In addition, the NIST Center for Automotive Lightweighting recently commissioned a unique Next-Generation Formability System, which investigates the effect of multi-dimensional stress and strain. The NCAL is using this unique instrument to test industry-submitted samples, the results of which are shared with the Center's industry and academic partners.

Objective 2.2: Increase the capacity of U.S. regional economies to accelerate the production of value-added goods and services by providing services to and investments in businesses and communities.

Strategies:

Support small and mid-sized manufacturing by restoring robust supply chains. Small and mid-sized manufacturers are central to regional economic growth and innovation, but they can face unique challenges in deploying advanced manufacturing technologies. Through its national network of centers, the NIST Hollings Manufacturing Extension Partnership (MEP) will expand its efforts to strengthen the competitive position of small and mid-sized manufacturers through new efforts and partnerships focused on supply chain technology areas to speed the adoption of technology and commercialization.

Progress Update:

MEP funded five Manufacturing Technology Acceleration Center (MTAC) pilot projects in 2014 to accelerate technology adoption across US supply chains. In addition, MEP Centers are implementing a Center-developed supply chain optimization set of tools and materials focused on establishing a coaching and mentoring partnership between the MEP Center's subject matter experts and participating manufacturers to address barriers to effective supply chains. MEP centers help to improve supply chain performance by quantifying the needs of the supply chain and focusing on the points in the process that are impeding throughput. Total cost of ownership is one element on which the centers provide guidance, along with executive and partner engagement and risk management.
In June 2014, NIST MEP hosted the Grantee Regional Collaboration Meeting for the 53 grantee teams from four multiagency initiatives: the Jobs and Innovation Accelerator Challenge, the Rural Jobs Accelerator, the Advanced Manufacturing Jobs and Innovation Challenge and the Make It In America. These four initiatives are the result of the collaborative work of 8 federal entities: EDA, DOE, DOL, NIST MEP, SBA, USDA, ARC, DRA. The 150 attendees included representatives from the grantee teams from the 30 states such as Workforce Investment Boards, State Economic Development Agencies, MEP Centers, Universities, Community Colleges, regional councils, non-profits, chambers of commerce. The day and a half event provided a venue for information and peer knowledge exchange on the latest practices that will accelerate cluster and industry development in urban and rural regions for small and medium sized manufacturers, worker training, job creation and business investments in the United States.

The MEP program continues to provide valuable services to America's small and medium manufacturers. For every one dollar of federal investment, the MEP generates nearly $19 in new sales growth and $21 in new client investment. This translates into $2.2 billion in new sales annually. For every $1,978 of federal investment, MEP creates or retains one manufacturing job.

Next Steps:

In 2014, MEP, working with the MEP Advisory Board, developed a Strategic Plan that outlines a number of steps the Program will take over the next few years focused on supporting partnerships, enhancing competiveness and developing expanded capabilities to support the needs of U.S. manufacturers. More information is available here: http://www.nist.gov/mep/strategic-plan.cfm. NIST MEP launched a competition in FY2014 to fund Centers in 10 states. The competition is the first in a multiyear effort to update the funding structure to better match needs with resources in MEP's network of centers. This first competition will serve as a demonstration of the process to re-compete the full network. Additional competitions are planned for FY2015.

Objective 2.3: Strengthen the Nation's digital economy by championing policies that will maximize the potential of the Internet, expanding broadband capacity, and enhancing cybersecurity.

Strategies:

Foster advanced communications technologies. Spectrum sharing and other innovations in advanced communications will drive economic growth and development. The Department will leverage the key research and engineering expertise and capabilities of NIST and NTIA by establishing the CAC. This unique national asset will provide both research and testing capabilities. NIST and NTIA will partner with industry, academia, and government agencies to foster the invention, development, and deployment of future advanced communications technologies.

Create a standards framework to reduce cyber risks to critical infrastructure. The national and economic security of the United States depends on the reliability of critical infrastructure, including the electric grid, financial sector, and communications system. Taking full advantage of existing cross-sector security standards and guidelines, NIST is leading the development of a Cybersecurity Framework that will help critical infrastructure owners and operators to identify, assess, and manage cyber risk. NIST will support future private sector implementation of this framework.

Progress Update:

The new Center for Advanced Communications will implement a key provision of a memorandum President Obama issued on June 14, 2013, on "Expanding America's Leadership in Wireless Innovation" (http://www.whitehouse.gov/the-press-office/2013/06/14/presidential-memorandum-expanding-americas-leadership-wireless-innovatio). In support of the new CAC, NIST has established a new Communications Technology Laboratory at the Boulder campus. NIST has procured an initial set of advanced instrumentation necessary to develop required new metrology capability at NIST to support the CAC.

Cybersecurity Framework -- Under Executive Order 13636, *Improving Critical Infrastructure Cybersecurity,* NIST was charged with the responsibility to develop a voluntary framework – based on existing standards, guidelines, and practices – for reducing cyber risks to critical infrastructure. The Framework seeks to promote the wide adoption of practices to increase cybersecurity across all sectors and industry types. It seeks to provide owners and operators a flexible, repeatable and cost effective risk-based approach to implementing security practices while allowing organizations to express requirements to multiple authorities and regulators. The first version of the framework was released on February 12, 2014 (http://www.nist.gov/cyberframework/upload/cybersecurity-framework-021214.pdf). The framework is not a static document and will continue to evolve over time. Updates on framework progress can be found at: http://www.nist.gov/itl/cyberframework.cfm.

In the fall of 2013, former NIST Director requested that NIST's primary advisory committee, the Visiting Committee on Advanced Technology (VCAT) review NIST's cryptographic standards and guidelines development process, in response to community concerns that a cryptographic algorithm in a NIST standard had been deliberately weakened. The findings, part of NIST's broader review in this area, called for the Bureau to increase its staff of cryptography experts and implement more explicit processes for ensuring openness and transparency to strengthen its cryptography efforts.

Next Steps:

As part of the initial efforts of the CAC, NIST and NTIA are working to finalize a partnership with DOD and other Federal agencies to ensure that the government has timely access to spectrum testing capabilities in order to help facilitate the development of new spectrum sharing technologies and to streamline their deployment.

NIST is continuing to update the Cybersecurity Framework, improving it based on feedback from users' experiences, while new standards, guidelines, and technology assist with implementation and future versions of the Framework. In addition, NIST is continuing significant industry engagements to ensure the Framework's adoption by critical infrastructure and other companies. NIST provided an update to the VCAT on the progress of their specific recommendations during their October 2014 meeting. Additional information is available from the presentations provided to the VCAT available at: http://www.nist.gov/director/vcat/upload/Cyber-VCAT-2014-10_final.pdf.

Objective 2.4: Accelerate the development of industry-led skills strategies that result in a productive workforce for employers and high-quality jobs for workers.

Strategies:

Implement industry-driven initiatives that provide U.S. workers with in-demand skills. Many unemployed or underemployed workers lack the skills that businesses need to fill the millions of open jobs across the Nation. NIST will capitalize on its relationships with businesses and state and local governments to champion and support employer-aligned skills programs. Through MEP's national system of centers,

NIST will support and promote programs that identify the future hiring needs of small manufacturers and expose young people to STEM (science, technology, engineering, mathematics) fields.

