U.S. DEPARTMENT OF COMMERCE

TECHNOLOGY ADMINISTRATION

Technology Administration

Mission Statement

The Technology Administration's (TA) mission is to work with American industry to maximize technology's contribution to U.S. economic growth by maintaining and improving key components of the nation's technological infrastructure; fostering the development, diffusion, and adoption of new technologies and leading business practices; creating a business and policy environment conducive to innovation; and disseminating technical information.

TA works with U.S. industry to maximize technology's contribution to American economic growth, job creation, innovative capacity and global competitiveness. TA serves as a policy portal for the technology community to the executive branch. Led by the Under Secretary for Technology, TA fulfills its broad responsibilities through its component organizations: the Office of Technology Policy (OTP), the National Institute of Standards and Technology (NIST), and the National Technical Information Service (NTIS).

Overview of Component Bureaus

Office of Technology Policy (OTP)

Through analytical reports and memoranda, briefings and congressional testimony, OTP provides national, state, and local policymakers with information and deeper understanding of trends and policy implications of new technologies, business models and practices, and the implications for U.S. competitiveness of technology policy issues. OTP serves as the U.S. Government's technology ambassador, serving as industry's portal to the Federal Government, frequently meeting with innovation leaders and entrepreneurs to better understand their needs and concerns and to represent Administration technology policies and agenda. OTP also assists others across America – from managers of traditional industries to regional economic development leaders to middle school students – to better understand and appreciate the importance of technology and innovation to America's future. In its advocacy role, OTP helps shape policies that support a vibrant national innovation infrastructure and the interests of entrepreneurs and technologists in federal policy-making circles. OTP advocates United States technology policy and its implementation at bilateral meetings and in agreements between the U.S. and numerous foreign governments and international entities. OTP also advocates the importance of innovation and rapid technology adoption among private sector leaders (such as manufacturers, researchers, and executives).

National Institute of Standards and Technology (NIST)

NIST operates under the authority of the National Institute of Standards and Technology Act (15 U.S.C. 271), which modifies The Organic Act that created the National Bureau of Standards (NBS) in 1901. In 1988, Congress renamed NBS as NIST, and also established the Regional Centers for the Transfer of Manufacturing Technology (15 U.S.C. 278k) and the Advanced Technology Program (ATP) (15 U.S.C. 278n). The National Quality Program was established and its functions were assigned to NIST by the Malcolm Baldrige National Quality Improvement Act of 1987 (15 U.S.C. 3711a).

NIST develops and disseminates measurement techniques, reference data, test methods, standards, and other infrastructural technologies and services required by U.S. industry to innovate and compete in global markets. In addition to its core measurement, testing, and standards functions, NIST also conducts several extramural programs, including the ATP, to stimulate the development of high-risk, broad-impact technologies by U.S. firms; the Manufacturing Extension Partnership, to help smaller firms adopt new manufacturing and management technologies; and the Baldrige National Quality Program (BNQP), to help U.S. businesses and other organizations improve the performance and quality of their operations by providing clear standards and benchmarks of quality. For each NIST program, a performance logic model describing the chain of value-creation from inputs to end-outcomes, and the linkages to performance evaluation methods between each stage of the impact path are presented below with respect to each program's performance information for FY 2003.

National Technical Information Service (NTIS)

NTIS operates a central clearinghouse of scientific and technical information that is useful to U.S. business and industry. NTIS collects scientific and technical information; catalogs, abstracts, indexes, and permanently archives the information; disseminates products in the forms and formats most useful to its customers; develops electronic and other new media to disseminate information; and provides information processing services to other federal agencies, without appropriated funds. NTIS's revenue comes from (1) the sale of technical reports to business and industry, schools and universities, state and local government offices, and the public at large; and (2) from services to federal agencies that help them communicate more effectively with their employees and constituents.

Priorities/Management Challenges

OTP

OTP's overarching goal is to provide leadership in promoting national technology policies that facilitate U.S. pre-eminence in key areas of science and technology (S&T) and to leverage technological innovation to strengthen U.S. global competitiveness. Underpinning this goal are three key action areas: outreach, analysis/education, and advocacy. Throughout FY 2003, OTP adopted a strategic issue framework around three core objectives that encompass the three action areas. The framework and relationship to the three key action areas are outlined below:

Promoting Innovation – To achieve this goal, OTP, in its analysis role, conducted Federal Government-wide assessments of technology transfer activity and led interagency working groups. OTP offered guidance on national technology transfer policies that were adopted by PCAST in its 2003 reports to the President, and by the Office of Management and Budget (OMB) in its A-11 guidance to federal agencies on reporting technology transfer metrics as part of their 2005 budget submissions. During 2003, OTP developed the first comprehensive federal survey of the use of biotechnology in U.S. industry and will present an analysis of data from over 1,030 companies in the fall 2003 report. This report provides new information about biotechnology's contributions to the U.S. economy, firms' financial health and workforce structure, sources of biotechnology research and development (R&D) financing, and perceived barriers to growth. OTP works closely with U.S. biotech firms, other federal and state policymakers, leaders of biotechnology associations, state economic development agencies, and academia on this and other efforts. In furthering its innovation outreach, OTP brought together more than 80 leaders in American technology and research from industry, academia, and government to discuss U.S. innovative capacity, our strengths and weaknesses, future global challenges, and steps that the Agency might take to increase U.S. competitiveness in innovation. These roundtables helped define TA's agenda for 2003. (*This strategic issue was reworded from the FY 2002 PAR. Prior wording was "Support and improve the innovation system of the United States."*)

Advance the role technology plays in U.S. economic growth and homeland security – OTP facilitated dialogue and interaction between policymakers, developers, and users of emerging and productivity-enhancing technologies (outreach and advocacy) with the goal of promoting adoption by business, education, medicine, and research groups (education and advocacy).

Encouraging Entrepreneurship and Technology-Led Economic Development – During FY 2003, the Office of the Under Secretary (US)/OTP led the creation of the Digital Freedom Initiative (DFI), a White House initiative. TA brought together federal agencies, over 40 companies, and other groups to promote business partnerships and entrepreneurship as catalysts for economic growth. In addition, OTP teamed with the Appalachian Regional Commission to conduct workshops in a number of states to focus on the positive economic impact of broadband deployment and to assist in the development of strategies to promote broader access to and usage of broadband. OTP also conducted several seminars throughout the country through its partnership with the National Association of Seed and Venture Funds. The seminars focused on promoting technology-led economic development strategies and improving entrepreneurial networks. These seminars have reached several hundred entrepreneurs, investors, business leaders, and local policymakers from New Mexico to New Hampshire. OTP is also leading an initiative built upon collaboration between the United States and Jordanian governments and business authorities to create a privately funded, commercial S&T incubator in Aqaba, Jordan. TA also organized events in Washington and Silicon Valley to help the technology industry understand the federal procurement process and to expose federal officials to the range of security technologies being developed by U.S. companies. OTP conceived and developed a plan to create incubator/innovation hubs in developing countries that will promote R&D partnerships between U.S. and local companies and stimulate creation of policies that enable U.S. technology business initiatives. OTP finalized an agreement to cooperate with the Department of State and Sandia National Laboratories/Advanced Concept Group to initiate the program in Brazil. (This strategic issue was reworded from the FY 2002 Performance and Accountability Report (PAR). Prior wording was "*Strengthen the competitive position of U.S. technology industries.)"*

In its outreach capacity, OTP outlined an approach for U.S. industry and the S&T community to structure its workforce to embrace important policy issues such as globalization and technology-led economic development. In addition to press briefings, workshops, and roundtable discussions, OTP used electronic means to inform Congress, U.S. Government agencies, and the public about OTP analytical findings (outreach and advocacy/education).

NIST

Four of NIST's priorities for FY 2003 are reflected in the program performance information provided below: NIST's focus on technical infrastructure for twenty-first century innovation is reflected in Performance Goal 2; NIST's focus on facilitating a business environment that encourages technological innovation is reflected in Performance Goal 3; NIST's focus on opportunities for small manufacturers is reflected in Performance Goal 4; and NIST's focus on quality and accountability in business, heath care, and educational organizations is reflected in Performance Goal 5. Construction and facilities remain an independent and urgent priority for NIST, and its ability to respond to these challenges derives directly from the level of resources provided.

NTIS

NTIS' priority is to make prudent use of its joint-venture authority to reduce costs and leverage resources in efforts to enhance its acquisition and dissemination activities. Agreements were concluded with joint venture partners to optimize dissemination of, and revenue from, its World News Connection service and to establish an e-learning platform for use by federal agencies requiring a high degree of security.

Management challenges include increasing overall sales volume by raising its profile to both buyers and suppliers, while continuing to develop new lines of high-margin business using its joint-venture capabilities. New lines of business to be explored will include data warehousing/disaster recover, Web-delivered course development, and a business-to-business Web site that could make it easier for NTIS to work with business partners to deliver products via the Web, including information in the NTIS collection and its database.

FY 2003 Performance

OTP

In FY 2003, OTP had one goal and four measures, and met its performance targets. In its quest for continual improvement, during FY 2003 OTP reviewed its metrics and outlined a new approach to better evaluate its performance, focusing on activities to be completed. OTP was successful in achieving these goals.

OTP continued its efforts to support and improve the American innovation system by accomplishing its goals with respect to technology transfer. In its leadership role, TA developed and published its legislatively mandated annual report to Congress and the President on U.S. Government technology transfer activities and trends. OTP convened numerous interagency meetings, the outcome of which supported its analysis and policy advocacy efforts that led to changes to specific policies and practices under the Bayh-Dole Act. PCAST adopted OTP's recommendations for new technology transfer policies and included them in its 2003 report to the President. OMB further supported OTP's recommendations when it issued its A-11 guidance to federal agencies, requiring the reporting of technology transfer metrics as a part of each agency FY 2005 budget submission.

During FY 2003, OTP's continuing dialogue with industry, academia, and other government agencies resulted in a better definition and understanding of the use of productivity-enhancing information technologies, such as broadband Internet, in business, education, medicine, and research. Its panel discussions on emerging technologies, including biotechnology, nanotechnology, telehealth hydrogen fuel cells, and advanced educational technologies set the stage for advancing the role of technology in U.S. economic growth and homeland security by bringing to the forefront the status, opportunities, and barriers to the development and adoption of promising technology areas. This provided the focus needed for OTP's policy development efforts and led to the first U.S. Government survey of national biotechnology industries, a report on the status of telemedicine technologies, reports on technology-led economic development and educational training modules focused on developing capital and technology infrastructures for technology-led economic growth at the state and local levels.

OTP achieved its goals to strengthen the competitive position of U.S. technology industries through several efforts in FY 2003. OTP led the creation of the DFI, which brings together federal agencies, over 40 companies, and other groups to promote business partnerships and entrepreneurship as catalysts for economic growth. In addition, OTP conceived and developed a plan to create incubator/innovation hubs in developing countries that will promote R&D partnerships between U.S. and local companies and stimulate creation of policies that enable U.S. technology business initiatives.