Progress Update:

NIST MEP, in collaboration with MEP centers, is developing a talent management system - Strategic Management Acquisition and Retention of Talent (SMARTalent). SMARTalent is intended to help manufacturers operationalize their workforce development strategies. As manufacturers focus on workforce planning and investment, this resource, in combination with the expertise of the local MEP center, can help most effectively operationalize investments with the objective to enable manufacturers to eliminate task redundancies and streamlines processes.

MEP also supports industry efforts to respond to a long-standing issue for recruiting new talent for small manufacturers – public image of manufacturing. To help re-brand manufacturing and inform education providers and the general public about advanced manufacturing, MEP is reaching out through social media, publications, conferences, presentations, partnerships and direct Center involvement to change the image of manufacturing. All workforce initiatives and activities are shared across the MEP network.

MFG Day (http://www.mfgday.com/), co-produced by NIST MEP, Fabricators and Manufacturers Association, National Association of Manufacturers, The Manufacturing Institute, along with the Science Channel and Shell Oil, showcases a nation-wide number of activities, open houses and events to interest the public in manufacturing and the importance the industry plays in the U.S. economy. On October 3, 2014, more than 1600 events took place across the county in support of MFG day and providing manufacturers an opportunity to highlight their industry.

Next Steps:

NIST MEP has a number of initiatives that enable small and medium-sized manufacturers to improve their workforce development strategies. These include, in addition to SMARTalent, strategic consulting, training and education partnerships, workforce readiness, and business stabilization. More information on MEP's workforce strategies is available here: http://www.nist.gov/mep/workforce-initiatives.cfm.

NIST MEP along with the co-producers are working to address common misperceptions about manufacturing by supporting MFG Day. By working together during and after MFG DAY, manufacturers will begin to address the skilled labor shortage they face, connect with future generations, take charge of the public image of manufacturing, and ensure the ongoing prosperity of the whole industry.

Objective 2.5: Accelerate growth of innovation-intensive economic sectors by building public and private capacity to invent, improve, and commercialize new products and services.

Strategies:

Develop and provide next-generation measurement tools and standards. Precise measurements and robust standards are critical for an innovative high-technology economy and provide the foundations for interoperability between products and systems, enabling global trade. In close cooperation with industry, academia, and other federal agencies, NIST will advance measurement science, develop standard protocols and test methods, and evaluate and generate data supporting innovative areas of the economy. NIST's connections with private sector standards developing organizations will help ensure that new and updated standards have strong technical underpinning.

Build research capacity in emerging areas of research to meet tomorrow's challenges. Technological innovation is accelerating at a pace unprecedented in human history, and the continued competitiveness of U.S. industries will require breakthroughs in measurement science in all disciplines. Through the Centers of Excellence Program, NIST will partner with leaders in academia and industry to augment internal research programs and develop access to leading talent, ensuring that the Agency can meet future measurement science needs.

Accelerate rate of lab-to-market commercialization. A wide range of life-changing commercial technologies were nurtured by federally funded R&D, from the Internet, to the global positioning system (GPS), to leading-edge vaccines. The federal R&D enterprise must continue to support fundamental research and diffuse this knowledge through open data and publications. Through streamlined processes and increased engagement with entrepreneurs, DOC will facilitate industry access to federal laboratories and federally funded research.

Progress Update:

Investments to grow and strengthen the NIST Laboratory Programs have been the top priority of the agency for the past several years and as a result funding for the NIST Laboratory Programs has increased by 37% from FY 2010 through FY 2014. These increased resources have enabled NIST to launch a number of key programs to further accelerate innovation in a number of critical priority areas. Highlights include:

- NIST on a Chip -- NIST is developing a next-generation plan for advancing measurement services, called NIST on a Chip. NIST on a Chip is an integrated program to develop and deploy NIST-traceable measurements and physical standards that are deployed in the customer's lab, factory floor, device, or system; are easily used and integrated; are rugged, yet small in size and weight; and have low power consumption. As the reference standard is integrated into the device or process, many of the difficulties of the traditional measurement service model can be overcome, including minimal down time and recalibration, as well as improved flexibility for innovation. Measurement technologies include force, fluid flow, pressure, length, voltage, current, magnetic field, time and frequency, optical power, displacement, and electric field. Examples of work in this area can be found at: http://www.nist.gov/pml/newsletter/

- Centers of Excellence -- In FY 2013, NIST launched the NIST Centers of Excellence (COE) Program. The NIST Centers of Excellence will provide an interdisciplinary environment where researchers from NIST, academia, and industry will collaborate on emerging areas of basic and applied research and innovations in measurement science. These centers will focus on:
  - Fostering expanded development of expertise in measurement science and its role in innovation through the education and training of scientists and engineers;
  - Providing greater opportunities for NIST to engage with industry and entrepreneurs; and
  - Enhancing technical innovation through earlier alignment of measurement science with emerging and innovative fields of research.

  In FY2014 NIST established the COE in advanced materials, the Center for Hierarchical Materials and Design (CHiMaD), a partnership between Northwestern University, University of Chicago, and Argonne National Laboratory. The new center will focus on developing the next generation of computational tools, databases and experimental techniques to enable "Materials by Design*," one of the primary goals of the administration's Materials Genome Initiative (MGI). "Materials by design" employs physical theory, advanced computer models, vast materials properties databases and complex computations to accelerate the design of a new material with specific properties for a particular application.

  NIST also launched two federal funding opportunities for a COE in Community Resilience, and on focused on Forensic Science. More information about NIST's Center of Excellence Program can be found here: http://www.nist.gov/coe/

- Technology Transfer -- NIST, with its government-wide responsibilities for the analysis, planning, coordination, reporting, and general oversight of Federal technology transfer responsibilities is ideally positioned to support an Administration-wide effort in this area. NIST is strengthening its Federal tech transfer activities through developing human capital, empowering effective collaborations, opening access to tangible and intangible assets, and evaluating impact.

Next Steps:

In early FY2015 NIST will award two new Centers of Excellence in Community Resilience and Forensic Science. NIST will leverage these COEs to build technical capabilities in areas of national need at a scale and pace not available through traditional means.

NIST is part of an administration-wide Cross-Agency Priority Goal on technology transfer. For updates and plans on that goal, see www.performance.gov.

The National Research Council conducts technical assessments of the scientific impact of selected NIST laboratories on a yearly basis. For FY 2014, the NRC conducted technical assessments of the scientific impact of the Engineering Laboratory and the Material Measurement Laboratory with a focus on the following criteria: the technical quality and merit of the laboratory programs relative to the state-of-the-art worldwide, the effectiveness with which the laboratory programs are carried out and the results disseminated to customers, the relevance of the laboratory programs to the current and future needs of stakeholders, and the adequacy of the facilities and laboratory equipment to

perform the program functions. In FY 2015, the NRC will assess the scientific impact of the Information Technology Laboratory and the Physical Measurement Laboratory. These assessments can be found here: http://nist.gov/director/nrc/

NIST also works with its Visiting Committee on Advanced Technology to identify priority areas and to help shape and define the NIST role in those areas. The current VCAT report can be found at: http://www.nist.gov/director/vcat/.

Objective 3.1: Advance the understanding and prediction of changes in the environment through world class science and observations.

Strategies:

Improve the understanding of greenhouse gas processes. As the effects of increased greenhouse gas become more apparent, there is a growing need for a better understanding of the processes that cause the increase. The National Oceanic and Atmospheric Administration (NOAA) and NIST will work cooperatively to link measurements and standards supporting the atmospheric and emissions monitoring communities. The efforts of both bureaus will advance measurement capabilities of the monitoring networks and improve measurements of greenhouse gas emissions on scales ranging from the global to metropolitan areas and cities.

Progress Update:

NIST has funded cooperative agreements furthering research efforts to sustain and expand greenhouse gas (GHG) measurements test beds in the U.S. currently located in Indianapolis, Ind. and Los Angeles, Calif. The Indianapolis testbed, begun in 2011, is a greenhouse gas observing network within and around the city with 12 real-time observing locations on communications, 6 of which are capable of collecting samples for later analysis, as well as other instrumentation. The research testbed in Los Angeles was started in 2012 and is ramping up an operation network of up to 15 observing stations in and around the South Coast Air Basin with unique challenges in population density and geographic topography.

Next Steps:

NIST Greenhouse Gas and Climate Science Measurements Program will develop advanced measurement tools and standards to improve the accuracy and capability for remote observations of greenhouse gas, both satellite and surface-based with an emphasis on cities and metropolitan areas. The program will independently verify greenhouse gas emissions inventories, and extend measurement science to better understand and describe the Earth's climate. The program will also enable international measurement standards and protocol developments that ensure accuracy, confidence, and reliability of local and global assessments of GHG emissions.

Objective 3.3: Strengthen the resiliency of communities and regions by delivering targeted services to build capacity.

Strategies:

Lead the development of a Disaster Resilience Framework. To protect critical infrastructure and public resources, NIST will lead the development of a Disaster Resilience Framework for building and infrastructure resilience. The framework will apply to many types of hazards (e.g., tornadoes in the Midwest and earthquakes on the West Coast). A Disaster Resilience Standards Panel convened by NIST will further refine the framework and identify model resilience guidelines to put the framework into action. This national effort will require significant engagement with stakeholders and federal agencies, including NOAA, the Department of Homeland Security (DHS), the Federal Emergency Management Agency, the U.S. Geological Survey (USGS), the Department of Transportation (DOT), the Department of Housing and Urban Development, and the National Science Foundation (NSF).

Progress Update:

The President's Climate Action Plan (issued in June 2013) directs NIST to convene a panel on disaster-resilience standards to develop a comprehensive, community-based resilience framework and provide guidelines for consistently safe buildings and infrastructure—products that can inform the development of private-sector standards and codes. To accomplish this, NIST is convening a series of regional workshops engaging the broad network of stakeholders on the role that buildings and infrastructure lifelines play in ensuring community resilience. In FY 2014, NIST held workshops in Washington, DC and Hoboken, NJ with plans to hold several more in FY2015. Based on the initial workshop results, NIST has starting developing a working draft Disaster Resilience Framework to establish the overall performance goals; assess existing standards, codes, and practices; and identify gaps that must be addressed in order to bolster community resilience.

Next Steps:

NIST plans to release the Disaster Resilience Framework for public comment in April 2015. This document will be the starting point to establish a Disaster Resilience Standards Panel (DRSP). The DRSP will be a self-governing body, supported by NIST, which will meet regularly to put the framework into action.

In FY 2014, the NIST VCAT was briefed on the NIST Resilience Initiative program to help shape and define the NIST role in this national priority area. The Committee will be developing specific recommendations to position NIST to best respond to different priority areas. These recommendations will be provided in the VCAT's 2014 Annual Report. The current report can be found at: http://www.nist.gov/director/vcat/.

The National Construction Safety Team (NCST) Advisory Committee advises NIST on carrying out investigations of building failures conducted under the authorities of the NCST Act. Members are selected based on their technical expertise and experience, established records of distinguished professional service, and their knowledge of issues affecting NIST studies. The NCST Advisory Committee submits a report to Congress annually.

Objective 4.1: Transform the Department's data capacity to enhance the value, accessibility and usability of Commerce data for government, business and the public.

Strategies:

Expand data interoperability across Commerce, and expand open data access and dissemination. The Department will use a standards approach to develop an interoperable Commerce Data Infrastructure. Adherence to a set of common standards and architecture would result in a powerful data platform that provides universal access to data in usable form. Improving discovery and analysis by enhancing access will make data produced by Commerce more effective. Usable open data will promote economic growth and energize a data-as-a-service marketplace for entrepreneurs, new businesses, and the public. This infrastructure and its enabling standards will be developed in a close collaboration between the public and private sectors.

Drive the development of Big Data standards and measurement science. The availability of vast data resources carries the potential to answer questions previously out of reach. There is also broad agreement that Big Data will overwhelm traditional approaches. The rate at which data volumes, speeds, and complexity are growing is outpacing scientific and technological advances in data analytics, management, transport, and more. A lack of consensus on some important, fundamental questions will confuse potential users and hold back progress. What are the attributes and characteristics that define Big Data environments? What are the central scientific, technological, and standardization challenges that need to be addressed to accelerate the deployment of robust Big Data solutions? NIST will drive advancements in Big Data standards by forming communities of interest from industry, academia, government, and other standards bodies, with the goal of developing consensus definitions, taxonomies, secure reference architectures, and a technology roadmap.

Progress Update:

In response to the Office of Management and Budget (OMB) Memorandum M-13-13 "*Open Data Policy- Managing Information as an Asset*" and Office of Science and Technology Policy (OSTP) Memo Feb. 2013 "*Increasing Access to the Results of Federally-Funded Scientific Research,* NIST has established a Scientific Data Committee[1] (SDC) to serve as a resource to NIST laboratories and the NIST Director's office on data preservation and access standards, technologies, metadata issues, and implementation priorities, processes, performance measures, and strategies for the preservation of and access to digital scientific data at NIST. As of October 1, 2014, NIST will create data management plans for scientific data generated at NIST. Additionally, an Interagency Technical Advisory Group (iTAG) with members from NIST, the Census Bureau, DOE, the Department of Treasury, the National Archives and Records Administration, and the Smithsonian has been established to provide a forum for Federal agency and entity coordination on operational requirements and insights on how to maximize access to scientific and technical data.

[1] http://inet.nist.gov/pao/upload/NIST-Scientific-Data-Committee-Charter.pdf

On June 19, 2013, the NIST Big Data Public Working Group (NBD-PWG) was launched with participation from industry, academia, and government across the nation. The NBD-PWG will form a community of interest from all sectors including industry, academia, and government, with the goal of developing a consensus in definitions, taxonomies, secure reference architectures, and a technology roadmap. The NBD-PWG has created five subgroups: Definitions and Taxonomies, Use Case and Requirements, Security and Privacy, Reference Architecture, and Technology Roadmap. These subgroups have developed a set of consensus working drafts.