Throughout FY 2003, OTP continued to strengthen and refine its organization, capabilities, and resources to maximize the effectiveness of its activities and services in support of the President's Management Agenda (PMA). It streamlined middle management and empowered front-line policy staffers, increased the quantity of its policy analysis by over 300 percent (via report publishing) and improved the quality and impact of its analysis. OTP increased its value and volume of outreach to industry, through direct dialogue in hundreds of meetings, roundtables, conferences, speeches and listening sessions around the country. OTP's leadership of the National Medal of Technology improved its processes this year through an e-government initiative focused on electronic submission and evaluation of nomination packages.

In addition to achieving its specific goals, TA served in leadership roles that led to the: (1) Global Standards Initiative, which TA developed to unify work done at NIST, ITA, the U.S. Trade Representative, and the State Department to promote consensus-based, industry-led, voluntary standard setting work around the world, especially in light of European Union and Asian government challenges to this system; and (2) Establishment of the Assistive Technologies Initiative in support of the President's New Freedom Initiative. TA is leading the eight-point Department of Commerce initiative to support the development of assistive technologies and to promote the U.S. assistive technology industry.

NIST

In 2003, NIST had four goals and 16 measures. Of the measures, one is qualitative (external expert peer review of the NIST laboratories), and 15 quantitative. Of the 15 quantitative measures, two involve microeconomic impact studies for two different goals. Of the 15 quantitative metrics, nine do not have final data for FY 2003 (see text below for detailed descriptions of data collection systems). NIST met the FY 2003 targets set for three of the six quantitative metrics for which FY 2003 data were available.

NIST played a critical role in accelerating the development of four American National Standards Institute (ANSI) standards in radiation and nuclear detection equipment. There was a lack of standardization among radiation and nuclear detection equipment such as handheld dose rate instruments, isotope identifiers, and portal monitors, and a strong need for standards for performance verification. Historically, the users of these devices were health physicists, who had the expertise to verify the performance of the equipment themselves, but now early and first responders, border guards, and other security personnel that lack the expertise are buying this equipment and are unable to verify their accuracy. NIST's Ionizing Radiation Division was instrumental in expediting the introduction of critical ANSI standards that establish test conditions, mechanical requirements, and engineering specifications now needed for this equipment. NIST is now assisting in the development of test and evaluation protocols for the equipment covered by the ANSI standards.

A NIST-developed concept has led to a powerful new technique for analyzing damaged or degraded DNA, a capability that will be a boon to forensic analyses conducted by law enforcement agencies and the military. The technique reduces the size of DNA fragments needed for a positive identification. It has enabled the identification of victims of the World Trade Center attack who could not be identified with conventional procedures.

NIST's leadership and diligence are credited, in a large part, with the successful development of a new broadband wireless standard, which some in the wireless industry are describing as the "next big thing." Written by an Institute of Electrical and Electronics Engineers (IEEE) working group chaired by a NIST researcher, the new IEEE 802.16a specification for wireless metropolitan area networks is viewed as a leading contender for solving the so-called "last mile problem," the challenge of delivering affordable broadband access to homes and small businesses. Equipment based on the standard will allow operators of core networks (such as public telephone network and the Internet) to offer broadband multimedia services to users who do not have access to wired connections. The standard could enable developing countries to forgo building a wired infrastructure for delivering advanced communication and information services to their general populations. In July 2003, Intel, the California-based integrated-circuit manufacturer, announced that it will make chip sets that incorporate the new standard. Also in 2003, the NIST researcher who led the standard-development effort, was honored with the Individual Governmental Vision Award of the Wireless Communications Association.

NIST-developed test and measurement methods are the cornerstones of the first-ever industry standards published for micromachines and other so-called microelectromechanical systems (MEMS). The standards, published by ASTM International, are expected to facilitate global commerce in MEMS devices, a promising, but still-emerging technology area now confined mostly to niche markets. Industry experts say they are hopeful that the new standards for measuring the

dimensions and properties of thin films used to make the devices will lead to more efficient manufacturing, improved reliability, and cheaper products. Separately, and working on even smaller scales, NIST researchers and collaborators from Hewlett-Packard reported success in completing in what well may be the first capacitance-voltage measurements of a molecular-electronic device. The achievement is a key step toward developing reliable methods for measuring the electrical behavior of electronic devices crafted from single molecules, an infant nanotechnology eyed for future integrated circuits. Although several research groups have demonstrated single-molecule devices in the laboratory, a suite of reliable measurement methods are needed to move molecular-electronics technology beyond the proof-of-concept stage.

Deborah Jin, a physicist at the NIST in Boulder, Colorado, and adjoint assistant professor of physics at the University of Colorado at Boulder, has been named a 2003 winner of a $500,000 MacArthur Fellowship, commonly known as the "genius grant." The fellowship is awarded by the John D. and Catherine T. MacArthur Foundation of Chicago. Jin created a new quantum gas that was named one of the top 10 scientific advances of the year by the journal, Science. The result was a quantum state in which atoms behave like waves. This research is a step toward a better understanding of fermions—basic building blocks of matter—and may lead toward a new generation of atomic clocks and atom lasers.

NTIS

In FY 2003, NTIS had one goal and three measures. Of those three measures, NTIS met two. Implementation of NTIS's new business model, which focuses on its mission of disseminating information and stimulating innovation and discovery, thus supporting economic growth and job creation, has been a major influence on the success of the performance measures. Despite the achievements in acquisition and dissemination activities customer satisfaction declined slightly. However, the performance measure was helpful in alerting management and as a result, the reason for the decline has been identified and corrected.

NTIS introduced a new look and feel to the home page of its very successful Web site, www.ntis.gov. The new, dynamic home page now features more product choices and increases NTIS's visibility on the World Wide Web.

NTIS is working closely with OMB, the Department of Labor (DOL), the Department of Defense, the General Services Administration and others participating in an OMB-sponsored Inter-Agency Task Force to develop a single Web site for access to federal contract labor standards information and wage determinations. The new program located at www.wdol.gov provides the public and federal contracting community ready access to wage determinations required on most federally funded construction and/or service contracts. Wage Determinations On Line is part of the Integrated Acquisition Environment, one of the e-government initiatives that makes up the PMA.

Because of NTIS's expertise and excellence in handing product distributions, the U.S. Department of Agriculture (USDA) is relying on NTIS resources more and more to manage their educational nutritional information distributions. Distribution increased by nearly five million units, from14 million units in FY 2003 and USDA anticipates an additional increase of 25 percent in FY 2004.

During FY 2003, NTIS developed, hosted, and provided technical support to assist the U.S. Customs and Border Protection (CBP), a part of the Department of Homeland Security, in providing 24/7 support for its Web site. During the latter part of FY 2003, NTIS began work with CBP to include Oracle database applications to support current and evolving CBP Web-based database applications.

With the development of the DOL/OLMS Web site finalized in FY 2002, in FY 2003, NTIS provided full hosting, maintenance, information technology (IT) and help desk support for the DOL Online Labor Management System (DOL/OLMS) Web site for Labor Management Financial Disclosure Electronic Forms, allowing 33,000 labor unions to fill in, download and/or print, or electronically file their annual financial disclosures using ACES PKI digital signature technology to DOL/OLMS Union Reports Database via this dynamic Web site.

It is also noteworthy that NTIS was able to accomplish all of these new initiatives and continue providing all existing products and services with a declining workforce. In the past three years, NTIS has lost 47 employees while filling only 17 vacancies. The reorganization of NTIS was finalized in FY 2003 and aided in streamlining operations and eliminating the need to back-fill some of the vacancies. All of the hires have been in key positions, primarily in the chief information officer area to ensure the continuation of both internal operations and to fulfill service customer agreement terms. The staff remaining has rallied together to build on existing resources and to work smarter and harder to continue providing the excellent service that NTIS's customers and service clients have grown to expect and that NTIS strives to achieve.

Targets and Performance Summary

See individual Performance Goal sections for further description of each measure.

Performance Goal 1: Promote Technology-based Growth Through Partnerships with Industry (OTP)

Measure	FY 2000 Actual	FY 2001 Actual	FY 2002 Actual	FY 2003 Target	FY 2003 Actual	FY 2003 Met	FY 2003 Not Met
Support and improve the American innovation system	New	New	Activities Completed	Activities Complete	Activities Completed	X	
Advance the role technology plays in U.S. economic growth and homeland security	New	New	Activities Completed	Activities Complete	Activities Completed	X	
Strengthen the competitive position of U.S. technology industries	New	New	Activities Completed	Activities Complete	Activities Completed	X	
Strengthen the Office of the Under Secretary/ Office of Technology Policy's (US/OTP) organization, capabilities, and resources to maximize the effectiveness of its activities and services	New	New	Activities Completed	Activities Complete	Activities Completed	X	

Performance Goal 2: Provide Technical Leadership for the Nation's Measurement and Standards Infrastructure and Ensure the Availability of Essential Reference Data and Measurement Capabilities (NIST)

Measure	FY 2000 Actual	FY 2001 Actual	FY 2002 Actual	FY 2003 Target	FY 2003 Actual	FY 2003 Met	FY 2003 Not Met
Qualitative assessment and performance evaluation using peer review	Completed	Completed	Completed	Complete	Completed	X	
Economic impact studies	Completed	Completed	Completed	Complete	Not Completed		X
Standard Reference Materials (SRM) available	1,292	1,335	1,353	1,360	1,214		X
Standard Reference Data (SRD) titles available	63	65	90	70	106	X	
Number of items calibrated	2,969	3,192	2,924	2,900	3,194	X	
Technical publications produced[1]	2,250	2,207	2,236	2,100	1,918		X

Performance Goal 3: Accelerate Technological Innovation and Development of the New Technologies that will Underpin Future Economic Growth (NIST)[2]

Measure	FY 2000 Actual	FY 2001 Actual	FY 2002 Target	FY2002 Actual	FY 2003 Target	FY 2003 Actual	FY 2003 Met	FY 2003 Not Met
Economic impact studies	Completed	Completed	Completed	Completed	Complete	Completed	X	
Cumulative number of technologies under commercialization[7]	166	195	190	244	210	Available in the FY 2004 PAR		
Cumulative number of publications[7]	565	747	770	969	860	Available in the FY 2004 PAR		
Cumulative number of patents filed[7]	693	800	930	939	1,040	Available in the FY 2004 PAR		

Performance Goal 4: Improve the Technological Capability, Productivity and Competitiveness of Small Manufacturers (NIST)

Measure	FY 2000 Actual	FY 2001 Actual[3]	FY 2002 Target	FY2002 Actual[3,4]	FY 2003 Target[5]	FY 2003 Actual	FY 2003 Met	FY 2003 Not Met
Number of clients served by Manufacturing Extension Partnership (MEP) centers receiving federal funding[7]	20,903	21,420	21,543	16,902	16,684	Available December 2004		
Increased sales attributed to Manufacturing Extension Partnership (MEP) assistance[7]	$698M	$636M	$726M	$891M	$522M	Available December 2004		
Capital investment attributed to Manufacturing Extension Partnership (MEP) assistance[7]	$873M	$680M	$910M	$876M	$559M	Available December 2004		
Cost savings attributed to Manufacturing Extension Partnership (MEP) assistance[7]	$482M	$442M	$497M	$645	$363M	Available December 2004		