Next Steps:

The NIST/SDC Open Data Plan has three elements. The first element is to develop and pilot an extensible data registry that describes data sets using common metadata and uses persistent identifiers to provide access to those NIST digital objects regardless of their physical location; the second element is to develop and pilot a tool to help NIST-funded researchers plan for data management at the beginning of each project; and the third is to conduct training and outreach to make data providers aware of their responsibilities and data consumers aware of available data assets. NIST has established a Data Coordinator and a Data policy group to oversee these efforts.

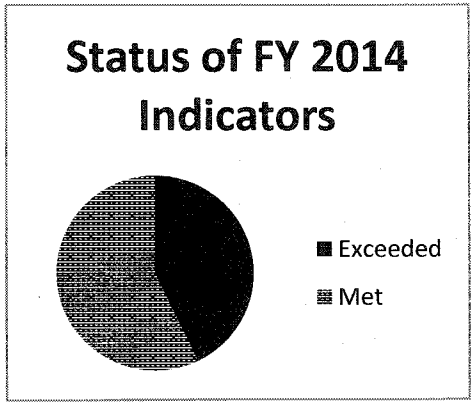
NIST will lead the NBD-PWG to create a vendor-neutral, technology and infrastructure agnostic framework which would enable Big Data stakeholders to pick-and-choose best analytics tools for their processing and visualization requirements on the most suitable computing platform and cluster while allowing value-added from Big Data service providers.

Part 4 Performance Goals / Indicators

Section 4.1: Summary of Performance

Status of indicators

For FY 2014, NIST has met or exceeded all the targets set for its performance indicators. NIST will not have data on one indicator, Citation Impact of NIST–Authored Publications, until March 2015. This indicator is not included in the chart to the right.



Trends of Indicators

In FY 2014, NIST adopted a set of performance indicators that better reflect NIST's role in responding to national priorities, the current research agenda and support for DOC strategic goals and objectives. NIST does not have historical data on these new measures and therefore cannot provide trend indicators.

Section 4.2: Summary of Indicator Performance

Objective 2.1: Grow a more productive, agile, and high-value manufacturing sector through partnerships and collaborations that accelerate technology development and commercialization

Indicator	Target	Actual	Status	Trend
Industry use of NIST research facilities	215	375 (partial data)	Exceeded	Not enough data

Objective 2.2: Increase the capacity of U.S. regional economies to accelerate the production of value-added goods and services by providing services to and investments in businesses and communities

Indicator	Target	Actual	Status	Trend
Number of firms receiving in-depth technical assistance from MEP centers	8340	8353	Exceeded	Not enough data
Percentage of MEP clients receiving in-depth technical assistance that increase their competitiveness	60%	58%	Met	Not enough data

Objective 2.3: Strengthen the nation's digital economy by championing policies that will maximize the potential of the Internet, expanding broadband capacity, and enhancing cybersecurity

Indicator	Target	Actual	Status	Trend
Number of products integrating the Cybersecurity Framework	10	10	Met	Not enough data
Number of citations of the Cybersecurity Framework	10	10	Met	Not enough data

Objective 2.4: Accelerate the development of industry-led skills strategies that result in a productive workforce for employers and high-quality jobs for workers

Indicator	Target	Actual	Status	Trend
Number of MEP centers partnering with skills training providers (e.g., community colleges) to link manufacturing firms with skills training resources.	50	54	Exceeded	Not enough data

Objective 2.5: Accelerate growth of innovation-intensive economic sectors by building public and private capacity to invent, improve, and commercialize new products and services

Indicator	Target	Actual	Status	Trend
Citation impact of NIST-authored publications	1.5	Available March 2015	N/A	Positive
Milestones completed for Commerce interoperability framework	Complete CIF/CAP and prototype and pilot at NIST	Complete	Met	Not enough data

Section 4.3 Detailed Indicator Plans and Performance

Objective 2.1: Grow a more productive, agile, and high-value manufacturing sector through partnerships and collaborations that accelerate technology development and commercialization

Indicator	Level of co-investment by non-federal sources in DOC-supported NNMI institutes (millions)							
Description	This indicator reflects how well the focus area of the National Network for Manufacturing Innovation (NNMI) Institutes matches a real national need and is intended to measure the extent to which the industrial partners perceive that they are receiving value from the existence of the Institute. Non-federal partners dedicate resources when they believe that there will be economic benefit. Non-federal sources include industry partners of all sizes, state and local governments, economic development entities, institutions of higher education, private organizations and individuals. Investment includes cash and in-kind resources provided.							
	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016
Target	N/A	N/A	N/A	N/A	N/A	$0	$0	$6
Actual	N/A	N/A	N/A	N/A	N/A	$0		
Status	N/A	N/A	N/A	N/A	N/A	Met		
Trend	Not Enough Data							
Actions to be taken /	Continue to track proposed NNMI legislation. Adjustments will be made to targets if the program receives							

Future Plans	authorization and appropriated funding.
Adjustments to targets	FY2015 target reduced from $6M to $0 to reflect the lack of a Congressionally authorized and appropriated program in FY14.

Validation and Verification	
Data Source	Proposal letters of commitment and project reporting
Frequency	Annual
Data Storage	Electronic and paper at NIST Advanced Manufacturing Program Office
Internal Control Procedures	Data reflects direct and verifiable counts. Internal controls include verification and review by NIST Advanced Manufacturing Program Office and Grants Management Division personnel.
Data Limitations	Data will likely not reflect all non-federal contributions to the institute
Actions to be Taken	None

Indicator	Industry use of NIST research facilities
Description	This indicator reflects the value, relevance, and usefulness of NIST research facilities to industry users. NIST research facilities are unique capabilities that can be leveraged through partnerships with businesses, especially manufacturers, to accelerate discovery and commercialization of innovative products. This indicator counts the number of Cooperative Research and Development Agreements (CRADAs) between industry and NIST laboratories, as well as the number of industrial institutions that use the NIST user facilities (NIST Center for Neutron Research and the Center for Nanoscale Science and Technology).

	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016
Target	N/A	N/A	N/A	N/A	N/A	215	225	250
Actual	N/A	N/A	N/A	N/A	N/A	375*		
Status	N/A	N/A	N/A	N/A	N/A	Exceeded		
Trend	Not Enough Data							

Notes	Data from the NIST Center for Neutron Research (NCNR) and the Center for Nanoscale Science and Technology (CNST) lag due to the time it takes for industry participants to publish in peer-reviewed publications. *Partial FY2014 data. Final data will be available in March 2015.
Information Gaps	Data may not include all instances of industry use of NIST research facilities indirectly through support of academic research.