Performance Goal 5: Assist U.S. Businesses and Other Organizations in Continuously Improving their Productivity, Efficiency, and Customer Satisfaction by Adopting Quality and Performance Improvement Practices (NIST)

Measure	FY 2000 Actual	FY 2001 Actual	FY 2002 Target	FY2002 Actual[6]	FY 2003 Target	FY 2003 Actual	FY 2003 Met	FY 2003 Not Met
Number of applications to the Malcolm Baldrige National Quality Award (MBNQA) and Baldrige-based state and local quality awards[7]	911	646	954	444	1,110	Available in the FY 2004 PAR		
Number of Baldrige Criteria for Performance Excellence mailed by Baldrige National Quality Program (BNQP) and by Baldrige-based state and local quality programs[7]	176,248	164,949	191,700	124,757	177,870	Available in the FY 2004 PAR		

Performance Goal 6: Enhance Public Access to Worldwide Scientific and Technical Information through Improved Acquisition and Dissemination Activities (NTIS)

Measure	FY 2000 Actual	FY 2001 Actual	FY 2002 Actual	FY 2003 Target	FY 2003 Actual	FY 2003 Met	FY 2003 Not Met
Number of new items available (annual)	New	505,068	514,129	520,000	530,910	X	
Number of information products disseminated (annual)	New	14,524,307	16,074,862	17,000,000	29,134,050	X	
Customer satisfaction	New	97%	98%	98%	97%		X

[1] *FY 2000 actuals have been adjusted slightly from the previously reported figures due to improved database systems and data verification procedures that have been implemented in recent months.*

[2] *All ATP measures have been updated to include FY 2002 actuals. Due to data collection requirements, FY 2003 actuals will not be available until May 2004.*

[3] *FY 2001 and FY 2002 data for this measure have been adjusted from previously reported figures. Actual counts published in the FY 2004 Annual Performance Plan (APP) were the result of an error in reporting correct data provided by MEP. (Projected data were not replaced with actual data). The revised figures (shown above) accurately represent the number of clients served in FYs 2001 and 2002.*

[4] *Due to data collection requirements (lag is one year), FY 2002 actuals presented here represent a combination of reported and estimated client impacts; final FY 2002 data will be available the end of December 2003. FY 2003 actuals will be available the end of December 2004.*

[5] *The FY 2003 Presidential budget request called for funding only two MEP centers. Assuming enactment of the budget, MEP planned to discontinue these measures in FY 2003. The targets (shown here) for FY 2003 are based on the actual FY 2003 appropriation received.*

[6] *FY 2002 data based on applications to and Criteria disseminated by BNQP and 33 out of 54 state and local programs. FY 2003 data is not yet available from state and local programs; data will be available in April 2004.*

[7] *FY 2003 actual data for these measures was not available at the time of publication. When Commerce published the FY 2002 PAR, FY 2002 data were also not available. Therefore, FY 2002 actual data are included here for the first time.*

Resource Requirements Summary

(Dollars in Millions. Funding amounts reflect total obligations.)

Information Technology (IT)

Full-Time Equivalent (FTE)

Performance Goal 1: Promote Technology-based Growth Through Partnerships with Industry (OTP)				
	FY 2000 Actual	FY 2001 Actual	FY 2002 Actual	FY 2003 Actual
Office of the Under Secretary/ Office of Technology Policy (US/OTP)	7.1	7.8	7.9	9.5
Reimbursable	0.1	0.4	0.2	0.3
Total Funding	7.2	8.2	8.1	9.8
IT Funding[1]	0.4	0.3	0.3	N/A
FTE	39	40	46	42

Performance Goal 2: Provide Technical Leadership for the Nation's Measurement and Standards Infrastructure and Ensure the Availability of Essential Reference Data and Measurement Capabilities (NIST)				
	FY 2000 Actual	FY 2001 Actual	FY 2002 Actual	FY 2003 Actual
Scientific and Technical Research & Services				
Electronics and Electrical Engineering	38.6	40.6	41.5	44.4
Manufacturing Engineering	19.0	18.9	19.4	20.6
Chemical Science and Technology (S&T)	33.2	34.3	34.3	38.5
Physics	29.8	32.8	34.5	35.9
Material Sciences and Engineering	51.9	54.0	56.0	60.1
Building and Fire Research	15.2	17.6	20.2	22.4
Computer Science and Applied Math	46.5	55.6	56.4	52.9
Technology Assistance	17.8	17.8	18.1	18.6
Research Support Activities	26.2	29.0	44.5	59.7
Construction	200.5	37.7	70.6	77.1
Working Capital Fund				
Direct Investments	23.1	28.5	21.3	21.1
Reimbursable	110.7	115.5	150.6	144.8
Total Funding	612.5	482.3	567.4	596.1
IT Funding[1]	50.2	54.2	66.7	N/A
FTE	2,670	2,594	2,719	2,639

Performance Goal 3: Accelerate Technological Innovation and Development of the New Technologies that will Underpin Future Economic Growth (NIST)				
	FY 2000 Actual	FY 2001 Actual	FY 2002 Actual	FY 2003 Actual
Industrial Technology Services				
Advanced Technology Program (ATP)	198.3	175.4	197.8	199.4
Working Capital Fund	0.5	0.4	0.3	0.3
Total Funding	198.8	175.8	198.1	199.7
IT Funding[1]	5.8	4.0	4.0	N/A
FTE	270	239	254	247

Performance Goal 4: Improve the Technological Capability, Productivity, and Competitiveness of Small Manufacturers (NIST)				
	FY 2000 Actual	FY 2001 Actual	FY 2002 Actual	FY 2003 Actual
Industrial Technology Services				
Manufacturing Extension Partnership (MEP)	103.3	105.9	108.2	111.1
Working Capital Fund	1.1	0.5	0.3	0.2
Total Funding	104.4	106.4	108.5	111.3
IT Funding[1]	2.9	1.5	1.7	N/A
FTE	91	87	90	89

Performance Goal 5: Assist U.S. Businesses and Other Organizations in Continuously Improving their Productivity, Efficiency, and Customer Satisfaction by Adopting Quality and Performance Improvement Practices (NIST)				
	FY 2000 Actual	FY 2001 Actual	FY 2002 Actual	FY 2003 Actual
Scientific and Technical Research and Services				
National Quality Program	5.3	5.4	4.9	5.7
Working Capital Fund	3.5	1.1	0.1	2.5
Total Funding	8.8	6.5	5.0	8.2
IT Funding[1]	0.7	0.7	0.1	N/A
FTE	51	49	50	44

Performance Goal 6: Enhance Public Access to Worldwide Scientific and Technical Information through Improved Acquisition and Dissemination Activities (NTIS)				
	FY 2000 Actual	FY 2001 Actual	FY 2002 Actual	FY 2003 Actual
Reimbursable	38.3	34.7	27.7	27.7
Direct	0.0	0.0	0.0	0.0
Total Funding	38.3	34.7	27.7	27.7
IT Funding[1]	9.9	9.8	10.7	5.7
FTE	230	196	186	181

Discontinued Performance Goal: Protect the National Information Infrastructure				
	FY 2000 Actual	FY 2001 Actual	FY 2002 Actual	FY 2003 Actual
Scientific and Technical Research and Services				
Critical Infrastructure Protection Grant Program	N/A	5.0	0.0	0.0
Total Funding	N/A	5.0	0.0	0.0
IT Funding[1]	N/A	0.0	0.0	0.0
FTE	N/A	2	0	0

Grand Total	FY 2000 Actual	FY 2001 Actual	FY 2002 Actual	FY 2003 Actual
Office of the Under Secretary/ Office of Technology Policy (US/OTP)	7.2	8.2	8.1	9.8
NIST				
Scientific and Technical Research and Services	283.5	311.0	329.8	358.8
Industrial Technology Services	301.6	281.3	306.0	310.5
Construction	200.5	37.7	70.6	77.1
Working Capital Fund	138.9	146.0	172.6	168.9
NTIS	38.3	34.7	27.7	27.7
Total Funding	970.0	818.9	914.8	952.8
Direct	792.7	637.8	736.3	755.9
Reimbursable[2]	177.3	181.1	178.5	196.9
IT Funding[1]	69.9	70.5	83.5	5.7
FTE	3,351	3,207	3,345	3,238

1 IT funding is included in total funding; total funding includes direct and reimbursable obligations.

2 Reimbursable funding includes NIST working capital fund investments.

Skill Summary:

At the end of FY 2003, the staffs of the three component bureaus of TA reflected the following levels of educational attainment:

- Total OTP staff included 8% Ph.D., 18% M.A. or M.S., and 42% B.A. or B.S. holders.
- Total NIST staff included 29% Ph.D., 14% M.A. or M.S., and 19% B.A. or B.S. holders. The breakdown of professional staff by major NIST organization was:
  - NIST laboratories: 59% Ph.D., 18% M.A. or M.S., 16% B.A. or B.S. holders
  - ATP: 47% Ph.D., 33% M.A. or M.S., 17% B.A. or B.S. holders
  - Manufacturing Extension Partnership (MEP): 5% Ph.D., 60% M.A. or M.S., 30% B.A. or B.S. holders
  - BNQP: 25% Ph.D., 38% M.A. or M.S., 25% B.A. or B.S. holders
- Total NTIS staff included 7% M.A. or M.S. and 20% B.A. or B.S. holders.

IT Requirements:

The IT systems NIST operates will continue to shape the ability of its employees to effectively and efficiently accomplish their work and achieve NIST's mission. It is essential that NIST be able to provide an integrated, effective suite of IT resources and services that support current NIST personnel and organizational needs, anticipate the future needs of the organization, and enable NIST to appropriately disseminate information to the public. The efficiency and quality of NIST activities, including technology transfer services and many administrative functions, depend upon seamless, powerful, and highly accessible IT resources. Intramural research programs comprise the bulk of NIST's high-performance, laboratory computing needs and drive its IT strategies. To achieve its IT objectives, NIST must:

- Upgrade computing and communications systems on a regular basis, and focus on high-end computational resources, networking, and electronic information dissemination capabilities; data storage capacity; and security conditions;
- Promote interoperability within and across hardware and software platforms;
- Provide enhanced management information systems, particularly e-commerce applications for internal systems;
- Develop central support for local workstations, and improve user efficiency and system security;
- Develop more coordinated and integrated public information dissemination technologies, and keep in mind the Administration's commitment to making government information more easily accessible and useful to the public; and
- Deploy computer systems security to protect business and scientific information.

FY 2003 Performance Goals

Performance Goal 1: Promote Technology-based Growth Through Partnerships with Industry (OTP)

Corresponding Strategic Goal

Strategic Goal 2: Provide infrastructure for innovation to enhance American competitiveness.

Rationale for Performance Goal

OTP serves as a key focal point within the Federal Government for leadership on civilian technology policy. It supports technology-based growth through a range of programs and policy development activities, addressing both domestic and international matters, that work as a whole to identify key policy needs and options, strengthen the capacities for technological innovation by the nation's industry and S&T community, and hasten the transfer of new scientific and technological advances to the private sector for commercial development. Through its analytical reports and memoranda, briefings and congressional testimony, OTP provides national, state and local policymakers with information and deeper understanding of trends and policy implications of new technologies, business models and practices, and the implications for U.S. competitiveness of technology policy issues. In addition, OTP analyses are widely used by the private sector and the general public.

OTP plays an important role in developing and coordinating national technology policy, working in partnership with industry and the S&T community and serving as an advocate for policies that leverage the benefits of new technology and enhance the strength of the nation's economy.

In working to achieve the performance goal, OTP's efforts are focused on general goals (measures) and objectives that will support and improve the U.S. innovation system; advance the role technology plays in U.S. economic growth and homeland security; strengthen the competitive position of U.S. technology industries; and strengthen the organization, capabilities, and resources of OTP to maximize the effectiveness of its activities and services.

FY 2003 Performance

OTP achieved its goal, activities, and performance targets for FY 2003. OTP significantly improved its focus, management, and performance. Specifically:

Measure 1a: Support and Improve the American Innovation System

Strategies	FY 2003 Activities and Performance Targets	Completed
Facilitate inter-agency coordination of regulatory and legislative policy initiatives.	• Develop and publish legislatively mandated annual report to Congress and the President on U.S. Government technology transfer activities and trends.	Yes
Prepare and deliver reports on technology transfer practices and issues in response to Administration requests, congressional mandates, and emerging policy issues.	• Convene interagency and stakeholder groups to develop recommendations for clarification or change to specific policies and practices under the Bayh-Dole Act.	Yes
	• Assist with development of Web-based tools to facilitate consideration of national security factors in technology transfer at national laboratories.	Yes
Prepare and deliver reports on innovation and technology issues in response to Administration requests, Congressional mandates, and policy issues.	• Develop and promote science and technology (S&T) career-related Web content for GetTech Web site.	Yes
	• Convene roundtable to identify likely impacts of the next-generation of educational and training technologies, and barriers to their development and adoption.	Yes
Regularly meet with industry leaders to identify excellence and best practices. Develop, publish, and disseminate the results as educational resources for policymakers and stakeholders.	• Manage the President's National Medal of Technology program to promote the value of technology innovation by providing public recognition to successful inventors.	Yes

Measure 1b: Advance the Role Technology Plays in U.S. Economic Growth and Homeland Security

Strategies	FY 2003 Activities and Performance Targets	Completed
Prepare and deliver reports on emerging and advanced technology policy (ATP) issues in response to Administration requests, congressional mandates, and policy issues.	• Organize series of panel discussions to identify status, opportunities, and barriers to development and adoption of emerging technologies.	Yes
	• Prepare and disseminate summaries/analyses of quarterly panel discussions on emerging technologies, including recommendations for policymakers actions.	Yes
Provide Administration and congressional policymakers with policy options concerning emerging and advanced technologies.	• In roundtables, conferences, and other public fora, promote understanding and use of productivity-enhancing information technologies (such as broadband Internet) in business, education, medicine, and research.	Yes
Serve as industry advocate within the White House, U.S. Government, and international policy for a to work for adoption of policies to strengthen U.S. innovation in emerging and advanced technologies.	• Participate in Office of Homeland Security initiatives (such as cyber security) as liaison to information communication technologies industries.	Yes
	• Develop and publish report on status of telemedicine technologies.	Yes[1]
	• Develop and publish first U.S. Government survey of national biotechnology industries.	Yes[1]
Organize press briefings and roundtable discussions to inform Congress, U.S. Government agencies, industries, science and technology (S&T) community, and public about Office of Technology Policy (OTP) analytical findings. Disseminate information on the Web.	• Develop, publish, and disseminate reports for use by state and local policymakers and the public, such as the 4th State S&T Indicators report.	Yes
Prepare and deliver reports on strategies that facilitate technology-led economic growth.	• Work with local communities, national experts, and other U.S. Government agencies to develop and deliver educational and training modules focused on developing capital and technology infrastructures for technology-led economic growth at the state and local levels.	Yes
Develop outreach events to provide information and promote infrastructure contributing to technology-led economic growth.		

[1] *Both reports were developed and drafted – awaiting interagency final approval – publication slated for Fall 2003.*

Measure 1c: Strengthen the Competitive Position of U.S. Technology Industries		
Strategies	**FY 2003 Activities and Performance Targets**	**Completed**
Prepare and deliver reports on innovation and technology issues in response to Administration requests, congressional mandates, and emerging needs. Provide Administration and congressional policymakers with policy options concerning U.S. innovation issues. Liaison with technology industries to learn views on policy priorities. Serve as industry advocate within White House, U.S. Government, and international policy for a to work for adoption of policies to strengthen U.S. innovation. Represent the U.S. Government in bilateral and multilateral meetings.	• Interact with industry to identify views and priorities on domestic and international policies and priority recommendations.	Yes
	• Attend industry meetings and organize outreach events to learn views on policies including tax, regulatory, litigation, e-commerce, standards, and others.	Yes
	• Use TA's position as APEC's Industrial S&T Working Group Webmaster to improve utilization of information technology for information dissemination and activities related to international policy and project management.	Yes
	• Advise the Secretary of Commerce on technology issues based on ongoing analysis and consultations with industry and the science and technology (S&T) community.	Yes
	• As lead of the U.S. delegation to the semi-annual meetings of the APEC Industrial S&T Working Group, work with other federal agencies to encourage APEC collaboration on critical technology issues.	Yes
	• As U.S. Government representative to the semi-annual meetings of the Organization for Economic Cooperation and Development (OECD) Technology and Innovation Policy Working Group, incorporate U.S. interests into OECD approaches to intellectual property rights protection, business investments in research and development (R&D), tehcnology transfer, and workforce mobility.	Yes
	• As lead of the U.S.-Israel Science and Technology Commission, develop and implement bilateral projects (for example, workshops and training) that advanced U.S. technology and commercial interests through cooperation with Israel in biotechnology and information technology.	Yes

Measure 1d: Strengthen the Office of the Under Secretary/Office of Technology Policy's (US/OTP) Organization, Capabilities, and Resources to Maximize the Effectiveness of its Activities and Services		
Strategies	**FY 2003 Activities and Performance Targets**	**Completed**
Transform Office of the Under Secretary/Office of Technology Policy's (US/OTP) international organization and procedures to align with President's Management Agenda (PMA) objectives.	• Implement workforce restructuring plan to streamline middle management.	Yes

Program Evaluation

During FY 2003, OTP held regular quarterly reviews of its policy efforts.

Performance Goal 2: Provide Technical Leadership for the Nation's Measurement and Standards Infrastructure and Ensure the Availability of Essential Reference Data and Measurement Capabilities (NIST)

Corresponding Strategic Goal

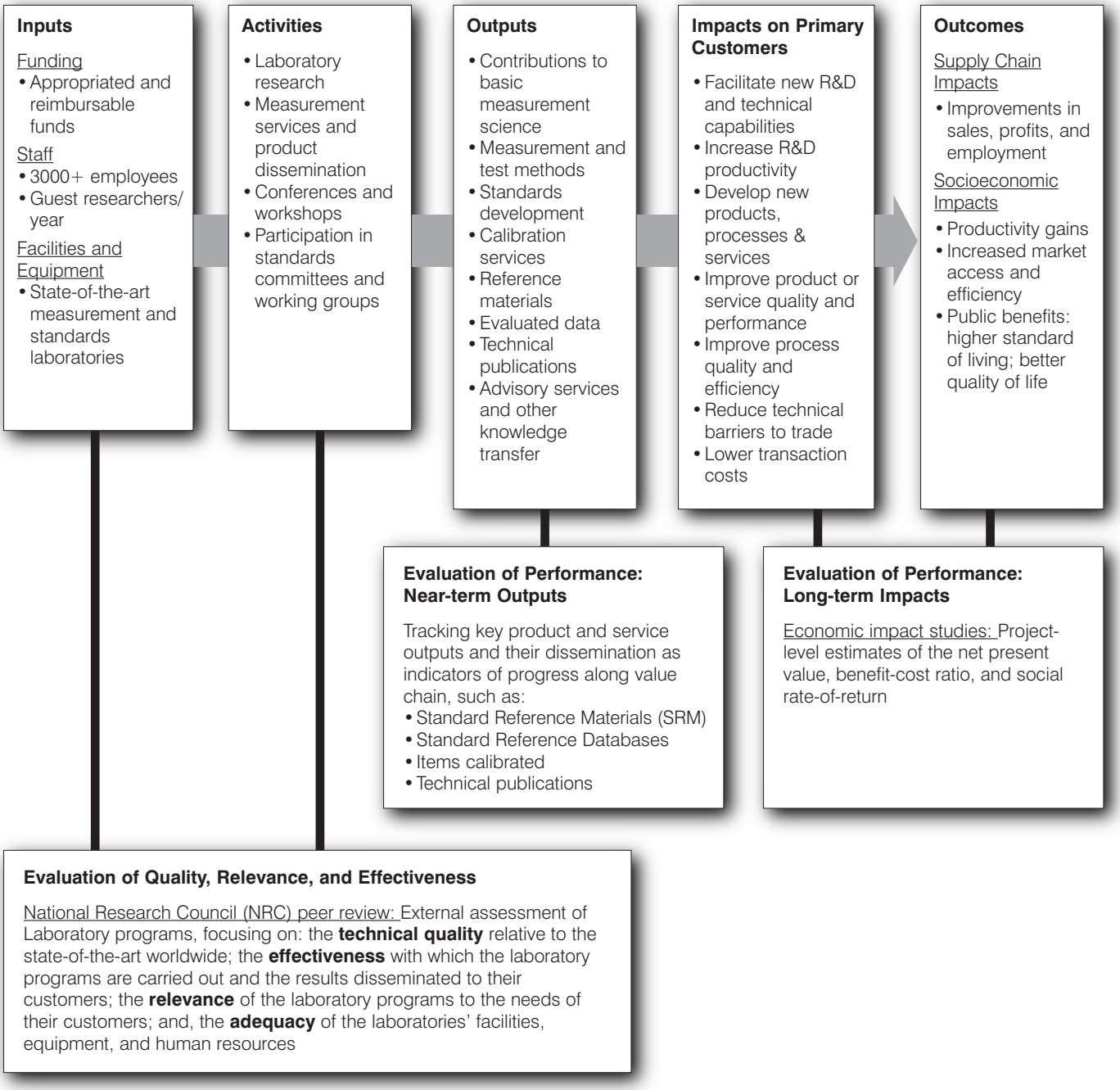
Strategic Goal 2: Provide infrastructure for innovation to enhance American competitiveness.

Rationale for Performance Goal

The NIST Laboratory Programs develop and deliver measurement techniques, reference data, test methods, standards, and other infrastructural technologies and services that provide a foundation for industry in all stages of commerce: research, development, testing, production, and marketing. The NIST Laboratory Programs also support U.S. firms in the global marketplace by working to eliminate trade barriers associated with different national standards, testing, and certification requirements. Since its establishment in 1901 as the NBS, NIST has collaborated closely with industry to anticipate and address the nation's measurement, standards, and technology needs.

The NIST Laboratory Programs perform research to develop the measurement tools, data, and models for advanced S&T. The model below depicts the NIST Laboratory Program's value-creation chain—from inputs like funding and staff to outcomes like productivity gains and improved quality of life. The model also includes the evaluation methods and measures used to track progress along the impact path, each of which is described in more detail in the sections that follow.