Validation and Verification	
Data Source	NIST Technology Partnerships Office, NIST Center for Neutron Research, Center for Nanoscale Science and Technology
Frequency	Ongoing
Data Storage	NIST Technology Partnerships Office, NIST Center for Neutron Research, Center for Nanoscale Science and Technology
Internal Control Procedures	Data represents direct and verifiable counts. Internal controls include verification and review by NIST Technology Partnerships Office, NIST Center for Neutron Research, Center for Nanoscale Science and Technology, and the NIST Program Coordination Office
Data Limitations	Data does not reflect scope of partnership (i.e., whether one experiment or an ongoing, multifaceted investigation). NCNR data reflects a period of August – July 2014.
Actions to be Taken	None

Objective 2.2: Increase the capacity of U.S. regional economies to accelerate the production of value-added goods and services by providing services to and investments in businesses and communities

Indicator	Number of firms receiving in-depth technical assistance from MEP centers							
Description	Number of client firms receiving services from MEP centers where those services were substantial and essential and therefore could reasonably be assumed to have directly or entirely led to the impacts reported through the MEP client survey.							
	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016
Target	N/A	N/A	N/A	N/A	N/A	8340	8750	9187
Actual	N/A	N/A	N/A	7614	8140	8353		
Status	N/A	N/A	N/A	N/A	N/A	Exceeded		
Trend	Not Enough Data							
Notes	FY 2013 data was preliminary and has been updated.							
Validation and Verification								
Data Source	MEP center project reporting							
Frequency	Quarterly							
Data Storage	Manufacturing Extension Partnership office							
Internal Control Procedures	Review and verification by Manufacturing Extension Partnership office personnel							
Data Limitations	Output measure only							
Actions to be Taken	None							

Indicator	Percentage of MEP clients receiving in-depth technical assistance that increase their competitiveness							
Description	Percentage of MEP clients receiving in-depth technical assistance that reported increasing sales, reducing costs, or making new investments as a result of the services received.							
	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016
Target	N/A	N/A	N/A	N/A	N/A	60%	62%	64%
Actual	N/A	N/A	N/A	61%	58.5%	58%		
Status	N/A	N/A	N/A	N/A	N/A	Met		
Trend	Not Enough Data							
Notes	FY 2013 data was preliminary and has been updated.							
Validation and Verification								
Data Source	The client impact survey is administered by a private firm, Fors Marsh Group, located in Arlington, Va.							
Frequency	The survey is conducted four times per year, and clients are selected based on when they completed the first project with a MEP Center in the previous year.							
Data Storage	Survey data is sent directly to MEP for analysis. MEP reviews and stores survey data received from Fors Marsh Group.							
Internal Control Procedures	Internal controls include verification and significant review of the client responses by MEP staff. Criteria are in place for identifying outliers in the data. Centers verify the outlier and if necessary the data are revised based on the Center review.							

Data Limitations	As with similar survey instruments, sources of uncertainty include variation in interpretation of specific questions; in the estimation techniques used in response to specific questions; in the quality of industry data, missing values; and other common survey problems.
Actions to be Taken	None

Objective 2.3: Strengthen the nation's digital economy by championing policies that will maximize the potential of the Internet, expanding broadband capacity, and enhancing cybersecurity.

Indicator	**Number of critical infrastructure sectors with work products integrating the Cybersecurity Framework**							
Description	This indicator demonstrates that NIST consistently produces useful and relevant cybersecurity publications and reference materials that organizations representing or participating in a diverse set of the sixteen total critical infrastructure sectors can use. The Cybersecurity Framework may be cited in professional journals; international/national/industry standards, guidelines, and practices; sector-specific federal agency guidance to industry; and commercial/government-off-the-shelf software.							
	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016
Target	N/A	N/A	N/A	N/A	N/A	10	12	13
Actual	N/A	N/A	N/A	N/A	N/A	9		
Status	N/A	N/A	N/A	N/A	N/A	Met		
Trend	Not Enough Data							
Validation and Verification								
Data Source	Information Technology Laboratory research and stakeholder outreach							
Frequency	Ongoing							
Data Storage	Information Technology Laboratory							
Internal Control Procedures	Definition of critical infrastructure and specification of the 16 critical infrastructure sectors from in Presidential Policy Directive (PPD) 21, *Critical Infrastructure Security and Resilience* (http://www.whitehouse.gov/the-press-office/2013/02/12/presidential-policy-directive-critical-infrastructure-security-and-resil).							
Data Limitations	With a focus on the specified critical infrastructure sectors, this measure does not include cross-sector work products, non-critical infrastructure sectors (eg, retail), international entities, or government agencies (beyond government facilities).							
Actions to be Taken	None							

Objective 2.4: Accelerate the development of industry-led skills strategies that result in a productive workforce for employers and high-quality jobs for workers

Indicator	**Number of MEP centers partnering with skills training providers (e.g., community colleges) to link manufacturing firms with skills training resources.**
Description	This indicator reflects the number of MEP centers involved in activities supporting the development of a workforce with industry-aligned skills. MEP is working with partners throughout the national network of centers to provide the tools, services, and connections necessary

	to develop a workforce with industry-aligned skills.							
	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016
Target	N/A	N/A	N/A	N/A	N/A	50	55	55
Actual	N/A	N/A	N/A	N/A	N/A	54		
Status	N/A	N/A	N/A	N/A	N/A	Exceeded		
Trend	Not Enough Data							
Notes	All Centers currently partnered with a 1) workforce investment board, 2) community college, 3) technical college, 4) university, or 5) state workforce agency are included in this count.							
Validation and Verification								
Data Source	MEP center project reporting							
Frequency	Annual							
Data Storage	Manufacturing Extension Partnership office							
Internal Control Procedures	Review and verification by Manufacturing Extension Partnership office personnel							
Data Limitations	Output measure only							
Actions to be Taken	None							

Objective 2.5: Accelerate growth of innovation-intensive economic sectors by building public and private capacity to invent, improve, and commercialize new products and services

Indicator	**Citation impact of NIST-authored publications**							
Description	This indicator demonstrates that NIST consistently produces useful and relevant scientific and technical publications and is outcome-oriented. The "relative citation impact" indicator is the ratio of the average number of citations per publication (citation rate) for all NIST publications in a year to the average citation rate for a large group of peer institutions in the world. Publications typically lag by a minimum of two years due to the time needed for research, writing, journal peer review, and publication processes.							
	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016
Target	1.1	1.1	1.1	1.1	1.1	1.5	1.5	1.5
Actual	1.7	1.7	2.0	1.8	2.3	*		
Status	Exceeded	Exceeded	Exceeded	Exceeded	Exceeded	*		
Trend	Positive							
Notes	* The FY 2014 actual for this measure will lag at least six months.							
Information Gaps	Due to the ever-changing nature of research and publication, and continual updating of the dataset used to generate these metrics, the actuals for any given year are subject to change.							
Validation and Verification								
Data Source	Thomson Reuters InCites™							
Frequency	Annual							

Data Storage	NIST
Internal Control Procedures	Internal controls include verification and review by NIST Information Services Office and the NIST Program Coordination Office
Data Limitations	Factors such as self-citations, citation circles, and multiple authorship may affect the reliability of any data of this nature.
Actions to be Taken	None.

Indicator	**Milestones completed for Commerce interoperability framework**							
Description	NIST will, in collaboration with other agencies, develop an interagency reference architecture and Commerce Interoperability Framework (CIF) or Common Access Platform (CAP).							
	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016
Target	N/A	N/A	N/A	N/A	N/A	Complete CIF/CAP and prototype and pilot at NIST.	Expand CIF/CAP pilot to include additional bureaus/ agencies	Extend CIF/CAP pilot to enable datasets communication and access among identified agencies
Actual	N/A	N/A	N/A	N/A	N/A	Complete		
Status	N/A	N/A	N/A	N/A	N/A	Met		
Trend	Not Enough Data							
Notes	The CIF prototype is complete at NIST. NIST is piloting the CIF at the Census Bureau instead of NIST because Census has more mature data streams and more well-defined needs. NIST is on-track to meet 2015 milestones.							