NIST Laboratory Program: Impact and Evaluation Logic Model



NIST has designed its performance evaluation system to accommodate the organization's specific mission and impact path as well as to respond to the intrinsic difficulty of measuring the results of investments in S&T. Like other federal science organizations, the primary output of the NIST Laboratory Programs is scientific and technical knowledge, which is inherently difficult to measure directly and comprehensively. In addition, the outcomes from research often do not begin to accrue until several years after the research program has been completed, and the diffusion of benefits often affects broad segments of industry and society over long time periods. Given these challenges, NIST evaluates its performance against each laboratory strategic goal using a mix, appropriate to each goal, of specific output tracking plus crosscutting peer review and economic impact analyses. Taken together, these evaluation tools, combined with continual feedback from customers, provide NIST management and external stakeholders with a detailed and broad view of NIST's performance toward its long-term goals.

Alignment with the PMA R&D Investment Criteria

A key component of the PMA involves the development of criteria for evaluating investments in federal R&D programs. As developed to date, the R&D investment criteria center on the evaluation of quality, relevance, and performance. As depicted in the impact and evaluation graphic above, NIST uses a combination of external peer review, output tracking, and retrospective economic impact studies to evaluate quality, relevance, and performance over time. NIST's peer review process is particularly productive, as it is comprehensive and ultimately focused on evaluating the quality, relevance, and effectiveness of NIST's efforts to serve its customers' current and prospective measurement and standards needs.

To evaluate prospective investment choices, NIST completed a long-term strategic plan (NIST 2010) that used a combination of external trend analysis and specific opportunity assessments to identify areas where NIST's measurement, standards, and advisory services are critical to technological advancements that have enormous potential impact on the nation's productivity, trade, and quality of life. Where feasible, NIST also contracts for focused prospective economic analyses that estimate the costs associated with inadequate technical infrastructure in specific markets. One recent study evaluated the current and future impact of the International Standard for the Exchange of Product Model Data (STEP). The study estimates that STEP, an international standard designed to address interoperability problems encountered in the exchange of digital information, has the potential to save $928 million per year in the automotive, aerospace, and shipbuilding industries. Prospective studies of this nature are used to help NIST refine its investment choices within specific arenas of potential work.

NIST augments these evaluation methods with continual feedback from customers as well as broad policy and management oversight by the Visiting Committee on Advanced Technology (VCAT). These mechanisms provide additional means for aligning NIST's work with customer needs and managing its programs in the most effective manner possible.

FY 2003 Performance

In 2003 the NIST Laboratory Programs continued a tradition of high quality and strong performance. The laboratories received a thorough external and independent evaluation by the National Research Council (NRC) Board on Assessment of NIST Programs, which has evaluated NIST on an annual basis since 1959. In 2003, the Board on Assessment report pointed to the consistently high technical quality of the laboratories, the relevance of the laboratories' work to current customer needs, and the strong performance of the laboratories overall. The NRC review, which is summarized below and available online at http://books.nap.edu/catalog/10820.html, also highlighted the need for continued improvements in NIST facilities and equipment, balancing human resource needs, and systematic planning and priority setting in light of flat budgets.

In any given year, the transfer of NIST's laboratory research capability and measurement knowledge is indicated generally by its suite of output metrics: Standard Reference Materials (SRM), data, calibration services, and technical publications.

Measure 2a: Qualitative Assessment and Performance Evaluation Using Peer Review

Since 1959, the NRC has reviewed the NIST Laboratory Programs annually. The annual NRC Board on Assessment of NIST Programs review is independent, technically sophisticated, and extensive. The board consists of approximately 150 scientists and engineers, organized into seven panels (one for each of the seven NIST Laboratories) plus two sub-panels for specialized programs. Panel reviews are reported at the division level (the major organizational unit for the laboratories) and build upon assessments of research processes at the project and program levels.

Each year, the lab-specific panels conduct a two- to three-day on-site review of each laboratory's technical quality, paying particular attention to the following factors, as charged by the NIST Director:

- The technical merit / quality 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 their customers;
- The relevance of the laboratory programs to the needs of their customers; and
- The ability of its facilities, equipment, and human resources to enable the laboratories to fulfill their mission and meet their customers' needs.

The NRC panel reports for each laboratory provide the basis for a comprehensive annual peer review report on the NIST Laboratory Programs. As in prior years, the NRC report for FY 2003 provides each laboratory, and NIST as a whole, not only with an external quality assessment, but also with valuable information that it can use for its own performance assessment, planning, and management functions. The table below provides summary statements for the laboratories, excerpted from NRC's 2003 report. All NRC reports are posted online at: http://books.nap.edu; the FY 2003 report is available at: http://books.nap.edu/catalog/10820.html.

Sample Statements from NRC Peer Review, FY 2003

Laboratory	
Electronics and Electrical Engineering (EEEL)	"The work in EEEL continues to be of very high technical merit and quality. Many staff members are recognized as world leaders in their fields. In general, there is significant linkage between EEEL projects and the goals of the laboratory supporting NIST's mission… EEEL divisions are doing an excellent job of providing services, interacting with their customers, performing scientific research, and circulating the results of their investigations…The extended period of excessively lean budgets for the support of current laboratory activities now clearly has an influence on its present and future capabilities and effectiveness… Succession planning factored with strategic planning is critical to the future health and survivability of the [EEEL] divisions." (pp. 17, 20, 22).
Manufacturing Engineering (MEL)	"The [MEL] has a unique role to play in U.S. manufacturing through its expertise in measurements and standards… The quality of research in the [MEL] is high overall… In some areas, MEL work is state of the art relative to work being performed worldwide… MEL is working effectively to broaden its customer base and is establishing processes to identify best initiatives to help customers... A formal process and format should be established for planning and reporting project time lines and displaying a clear roadmap of current and planned activities, with a focus on continual process improvement." (pp. 28, 30).
Chemical Science and Technology (CSTL)	"CSTL's research and standards programs are technically excellent overall… CSTL has clearly demonstrated both the relevance and effectiveness of its programs to its customers, primarily U.S. industry, government, and academia, but also to international science, technology, and commerce… [CSTL's] innovative practices and successful partnering have sustained exceptional productivity and the continuation of its high visibility, recognition, and world leadership in the development of measurement standards… CSTL has implemented an excellent strategic planning process that is closely aligned with the goals and objectives of the overall NIST strategic plan…" (pp. 37-38).
Physics (PL)	"The NIST Physics Laboratory has long been known among its technical peers for the outstanding level of its scientific research. The laboratory has a tradition of world leadership in many of its areas of activity… continues to serve as a central, impartial presence in metrology and calibrations for commercial and scientific development... The Physics Laboratory continues to reach out through a variety of efforts to ensure that its programs are responsive to customer and national needs and that reliable experimental and theoretical information is maintained to support emerging technological and scientific directions…The Physics Laboratory must continue to develop a strategic plan and prioritization process that results in clear laboratory goals… "(pp. 45-46, 48).
Materials Science and Engineering (MSEL)	"The technical quality of MSEL continues at a very high level, as evidence by its quality contributions and impact on emerging science and technologies… The panel determined that [MSEL] is enhancing its relevance and effectiveness through reliance on its strategic plan for the allocation of limited resources to a growing set of national needs…The panel commends the laboratory for maintaining a balance between these new focus areas and continued service to its historical constituency groups… The panel noted in particular that the laboratory is making better use of collaborations both within and outside of NIST… Continued attention is needed… [on] the potential for subcritical staffing of important programs and the maintenance of key areas of investigation to secure the laboratory's role in the strategic mission of NIST. "(pp. 56-57, 60).
Building and Fire Research (BFRL)	"The panel continues to be impressed by the high quality of scientific and technical work produced in the [BFRL]… BFRL staff takes advantage of the special tools and expertise that exist in the laboratory to provide their customers with unbiased, technically excellent work focused on the measurement and testing needed to improve the quality of materials and technologies… The National Construction Safety Team Act presents a tremendous opportunity for BFRL. The laboratory still has to define a strategy for deploying resources to an investigation and, once completed, for disseminating the results… The laboratory has taken early steps toward the development of a strategic plan and of performance metrics. Next steps should include the specification of time lines, milestones, and interdependencies." (p. 64)
Information Technology (ITL)	"The overall technical quality and the merit, relevance, and effectiveness of the Information Technology Laboratory's programs and staff remain strong… There is ample evidence of outstanding work in leveraging technology ideas across customer areas for industry, academia, government, and within NIST…. ITL has worked hard and effectively to develop metrics for its performance. ITL should work with customers… to further develop means of assessing the effectiveness of ITL projects and products. ITL's interactions with and impact on industrial customers continue to be strong, and the panel applauds the laboratory's ability to produce and disseminate results of value to a broad audience." (pp. 74, 77)

Measure 2b: Economic Impact Studies

NIST uses retrospective microeconomic studies to assess the long-term impacts that derive from specific NIST Laboratories' programs or projects. NIST has been conducting economic impact studies on a regular basis since 1992, and initiates two to four new impact studies annually. External economic and technical experts contracted by NIST conduct impact assessments of NIST's R&D in specific technical areas. These studies provide both quantitative estimates and qualitative assessments of the economic impacts resulting from the different types of technology infrastructure that NIST provides to U.S. industry. Quantitative estimates compare project costs with quantitative impact evidence in such areas as productivity, quality, time-to-market, transaction costs, sales, market share, and profits.

NIST impact studies use the same quantitative metrics as industry, typically providing one or more of three metrics: (1) net present value and two efficiency measures; (2) a benefit-cost ratio, which compares the net present value of benefits and costs over the time period being analyzed; and (3) a social (internal) rate of return, which represents the annual percentage rate that would be required to reduce the net present value of the benefit time series to zero (i.e., to yield a benefit-cost ratio of one—the break-even point for a project). Recent impact studies also provide qualitative descriptions of impacts that are significant but difficult to quantify, such as the impact of NIST infratechnologies on R&D strategies and capabilities, organizational efficiency, market access, and effectiveness in working with external actors such as suppliers and standards organizations. Studies conducted over the last five years indicate that NIST outputs generate rates of return on R&D that consistently exceed the estimated average returns on R&D conducted by private industry (see table below).[1]

Collectively, these studies validate NIST's fundamental impact logic model: they prove, in other words, that the measurement and standards infrastructure provided by NIST generate impacts on R&D productivity, market efficiency, product quality, and other factors—typically at a level that far exceeds the input costs.

Individually, these studies also provide management with a broader range of useful qualitative information on such important factors as the nature of the R&D life cycle in individual industries; the points at which measurement technologies affect R&D, production, and market transactions at different levels of the supply chain; and the modes of potential impact associated with different types of NIST infratechnologies.

During the reporting year, NIST focused its limited economic reporting resources on prospective studies to compliment NIST ongoing strategic planning efforts.

[1] *Nadiri (National Bureau of Economic Research, 1993) estimates an average 20 to 30 percent private return and an average 50 percent social return on R&D conducted by private industry.*

Economic Impact Studies: Long-term Outcomes of NIST Laboratory Research

Industry: Project	Year	Output	Outcomes	Measures[1]
Chemicals: gas-mixture reference standards	2002	NIST-traceable reference materials	Lower regulatory compliance costs; improve market efficiency	SRR: 221-228%; BCR: 21-27; NPV: $49M to $63M
Communications: security (role-based access control)	2002	Generic technology reference models and security standards	Enable new markets; increase research and development (R&D) efficiency	SRR: 62%; BCR: 109; NPV: $292M
Electronics: Josephson voltage standard	2001	Standard Reference Materials (SRM)	Increase R&D efficiency; increase productivity; enable new markets	SRR: 877%; BCR: 5; NPV: $18M
Communications: security (data encryption standards)	2001	Standard conformance test methods/services	Increase R&D efficiency enable new markets	SRR: 267-272%; BCR: 58-145; NPV: $345M-$1.2B
Pharmaceuticals: cholesterol measurement	2000	SRMs	Increase productivity decrease transaction costs	SRR: 154%; BCR: 4.5; NPV: $3.5M
Photonics: laser and fiberoptic power and energy calibration	2000	Calibrations	Increase productivity decrease transaction costs	SRR: 43%-136%; BCR: 3-11; NPV: $48M
Chemicals: SRMs for sulfur in fossil fuels	2000	SRMs	Increase productivity reduce transaction costs	SRR: 1,056%; BCR: 113; NPV: $409M
Semiconductors: software for design automation insulated-gate bipolar transistor semiconductors)	1999	Software model	Increase R&D efficiency increase productivity	SRR: 76%; BCR: 23; NPV: $10M
Chemicals: alternative refrigerants	1998	Standard Reference Data (SRD)	Increase R&D efficiency increase productivity	SRR: 433%; BCR: 4
Materials: phase equilibria for advanced ceramics	1998	SRD	Increase R&D efficiency increase productivity	SRR: 33%; BCR: 10
Materials: thermocouples	1997	SRD (calibration)	Lower transaction costs increase product quality	SRR: 32%; BCR: 3
Pharmaceuticals: radiopharmaceuticals	1997	SRMs	Increase product quality	SRR: 138%; BCR: 97
Photonics: optical detector calibration	1997	Standards and calibration services	Increase productivity	SRR: 72%; BCR: 3

[1] *The benefit-cost ratio (BCR) compares the net present value of benefits and costs over the time period being analyzed. Social (internal) rate of return (SRR) represents the annual percentage rate that would be required to reduce the net present value (NPV) of the benefit time series to zero (i.e., to yield a benefit-cost ratio of one—the break-even point for a project).*

Measure 2c: Standard Reference Materials (SRM) Available

	FY 2000	FY 2001	FY 2002	FY 2003
Target	1,300	1,315	1,350	1,360
Actual	1,292	1,335	1,353	1,214
Met/Not Met	Not Met	Met	Met	Not Met

Explanation of Measure

The number of SRMs available illustrates the breadth of measurements supported by NIST. SRMs are certified for their specific chemical and material properties in the NIST Laboratories. SRMs are the definitive source of measurement traceability in the United States—all measurements using SRMs can be traced to a common and recognized set of basic standards that provides the basis for compatibility of measurements among different laboratories. In addition, as economic exchange has become more global, customers are using SRMs to achieve measurement quality and conformance to process requirements that address both national and international needs for commerce and trade. The data represent a direct count of SRMs available to customers at the close of the fiscal year and are tracked on an ongoing basis by NIST Technology Services. Data provide information on output levels only.

Based on feedback from OMB's PART review of the NIST Laboratory Programs, NIST is developing new performance metrics that provide better indicators of the demand for and use of NIST measurement and standards outputs. Baseline numbers for the new measures will be reported in the FY 2004 PAR.

FY 2003 Performance

The number of SRMs available in FY 2003 represents 89 percent of the expected level. NIST continues to focus on those SRMs that cannot be produced by secondary laboratories and which have broad and/or high downstream impact. With this focus, the number of SRMs available in any given year may vary as NIST evaluates the development of new SRMs and the discontinuation of others. In addition, in FY 2003 NIST implemented a new data collection system that more accurately captures the number of SRMs available. Prior to FY 2003, the tabulations did not sufficiently distinguish unique SRMs. For example, a single SRM, along with a recent update, may have been counted as two separate reference materials.

Measure 2d: Standard Reference Data (SRD) Titles Available				
	FY 2000	FY 2001	FY 2002	FY 2003
Target	63	66	68	70
Actual	63	65	90	106
Met/Not Met	Met	Not Met	Met	Met

Explanation of Measure

This measure describes the number of Standard Reference Data (SRD) titles that the NIST Laboratories produce and make available through the NIST SRD Program. Standard Reference Databases provide numeric data to scientists and engineers for use in technical problem solving, research, and development. These recommended values are based on data that have been extracted from scientific and technical literature, assessed for reliability, and then evaluated to select the preferred values. The data represent a direct count of available SRD titles and are updated on an ongoing basis by the NIST SRD Program. Data provide information on output levels only.

FY 2003 Performance

The significant difference between FY 2002 and FY 2003 targets and actual counts reflect a change in the method NIST uses for tabulating the databases that it makes available to the public; the significant increase largely reflects the change to a more accurate reporting of the SRD titles available. Prior to FY 2002, the tabulations did not sufficiently represent the number of discrete databases that were made available through the Web; in some cases, several distinct databases had been counted as a single database because they are clustered at a single overarching Web address. Historically, NIST produces several new SRD titles per year and provides numerous upgrades to existing databases. Each year some database titles are eliminated from the NIST catalog. NIST is focused on providing a larger percentage of these titles via the Internet.

Measure 2e: Number of Items Calibrated				
	FY 2000	FY 2001	FY 2002	FY 2003
Target	3,200	3,100	2,900	2,900
Actual	2,969	3,192	2,924	3,194
Met/Not Met	Not Met	Met	Met	Met

Explanation of Measure

This measure illustrates the quantity of physical measurement services provided by NIST for its customers, including calibration services, special tests, and Measurement Assurance Programs (MAP). NIST offers more than 500 different types of physical calibrations in areas as diverse as radiance temperature, surface finish characterization, and impedance. NIST calibration services and special tests are characterizations of particular instruments, devices, and sets of standards with respect to international and national standards. NIST calibration services provide the customer with direct traceability to national and international primary standards. MAPs are quality control programs for calibrating entire measurement systems. The output data represent a direct count of the number of items external customers sent to NIST for formal calibration services (prior year output data may include a very small percentage of NIST internal items). The data provide information on service output levels only and represent a measure of throughput but not workload per se, as the number of tests and/or the time and calibration effort required can vary substantially across items. As with SRMs and SRD titles, downstream impact is a function of the nature of individual calibration services more than the sheer volume of items calibrated.

FY 2003 Performance

Over time NIST anticipates a relatively high but slightly declining number of items calibrated for two reasons: (1) extended calibration cycles as well as changing technology and industry mergers continue to reduce the number of artifacts delivered to NIST for calibration; (2) NIST focuses on conducting calibrations that require a direct connection to the national standards, and on improving calibration accuracy in areas where new industry demands are emerging. While the long-term trend, over the past several decades, show a decline in the number of items calibrated by NIST, individual years may fluctuate, as with the increase in FY 2001 and FY 2003 due largely to the to periodicity of multi-year calibration cycles.

Measure 2f: Technical Publications Produced				
	FY 2000	FY 2001	FY 2002	FY 2003
Target	2,450	2,200	2,050	2,100
Actual	2,250	2,207	2,236	1,918
Met/Not Met	Not Met	Met	Met	Not Met

Explanation of Measure

Citation Rates Show High Demand for NIST Technical Publications

Print publications are a major channel through which NIST diffuses the scientific and technical knowledge generated by its staff. For GPRA purposes, NIST reports the number of publications generated by its staff as a partial indicator of the Institute's research output. Of these technical publications produced annually, approximately 80 percent are published externally (such as in scientific journals), while the remaining 20 percent are NIST reports and special publications.

In addition, within the scientific community, citation rates often are used to gather additional information about the demand for or relevance of published research: the cumulative number of citations per publication provides a rough gauge of the level of use and hence "impact" of the publications. NIST has assessed the citation rates for its publications by using data collected by the Institute for Scientific Information (ISI), which has been collecting research publication data for more than forty years and now maintains the most comprehensive source of available publication data for scientific and technical organizations. According to these data, NIST's "relative impact"—that is, the average citation rate per NIST publication relative to ISI's baseline citation rate number for all scientific and technical organizations in its database—from 1981 through 1999 has been consistently above average. These data indicate that NIST consistently produces relevant scientific and technical publications that are cited frequently and hence used quite broadly.

This measure represents the annual number of technical publications generated by the NIST Laboratories staff. The number is a direct count of the number of technical publications approved by the NIST Editorial Review Boards at the Gaithersburg and Boulder sites. NIST uses publications as one of the mechanisms to transfer the results of its research to the U.S. private sector and to other government agencies that require cutting-edge measurements and standards. Roughly 60 percent of these publications appear in prestigious scientific journals and withstand peer review by the scientific community. Others appear in technological forums where measurement standards and technologies developed by NIST staff (at times in collaboration with private sector partners) are disseminated. See also text box. The NIST Office of Information Services updates data on an ongoing basis. Data are not adjusted for quality and do not capture impact.

FY 2003 Performance

Actual publications produced in FY 2003 represent 93 percent of the expected level. While NIST expects a relatively constant level of high-quality publications (approx. 2,000 per year) factors such as technical staff levels and the nature and specific research findings in any given year may contribute to slight fluctuations in the number of publications produced.

NIST is in the process of revising many of its annual output measures to focus more on the quality and demand for NIST research results and standards services. While NIST uses publications as one mechanism for disseminating the results of its research to the U.S. private sector, universities, and other government agencies, the current measure only captures output. The revised measures that NIST will begin reporting on in FY 2004 will focus on: (1) the number of peer-reviewed technical publications (which serves as a partial indicator of quality); and (2) the citation impact of NIST-authored publications (which provides a partial indicator of quality and utility).

Program Evaluation

For the FY 2005 budget cycle, the NIST Laboratory Programs were assessed using OMB's Program Assessment Rating Tool (PART). The results of this assessment will be published with the FY 2005 President's budget.

Performance Goal 3: Accelerate Technological Innovation and Development of the New Technologies that will Underpin Future Economic Growth (NIST)

Corresponding Strategic Goal

Strategic Goal 2: Provide infrastructure for innovation to enhance American competitiveness.