Validation and Verification	
Data Source	NIST Information Technology Laboratory
Frequency	Ongoing
Data Storage	NIST Information Technology Laboratory
Internal Control Procedures	Internal controls include review by Information Technology Laboratory personnel
Data Limitations	Data provides information on output levels only.
Actions to be Taken	None.

Part 5: Other Indicators

None.

Part 6: Agency Priority Goals

None

Part 7: Resource Requirements Table

NIST Resource Requirements Table*

NIST Resource Requirements (obligations in M)										
	FY 2009 Actual	**FY 2010 Actual**	**FY 2011 Actual**	**FY 2012 Actual**	**FY 2013 Actual**	**FY 2014 Actual**	**FY 2015 Estimate**	**FY 2016 Base**	**Increase/ Decrease**	**FY 2016 Request**
Objective 2.1: Grow a more productive, agile, and high-value manufacturing sector through partnerships and collaborations that accelerate technology development and commercialization.										
TIP	$50.2	$77.2	$74.2	$4.4	1.4	1.6	5.6	-	-	-
AMTech	-	-	-	-	3.0	12.6	15.0	8.2	6.8	15.0
NNMI									143.6	143.6
Labs									20.0	20.0
User Facilities	74.5	72.9	74.2	83.0	89.5	85.5	87.9	86.9	8.9	95.8
Recovery Act funds	3.9	20.1	-	-	-	-	-	-	-	-
Subtotal Funding	**128.6**	**170.2**	**148.4**	**87.4**	**93.9**	**99.7**	**108.5**	**95.1**	**179.3**	**274.4**
Direct	123.8	167.3	144.5	78.4	78.2	93.2	102.6	91.1	179.3	270.4
Reimbursable	4.8	2.9	3.9	9.0	15.7	6.5	5.9	4.0	-	4.0
Total	128.6	170.2	148.4	87.4	93.9	99.7	108.5	95.1	179.3	274.4
Subtotal FTE	**311**	**329**	**332**	**285**	**262**	**282**	**292**	**290**	**35**	**325**
Objective 2.2: Increase the capacity of U.S. regional economies to accelerate the production of value-added goods and services by providing services to and investments in businesses and communities.										
Objective 2.4: Accelerate the development of industry-led skills strategies that result in a productive workforce for employers and high-quality jobs for workers.										
MEP	112.6	126.8	129.3	130.9	118.2	122.6	154.0	131.2	9.8	141.0
Direct	111.0	124.9	128.6	129.1	117.9	122.5	154.0	131.2	9.8	141.0
Reimbursable	1.6	1.9	0.7	1.8	0.3	0.1	-	-	-	-
Total	112.6	126.8	129.3	130.9	118.2	122.6	154.0	131.2	9.8	141.0
Subtotal FTE	**70**	**78**	**83**	**89**	**74**	**71**	**80**	**80**	**-**	**80**
Objective 2.3: Strengthen the Nation's digital economy by championing policies that will maximize the potential of the Internet, expanding broadband capacity, and enhancing cybersecurity to provide a robust environment for innovation.										
Cybersecurity Framework	-	-	-	16.5	21.7	28.0	36.4	36.4	19.0	55.4

Direct	-	-	-	16.5	21.7	28.0	36.4	36.4	19.0	55.4
Reimbursable	-	-	-	-	-	-	-	-	-	-
Total	-	-	-	16.5	21.7	28.0	36.4	36.4	19.0	55.4
Subtotal FTE	**-**	**-**	**-**	**6**	**18**	**22**	**44**	**46**	**40**	**86**
Objective 2.5: Accelerate growth of innovation-intensive economic sectors by building public and private capacity to invent, improve, and commercialize new products and services.										
Labs	555.5	583.7	584.0	621.4	625.9	679.5	728.2	688.0	8.9	696.9
BPEP	13.0	10.8	9.1	2.1	-	-	0.1	-	-	-
Construction and SCMMR	161.7	169.8	91.0	35.6	75.0	64.8	63.2	51.1	7.9	59.0
Recovery Act funds	121.1	455.5	4.4	7.0	1.4	-	-	-	-	-
Subtotal Funding	**851.3**	**1,219.8**	**688.5**	**666.1**	**702.3**	**744.3**	**791.5**	**739.1**	**16.8**	**755.9**
Direct	683.6	1,053.7	524.4	505.1	544.9	588.5	636.4	600.8	15.3	616.1
Reimbursable	167.7	166.1	164.1	161.0	157.4	155.8	155.2	138.3	1.5	139.8
Total	851.3	1,219.8	688.5	666.1	702.3	744.3	791.6	739.1	16.8	755.9
Subtotal FTE	**2,486**	**2,566**	**2,575**	**2,554**	**2,556**	**2,656**	**2,799**	**2,807**	**25**	**2,832**
Objective 3.1: Advance the understanding and prediction of changes in the environment through world class science and observations.										
Greenhouse Gas	2.3	8.8	9.1	9.0	8.8	11.9	13.9	13.9	-	13.9
Direct	2.3	8.8	9.1	9.0	8.8	11.9	13.9	13.9	-	13.9
Reimbursable	-	-	-	-	-	-	-	-	-	-
Total	2.3	8.8	9.1	9.0	8.8	11.9	13.9	13.9	-	13.9
Subtotal FTE	**7**	**18**	**22**	**23**	**19**	**20**	**21**	**21**	**-**	**21**
Objective 3.3: Strengthen the resiliency of communities and regions by delivering targeted services to build capacity.										
Disaster Resilience	5.4	4.2	4.3	7.2	7.1	5.7	10.4	10.4	10.0	20.4
Direct	5.4	4.2	4.3	7.2	7.1	5.6	9.6	9.6	10.0	19.6
Reimbursable	-	-	-	-	-	0.1	0.8	0.8	-	0.8
Total	5.4	4.2	4.3	7.2	7.1	5.7	10.4	10.4	10.0	20.4
Subtotal FTE	**7**	**8**	**9**	**16**	**12**	**16**	**16**	**16**	**13**	**29**

Objective 4.1: Transform the Department's data capacity to enhance the value, accessibility and usability of Commerce data for government, business and the public.										
Big Data standards	-	-	-	-	0.2	2.0	0.5	0.8	-	0.8
Direct	-	-	-	-	0.2	2.0	0.5	0.8	-	0.8
Reimbursable	-	-	-	-	-	-	-	-	-	-
Total	-	-	-	-	0.2	2.0	0.5	0.8	-	0.8
Subtotal FTE	**-**	**-**	**-**	**-**	**1**	**3**	**1**	**1**	**-**	**1**

Total Funding	**1,100.2**	**1,529.8**	**979.6**	**917.1**	**952.2**	**1,014.2**	**1,115.2**	**1,026.9**	**234.9**	**1,261.8**
Direct	926.1	1,358.9	810.9	745.3	778.8	851.7	953.4	883.8	233.4	1,117.2
Reimbursable	174.1	170.9	168.7	171.8	173.4	162.5	161.9	143.1	1.5	144.6
Total	1,100.2	1,529.8	979.6	917.1	952.2	1,014.2	1,115.3	1,026.9	234.9	1,261.8
Total FTE	**2,881**	**2,999**	**3,021**	**2,973**	**2,942**	**3,070**	**3,253**	**3,261**	**113**	**3,374**

* Dollars reflect obligations for all fund sources and exclude $1,930M National Network for Manufacturing Innovation and $300M Wireless Innovation Fund (mandatory appropriations).

Part 8: Other Information

Section 8.1: Major Management Priorities, Challenges, and Risks

NIST has had multiple actions that impact top DOC management challenges.

Challenge 1: Strengthen Commerce Infrastructure to Support the Nation's Economic Growth

Responsible Bureau Official: Under Secretary for Commerce for Standards and Technology and NIST Director

- NIST has taken a number of actions to mitigate the challenge of implementing the National Network for Manufacturing Innovation. Congress continues to make progress on the NNMI legislation. NIST has conducted planning exercises to ensure that the agency is prepared to manage the program if Congress passes authorization legislation.

Challenge 3: Continue Enhancing Cybersecurity and Management of Information Technology Investments.

Responsible Bureau Official: Under Secretary for Commerce for Standards and Technology and NIST Director

- NIST is assisting in establishing a robust capability to respond to cyber incidents. As a member of the DOC Federation of Computer Incident Response Teams, NIST participates in meetings, weekly teleconference calls, and email discussions. NIST also provides advice, consultations, and incident response assistance to other parts of DOC upon request.
- NIST is helping to continue sustainable implementation of enterprise cybersecurity initiatives by implementing Trusted Internet Connection (TIC) requirements, purchasing MTIPS services using the GSA Networx contract. NIST has also implemented the DOC Enterprise Cyber Security Monitoring and Operations infrastructure, providing enterprise continuous monitoring capabilities for all DOC OUs. Also, NIST participates in all of the planning activities and working groups involved with the implementation of the DOC Enterprise Security Oversight Center.
- NIST is maintaining momentum in consolidating commodity IT to cut costs by sharing procurement vehicles – NIST uses Department-wide contracts, such as the Microsoft and McAfee contracts, for its IT commodity purchases whenever possible. NIST has also been an active participant in DOC-wide efforts to put additional shared procurement vehicles into place. A NIST employee was a member of the team that developed the Network Equipment strategic sourcing vehicles. NIST tests new Dell desktop and laptop devices for inclusion in the DOC-wide PCs and Accessories Custom User Purchasing Agreement. Also, in FY2012 NIST established the MS Office 365 contract, which several other bureaus are using today for their migrations to Office 365.

- In addition, NIST hosts the DOC Enterprise Cyber Security Monitoring and Operations infrastructure, providing enterprise continuous monitoring capabilities for all DOC operating units.

Challenge 3: Continue Enhancing Cybersecurity and Management of Information Technology Investments.

Responsible Bureau Official: Under Secretary for Commerce for Standards and Technology and NIST Director

- NIST has been responsive to the President issued Executive Order 13636, *Improving Critical Infrastructure Cybersecurity* in February 2013. It directed the National Institute of Standards and Technology (NIST) to work with stakeholders to develop a voluntary framework in one year – based on existing standards, guidelines, and practices - for reducing cyber risks to critical infrastructure.
- NIST released the *Framework for Improving Critical Infrastructure Cybersecurity* on February 12, 2014. The Framework, created through collaboration between industry and government, consists of standards, guidelines, and practices to promote the protection of critical infrastructure. The prioritized, flexible, repeatable, and cost-effective approach of the Framework helps owners and operators of critical infrastructure to manage cybersecurity-related risk. http://www.nist.gov/cyberframework/index.cfm

Challenge 5: Continue to Foster a Culture of Management Accountability to Ensure Responsible Spending.

Responsible Bureau Official: Under Secretary for Commerce for Standards and Technology and NIST Director

- NIST's Office of Acquisitions and Agreements Management (OAAM) has made a concerted effort to improve controls over the use of Federal funds by recipients. These efforts include, but are not limited to the hiring of a Grants Division Chief; procurement of six on-site training courses for grants staff; and the completion of an internal compliance file review. In addition, NIST has created an internal task force to identify process improvement solutions for acquisitions and agreements. NIST/OAAM is confident that these multifaceted activities will improve the controls over the use of Federal funds.
- NIST/OAAM has developed comprehensive draft closeout SOPs, utilizing lessons learned from internal award closeout administration and findings and recommendations identified in the September 23, 2013 memorandum *Closeout Procedures Needs Strengthening for the Broadband Technology Opportunities Program (BTOP)*. The draft closeout SOP will be issued in Final by the end of the fiscal year. With respect to closeout activities, NIST/OAAM has closed 54.3% (57 of 105) expired BTOP awards.
- NIST has been an active participant in DOC-wide planning for migration from the DOC legacy financial systems to a Business Application Solution (BAS).

NIST Internal Management Challenge: Achieve Operational Efficiency and Economy to Support a World-class Research Program.

Responsible Bureau Official: Under Secretary for Commerce for Standards and Technology and NIST Director

- Safety management -- NIST is continuing a long process of improving safety management practices and developing a robust safety culture at the laboratories. This effort has made significant progress, but still requires management focus and priority.
- Integrating program and support functions -- NIST is undertaking a significant effort to improve how we procure goods and services. This effort will improve NIST scientific staff's ability to do their mission-critical work by focusing on timeliness, value, effort, and responsiveness. As a part of this effort, NIST managers and staff are defining processes and methodologies that will refine and streamline acquisitions.
- Budget uncertainties and travel ceilings --Current budget uncertainties pose significant risk to NIST's ability to maintain programs that improve U.S. competitiveness, particularly when other countries are increasing investments in measurements, standards, and technology development. Similarly, travel caps are reducing NIST scientists' participation in technical meetings, standards development activities, etc. Participation in these activities supports technology transfer from NIST laboratories and provides NIST staff critical insights about external competition and the science and technology landscape.
- Access to a world class workforce -- NIST's ability to perform best-in-the-world research is dependent on our ability to attract and work with world-class researchers. Foreign researchers working with NIST staff at NIST facilities are an integral part of this dynamic. Collaboration with these experts enables NIST researchers to better understand and stay on the cutting-edge of scientific developments around the world. Also, restrictions on incentives and pay increases along with general negative impressions about Federal employees continue to be a challenge in recruiting the best and brightest scientific minds in the U.S. to work at NIST and contribute to our important mission.

Section 8.2: *Cross-Agency Collaborations*

Cross-Agency Collaborations

NIST has a key coordination role in working with other agencies to help achieve its objective aimed at strengthening U.S. advanced manufacturing through partnerships and collaborations that accelerate technology development and commercialization.

- **Advanced Manufacturing** --The Nation's long-term competitiveness relies heavily on global leadership in advanced manufacturing capabilities. In support of this effort, NIST maintains key relationships with OSTP, the National Economic Council, NSF, NASA, DOE, and DOD. NIST hosts the Advanced Manufacturing National Program Office (AMNPO) which is working closely with NSF, DOD, DOE, NASA, and other agencies to coordinate federal advanced manufacturing programs and create the necessary foundation for the proposed National Network for Manufacturing Innovation (NNMI).