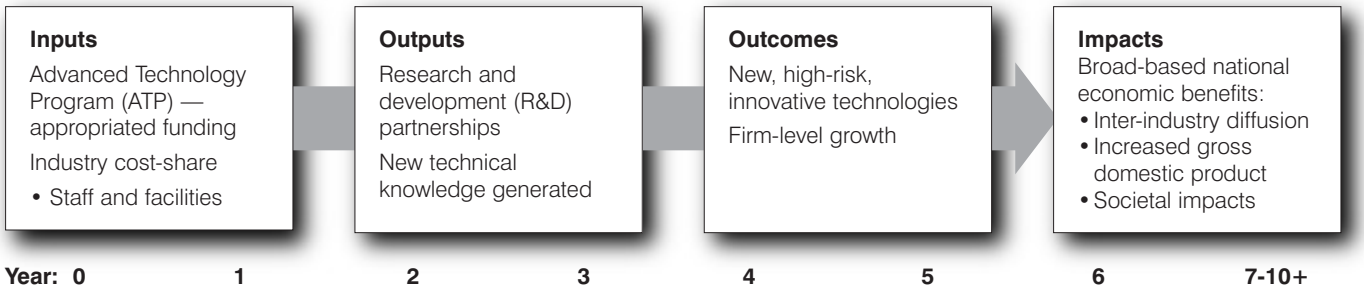
Rationale for Performance Goal

R&D funding in the United States has changed profoundly over the last 40 years. Once the primary source of funding, the Federal Government now only provides about 26 percent of all R&D funds in the United States, while funds from private industry have expanded from 33 percent in 1960 to 68 percent in 2000. The nation's economic success and future prospects depend in large measure on the R&D strategies of private firms.

While the private sector has emerged as the nation's R&D powerhouse, market pressures often deter firms from investing in particular types of technology. Private industry never has accounted for a large percentage of the nation's basic R&D, because firms must be able to appropriate returns within a timeframe and at a level satisfactory to investors. For the same reasons, industry tends to avoid investing in certain types of enabling technologies: infrastructural technologies, which require distinct competencies and are broadly applied; multi-use technologies, which benefit multiple segments of an industry or group of industries; and high-potential breakthrough technologies, which typically involve risk levels and timeframes that far exceed the horizons of individual firms. These areas are the focus of the Advanced Technology Program (ATP): ATP works with industry and academia to identify and promote investment in technologies with significant potential for broad-based economic benefits but inadequate levels of private investment.

ATP plays a unique role in the nation's R&D infrastructure: it encourages industry to identify and invest resources in high-risk, broad impact technologies—technologies with significant economic and societal promise, but with inadequate levels of private investment.

The program is designed to generate broad-based economic benefits by stimulating industry-led partnerships to develop new technologies. ATP uses joint ventures and informal teaming arrangements to combine private investment and the best available scientific and technological talent in industry, universities, and government. The "impact path" for the ATP—from inputs like appropriated funds and industry matching funds to long-term economic benefits—is illustrated below.



From the start of the program, evaluation has been a central part of ATP operations, as a management tool to provide feedback to project selection and program operations, and to demonstrate program results to stakeholders and the public.

The ATP has developed a multi-component evaluation strategy to provide measures of progress and performance at various stages of its impact path: (1) for the short-term, from the time of project selection and over the course of the ATP-funding period (inputs and initial outputs); (2) for the mid-term, as commercial applications are pursued, early products reach the market, and dissemination of knowledge created in the R&D projects occurs (outcomes); (3) and for the longer-term, as more fully-developed technologies diffuse across multiple products and industries, with related net impacts on formation of new industries, job creation, and U.S. economic growth (impacts).

In the early and mid-stages of project evolution, ATP tracks key outputs from projects through its Business Reporting System (BRS), a unique internal database, which draws data from regular, systematic electronic project surveys and supplementary telephone surveys. Patents and technical publications generated by ATP-funded projects are key indicators used to represent the generation and diffusion of new commercially relevant technical knowledge. Taken together, these two indicators illustrate the generation and diffusion of technical knowledge created by ATP-funded R&D partnerships.

In addition to tracking patents and technical publications, ATP's BRS also tracks mid-course outcomes of ATP-funded projects, including the number of technologies under commercialization, to demonstrate the extent to which ATP projects have leverage or catalyzed new products and services. ATP also measures the long-term economic impact of ATP-funded projects through economic impact studies of well-established projects.

FY 2003 Performance

Due to ATP's data collection process, final FY 2003 data for ATP's performance metrics will be reported in the FY 2004 PAR. The FY 2002 data reported in this report show the ATP program met its targets for each of its three quantitative performance metrics. As explained below, these metrics are cumulative and represent performance realized through R&D projects funded over several fiscal years prior to the performance results.

Measure 3a: Economic Impact Studies

Fully successful ATP projects are expected to contribute significantly to the U.S. scientific and technical knowledge base, yield private benefits to the innovators, and ultimately yield benefits to others in the United States through market, knowledge, and/or network spillovers. The measurement of long-term economic outcomes requires well-established projects with technological outputs that have been in the market for long time periods. To measure long-term economic impacts derived from the set of funded ATP projects, the program conducts or contracts detailed and rigorous case studies. Where possible, these studies also estimate long-term project outcomes. For instance, a recent study of an ATP-funded joint R&D venture on digital mammography and radiography estimated a social rate of return of at least 69 percent and a benefit-to-cost ratio of at least 125:1 (Pelsoci, *Low-Cost Manufacturing Process Technology for Amorphous Silicon Detector: Applications in Digital Mammography and Radiography*, GCR 03-844, Feb. 2003).

Measure 3b: Cumulative Number of Technologies Under Commercialization				
	FY 2000	FY 2001	FY 2002	FY 2003
Target	170	180	190	210
Actual	166	195	244	Available in the FY 2004 PAR
Met/Not Met	Not Met	Met	Met	

Explanation of Measure

The data provide a cumulative direct count of the number of technologies commercialized, as determined through ATP's BRS. Commercialization is broadly defined as any group of activities undertaken to bring products, services, and processes into commercial applications, including development of commercial prototypes, adoption of processes for in-house production, development of spin-off products and processes, scale-up for volume production, and the sale and licensing of products and services derived from the technology base created by the ATP-funded project. This metric demonstrates, over time, the cumulative stock of new technologies commercialized as a result of an R&D program funded in part by ATP. In any given year, the number of technologies commercialized is a product of multi-year ATP funding.

FY 2003 Performance

For all ATP output metrics, final data for FY 2003 will be reported in the FY 2004 PAR. For FY 2002, the number of technologies commercialized exceeded the expected level due largely to a more systematic approach to collecting post-project impacts resulting from ATP-funded research. In 2001, ATP initiated the post-project survey (PPS), which resulted in the more systematic collection of data from completed projects. The PPS is conducted two, four, and six years following the close of the project, and awardees are asked to report on any new commercialization activities that occurred following the end of the project period. In FY 2001, 68 ATP participants in 54 completed projects participated in the PPS. In FY 2002, 223 participants in 115 projects participated in the PPS.

Moreover, the cumulative nature of this metric and ATP's multi-year funding cycle make year-to-year performance assessment less relevant than trend analysis over time.

Measure 3c: Cumulative Number of Publications				
	FY 2000	FY 2001	FY 2002	FY 2003
Target	680	720	770	860
Actual	565	747	969	Available in the FY 2004 PAR
Met/Not Met	Not Met	Met	Met	

Explanation of Measure

This cumulative count of publications generated by all ATP-funded research through the close of a given fiscal year represents a major channel for the diffusion of technical knowledge that results from ATP funding. Projections are based on extrapolations of past publication rates and projections of projects initiated and completed over time and are updated to reflect all currently available data. These targeting mechanisms are not perfectly accurate for several reasons. The publications data are impacted by delays in ATP project completion and/or project terminations, both of which are difficult to predict years in advance. In addition, publication rates vary significantly across technology areas. As a result, publications activity will be affected by changes in ATP's completed project portfolio. While these factors and others make perfectly accurate targeting difficult, ATP will continue to track its publications count closely, and also will analyze any trends that may indicate necessary adjustments to its projection models.

FY 2003 Performance

For all ATP output metrics, final data for FY 2003 will be reported in the FY 2004 PAR. For FY 2002, the number of publications generated by ATP-funded research far exceeded the expected level. ATP attributes the significant increase in publications in FY 2002 to more systematic collection of data from completed ATP projects that are now reporting post-project publications through ATP's PPS described on the previous page. Also discussed on the previous page, the cumulative nature of this metric and ATP's multi-year funding cycle make year-to-year performance assessment less relevant than trend analysis over time.

Measure 3d: Cumulative Number of Patents Filed

	FY 2000	FY 2001	FY 2002	FY 2003
Target	770	790	930	1,040
Actual	693	800	939	Available in the FY 2004 PAR
Met/Not Met	Not Met	Met	Met	

Explanation of Measure

The second of ATP's set of output measures, these data represent cumulative direct counts of the number of patents filed by all ATP-funded research project participants through the close of a given fiscal year. Projections are based on extrapolations of past patenting rates and projections of projects initiated and completed over time, and are updated to reflect all currently available data. These targeting mechanisms are not perfectly accurate for several reasons. First, the patenting process is difficult to predict, thus, for example, it is possible that patents projected to materialize in one fiscal year might not occur (or be reported) until the following year. Second, the patenting data are impacted by delays in ATP project completion and/or project terminations, both of which are difficult to predict years in advance. In addition, the proclivity to patent varies significantly across technology areas and markets, due in part to differences in the utility and role of intellectual property protection. For example, biotechnology-focused projects may generate more patents than projects of an equivalent size in the IT or manufacturing sectors. As a result, patent activity (like publications) will rise or fall as ATP's completed project portfolio shifts to a different mix of projects. While these factors and others make perfectly accurate targeting difficult, ATP will continue to track its patent count closely, and also will analyze any trends that may indicate necessary adjustments to its projection models.

FY 2003 Performance

For all ATP output metrics, final data for FY 2003 will be reported in the FY 2004 PAR. For FY 2002, the actual cumulative number of patents filed by ATP-funded research met the anticipated goal. As with other ATP metrics, the patent metric is designed to show the cumulative growth in the stock of commercially relevant knowledge generated through ATP funding over several fiscal years.

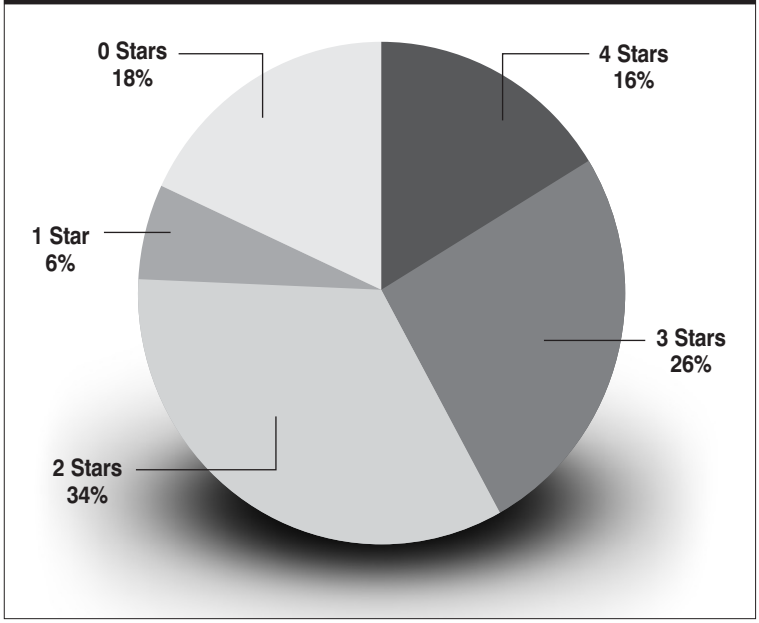
To provide a more comprehensive measure of mid-term outcomes from ATP funding, the program developed a Composite Performance Rating System and compiled and published ratings of the first fifty completed ATP projects. Under the Composite Performance Rating System, each project is scored on a set of measures of knowledge creation, dissemination, and progress toward commercial goals; these are summarized in the table below.