NIST is working closely with a number of other agencies to develop and provide measurement tools and standards to promote industrial competitiveness, enable innovation, and increase efficiency. Key examples include:

- **National Nanotechnology Initiative** -- NIST actively participates in and leads many activities within the National Nanotechnology Initiative (NNI). For example, NIST and OSTP co-chair the Nanoscale Science, Engineering, and Technology Subcommittee which is the interagency convening group of the NNI. The NNI consists of the individual and cooperative nanotechnology-related activities of 27 Federal agencies with a range of research and regulatory roles and responsibilities.
- **Materials Genome Initiative** -- NIST is a lead agency in the Administration's effort to build a materials innovation infrastructure in the U.S. This interagency activity is leveraging expertise at NIST, DOE, DOD, NSF, and other agencies to develop computational approaches that will dramatically reduce the development time of new materials for more effective and cheaper products.
- **Cybersecurity** -- NIST is playing a critical role in implementing a framework for reducing cyber risks to critical infrastructure, per the Presidential Executive Order "Improving Critical Infrastructure Cybersecurity" issued in February 2013. OMB, DHS, and the National Security Agency are key government stakeholders in this effort and are working with NIST to create a public-private partnership to develop a standards-based framework to identify and mitigate cybersecurity risks to the nation's critical infrastructure.
- **Advanced Communications** -- NIST and NTIA recently signed a Memorandum of Understanding to establish a national Center for Advanced Communications at the DOC Boulder facilities. The Center will leverage the unique NIST and NTIA technical expertise in communication technologies and will work closely with the private sector and other federal agencies, including DOD and the Federal Communications Commission. The Center will address measurement and standards challenges in the rapidly evolving communication technologies.
- **Measurement Science and Standards in Forensic Science** -- NIST works with the Department of Justice (DOJ) and forensic science practitioners to establish practices that will enable greater transparency and rigor in the use of forensic evidence within the criminal justice system. For example, NIST and DOJ recently signed a Memorandum of Understanding to create a National Commission on Forensic Science to help address important issues identified in a National Academies' report that studied the nation's forensic science approach.
- **Standards and Trade Policy** -- NIST partners with the Office of the U.S. Trade Representative on significant issues relating to trade policy and standards-related issues that impact trade policy.
- **Interoperability of Electronic Health Records (EHR)** -- NIST is working in close collaboration with the Department of Health and Human Services Office of the National Coordinator for Health IT to promote interoperability of electronic health records.
- **Biosciences** -- Ongoing collaborations between NIST and the Food and Drug Administration range from the reliability of active implanted medical devices, to biological drugs and stem cell-based therapies, to certified reference materials for dietary supplements.

Through the MEP, NIST collaborates with a number of other agencies in support of its objective to improve the competitiveness of small and medium-sized businesses. Most recently, MEP has collaborated actively with multiple other agencies (including the Economic Development Administration, the Department of Labor (DOL), the Small Business Administration (SBA), the U.S. Department of Agriculture, DoE, and the Delta Regional Authority) on priority Administration initiatives to grow the economy and create jobs. In some cases, such as with the Advanced Manufacturing Jobs and Innovation Accelerator Challenge and the Make it in America competition, MEP has been a full partner,

providing funding and leadership to help shape and implement the initiatives for maximum impact. In others, MEP has been a supportive non-funding partner, bringing our expertise and insights regarding US manufacturing to the initiatives. These recent activities are in addition to the long-standing relationships NIST MEP has had with a number of agencies and programs, including:

- **E3: Economy, Energy, and Environment** -- MEP is collaborating with DOE, the Environmental Protection Agency, DOL, SBA, and USGS on E3, a coordinated federal and local technical assistance initiative that is helping manufacturers across the nation adapt and thrive in a new business era focused on sustainability.
- **ExporTech** -- Deployed nationally as a collaboration between MEP, U.S. Export Assistance Centers, and other partners including District Export Councils, State Trade Offices, Ex-Im Bank and SBA, ExporTech helps companies enter or expand in global markets.
- **Supplier Scouting** -- In partnership with DOT, DOE, DOD, and other NIST programs, MEP has been using its extensive network of manufacturers and suppliers to help American companies meet the requirements of the Buy America and Buy American standards.

Section 8.3: *Evidence Building*

NIST continually collects information on major national issues, shifting trends in science and technology, and the performance of key operational processes through a variety of mechanisms including meetings, workshops, industry visits, and objective peer review of its programs. This input is viewed in the context of the NIST mission to make decisions on where NIST needs to develop specific capabilities, how to best marshal existing resources to address current issues, and how to continually optimize the organization for improved performance.

The NRC provides expert assessments of the NIST Laboratory programs. The NRC assessments assure decision-makers within the Federal government that NIST maintains the highest standards of effort, performance, and relevance. The assessments also help NIST respond to recommendations and advice as provided to NIST by its advisory body, the Visiting Committee on Advanced Technology. In addition, the process of bringing expert NRC panelists to the NIST campus creates an opportunity for NIST scientists to obtain direct feedback and to foster professional relationships with experts in their field. For FY 2014, the NRC conducted technical assessments of the scientific impact of the Engineering Laboratory and the Material Measurement Laboratory on the following criteria: the technical quality and merit of the laboratory programs relative to the state-of-the-art worldwide, the effectiveness with which the laboratory programs are carried out and the results disseminated to customers, the relevance of the laboratory programs to the current and future needs of stakeholders, and the adequacy of the facilities and laboratory equipment to perform the program functions. The most recent NRC reports are available here: http://nist.gov/director/nrc/

The NIST Visiting Committee on Advanced Technology (VCAT) assessed NIST's programs and priorities, with specific focuses on NIST's portfolio of manufacturing programs, as well as NIST's cybersecurity efforts. Their recommendations are included in the *2013 Annual Report,* as well as their report on *NIST Cryptographic Standards and Guidelines Process* at: http://www.nist.gov/director/vcat/. In addition to

the VCAT, NIST has other federal advisory committees that provide critical advice for other key NIST programs, including Advisory Committee on Earthquake Hazards Reduction, the Board of Overseers for the Malcolm Baldrige Award, the Information Security and Privacy Advisory Board, and the Manufacturing Extension Partnership Advisory Board.

NIST MEP uses a broad array of research and reports to shape its program direction. These include client surveys, Federal Advisory Committee reports, and National Academy of Sciences reports. For more information, see the MEP website at http://nist.gov/mep/.

Section 8.4: Hyperlinks

The NRC Assessment Reports for NIST are available at: http://www.nist.gov/director/nrc/index.cfm.
A variety of performance evaluation and economic studies are available at: http://nist.gov/director/planning/impact_assessment.cfm

Section 8.5: Data Validation and Verification

The FY 2014 Summary of Performance and Finance Information includes in the Secretary's Statement, an assessment of the reliability and completeness of the Department's performance data.

Section 8.6: Lower-Priority Program Activities

The President's Budget identifies the lower-priority program activities, where applicable, as required under the GPRA Modernization Act, 31 U.S.C. 1115(b)(10). The public can access the volume at: http://www.whitehouse.gov/omb/budget.