ATP's Composite Performance Rating System: Component Measures of Rating

Knowledge Creation and Dissemination Measures	Commercialization Progress Measures
• Technical awards	• New product/process in market or expected soon
• Collaborations	• Attraction of capital
• Patent filings	• Employment gains
• Publications and presentations	• Business awards
• New product/process in market or expected soon	• Outlook

The results from all these measures are used to construct a composite performance score to indicate the overall project effectiveness against ATP's mission (measured two to three years after the end of ATP funding). The result is a four-star system of ratings, with scores ranging from zero to four stars. The results of this analysis for the first 50 completed ATP projects found that 16 percent of the projects are top-rated in terms of overall project performance, with four stars. Twenty-four percent are in the bottom group of zero or one stars. Sixty percent make up the middle group. Over the next several fiscal years NIST expects to continue evaluating the pipeline of completed ATP projects, applying the rating system to all projects two to three years after they have completed their ATP funding cycle. NIST will include the results of this ongoing evaluation in future performance plans and reports.

Results from Composite Performance Ratings
First 50 Completed ATP Projects



Not all ATP projects are fully successful. Given the program's emphasis on funding high-risk, technology development projects that the private sector is unlikely to fund alone—but which have the potential to result in broad-based benefits for the U.S. economy—dictates that most projects will fail to accomplish all their goals. Some projects are stopped before completion of the funding period. Others fail to meet all their technical goals, or encounter business difficulties before the technologies are commercialized.

Program Evaluation

Visiting Committee on Advanced Technology (VCAT)

To supplement its comprehensive internal evaluation methods, the ATP receives external review and evaluation. The program objectives and management of ATP are reviewed regularly by VCAT, a legislatively mandated panel of advisors that meets quarterly to review NIST's general policy organization, budget, and programs, and by the ATP Advisory Committee. The ATP Advisory Committee is charged with: (1) providing advice on ATP programs, plans, and policies; (2) reviewing ATP's efforts to assess the economic impact of the program; (3) reporting on the general health of the program and its effectiveness in achieving its legislatively mandated mission; and (4) functioning solely as an advisory body, in accordance with the provisions of the Federal Advisory Committee Act.

National Research Council (NRC)

Over the past decade, ATP has been the subject of external reviews focused on program performance, including two broad program reviews by NRC Board on Science, Technology, and Economic Policy. The results of the first NRC review are available in a report entitled *The Advanced Technology Program: Challenges and Opportunities*, published in 1999 and online at http://www.nap.edu/books/0309067758/html/. The second report from the NRC review, *The Advanced Technology Program: Assessing Outcomes*, is available online at http://www.nap.edu/books/030907410X/html/. The NRC found, among other things, that:

- "…the Advanced Technology Program is an effective Federal partnership program…Its cost-shared, industry-driven approach to funding promising new technological opportunities has shown considerable success in advancing technologies that can contribute to important societal goals such as improved health diagnosis (e.g., breast cancer detection), developing tools to exploit the human genome (e.g., colon cancer protection), and improving the efficiency and competitiveness of U.S. manufacturing" (Summary of Findings, p. 87).

- "The extensive assessments of the program show that it appears to have been successful in achieving its core objective, that is, enabling or facilitating private sector R&D projects of a type, or in an area, where social returns are likely to exceed private returns to private investors" (p. 88).

The report also offers additional findings and a series of recommendations for ATP intended to further improve the effectiveness of the program and to enhance cooperation with other federal and state initiatives.

PART

During the FY 2004 budget cycle, ATP was among the first programs evaluated by OMB using the new PART. Overall OMB rated ATP "adequate," and highlighted the following:

- ATP is a well-managed program with adequate strategic planning and regular performance reviews;

- ATP has an open and competitive grant process; and

- ATP's annual performance measures are adequate and results show progress over time.

ATP scored lowest in the "program purpose and design" and "results" section of the PART, reflecting OMB's assessment that the need for the program is unclear and that the program's results, while showing progress, may not indicate "unique or significant impact." OMB did not make any specific recommendations for ATP program management to implement.

Performance Goal 4: Improve the Technological Capability, Productivity, and Competitiveness of Small Manufacturers (NIST)

Corresponding Strategic Goal

Strategic Goal 2: Provide infrastructure for innovation to enhance American competitiveness.

Rationale for Performance Goal

Operating under the authority of 15 U.S.C. 278k, the Manufacturing Extension Partnership (MEP) is a federal-state-local partnership program that provides small U.S. manufacturers with access to manufacturing technologies, resources, and expertise. The MEP program consists of a nationwide network of manufacturing extension centers which are linked to state, university, and private sources of technology and expertise to assist small manufacturers in adopting new and advanced manufacturing technologies, techniques, and business practices.

The nation's 350,000 small manufacturers employ approximately 12 million people—about two-thirds of the manufacturing workforce—and produce intermediate parts and equipment that contribute more than half of the value of U.S. manufacturing production. Their role in manufacturing supply chains means that the nation's future manufacturing productivity and competitiveness will rest largely on the ability of these small establishments to improve their quality, raise their efficiency, and lower their costs. The national MEP network helps small companies transform themselves into high-performance enterprises—productive, innovative, customer-driven, and competitive—by efficiently providing high value technical and advisory services including access to industry best practices.

MEP's ultimate goal is to measurably improve the productivity and competitiveness of all its clients. Through an annual client survey, MEP reports on performance measures that track the impact of MEP assistance on several major business indicators, including (1) increased sales attributed to MEP assistance, (2) capital investment attributed to MEP assistance, and (3) cost savings attributed to MEP assistance.

MEP Impact: Improving the Productivity of Small Manufacturing Establishments

The model below demonstrates the impact path (or value creation chain) of the MEP Program—from inputs such as appropriated funds and staff to end-outcomes such as productivity improvements for the small manufacturing sector. In addition, the model also depicts how NIST measures the progress of the MEP program along its impact chain.

MEP's Impact Path and Evaluation Methods: Results-based Management for Advisory Services

Measure 4a: Number of Clients Served by Manufacturing Extension Partnership (MEP) Centers Receiving Federal Funding				
	FY 2000	FY 2001[1]	FY 2002[1]	FY 2003
Target	New	New	21,543	16,684
Actual	20,903	21,420	16,902	Available December 2004
Met/Not Met			Not Met	

[1] *FY 2001 and FY 2002 data for this measure have been adjusted from previously reported figures. Actual counts published in the FY 2004 Annual Performance Plan (APP) were the result of an error in reporting correct data provided by MEP. (Projected data were not replaced with actual data). The revised figures (shown above) accurately represent the number of clients served in FYs 2001 and 2002.*

Explanation of Measure

This measure represents the annual number of new and repeat clients MEP centers served through training, technical, and business assistance. Interactions with clients may range from informational seminars and training classes to in-depth technical assistance in areas such as lean implementation, ISO 9000, and quality improvement practices.

FY 2003 targets shown above are based on the actual FY 2003 funding received. Targets were not published in the FY 2003 Annual Performance Plan (APP) reflecting the President's budget request to fund only the MEP centers that are less than seven years old and MEP's intention to revise its entire performance management system as a result.

FY 2003 Performance

Due to MEP's data collection process, final data for FY 2003 data for this measure will be reported in the FY 2004 PAR. For FY 2002, the number of clients served by MEP centers represents 78 percent of the anticipated target. The decline is largely due to the adverse business climate during this reporting period. When facing declining demand and lower revenues, manufacturing firms will historically tend to postpone new capital investment and other business improvement strategies that involve near-term cost and longer-term benefits. While the overall number of clients were lower than expected, the business impacts reported by clients using MEP services in FY 2002 were significant.

Measure 4b: Increased Sales Attributed to Manufacturing Extension Partnership (MEP) Assistance				
	FY 2000	FY 2001	FY 2002	FY 2003
Target	$670M	$708M	$726M	$522M
Actual	$698M	$636M	$891M	Available December 2004
Met/Not Met	Met	Not Met		

Measure 4c: Capital Investment Attributed to Manufacturing Extension Partnership (MEP) Assistance				
	FY 2000	FY 2001	FY 2002	FY 2003
Target	$864M	$913M	$910M	$559M
Actual	$873M	$680M	$876M	Available December 2004
Met/Not Met	Met	Not Met		

Measure 4d: Cost Savings Attributed to Manufacturing Extension Partnership (MEP) Assistance				
	FY 2000	FY 2001	FY 2002	FY 2003
Target	$545M	$576M	$497M	$363M
Actual	$482M	$442M	$645M	Available December 2004
Met/Not Met	Not Met	Not Met		

Explanation of Measures

The goal of MEP is to assist small manufacturing establishments overcome barriers to productivity growth and improving their overall competitiveness by providing information, decision support, and implementation assistance to help those businesses adopt new and more advanced manufacturing technologies, techniques, and business practices. The suite of performance measures reported above allow MEP to track the impact of its services on three key quantitative business indicators that as a set suggest the presence of business changes that are positively associated with productivity and revenue growth and improved competitiveness: (1) increased sales attributed to MEP assistance, (2) capital investment attributed to MEP assistance, and (3) cost savings attributed to MEP assistance. While NIST uses these measures, as a set, to indicate MEP's impact on the competitiveness of its clients, they provide only partial indicators of the overall impact of the MEP Centers.[2] Many of the benefits of MEP's services are intangible, difficult to quantify, and/or are qualitative in nature.

FY 2003 targets shown above are based on the actual FY 2003 funding received. Targets were not published in the FY 2003 APP reflecting the President's budget request to fund only the MEP centers that are less than seven years old and MEP's intention to revise its entire performance management system as a result.

FY 2003 Performance

MEP's data collection process is designed to obtain actual client impacts and as a result client survey data lag by approximately one year. The survey process coupled with the new time line for producing the PAR precludes the reporting of actual FY 2002 or FY 2003 data. The FY 2002 data reported below represents a combination of three quarters of actual client reported impacts and one quarter of ***estimated*** client impacts. The estimate is based on the final quarter of FY 2001 survey data and has been adjusted to reflect the number of clients anticipated in the final FY 2002 survey quarter. Final FY 2002 data will be available the end of December 2003 and will be reported in the FY 2004 PAR.

[2] *Reported data reflect the impact of MEP services primarily on small manufacturing establishments; on some occasions, Centers will elect to serve establishments with over 500 employees. Based on recently compiled survey data, approximately 95 percent of the clients served by MEP are small establishments with fewer than 500 employees; these clients account for approximately 93 percent of the attributed sales impacts.*

Final explanations of performance will be provided once final data become available the end of December 2003. The data available to date indicate that MEP continues to demonstrate a strong positive impact on the competitiveness of the manufacturing firms it has served. In terms of specific indicators, clients reported significant increases in sales (Measure 4a) and cost savings (Measure 4d), most likely due to a change in the mix of business services offered and other factors such as more in-depth client interactions. For measure 4b, *Capital Investment Attributed to MEP Assistance*, client reported impacts represent 96 percent of the anticipated target. This degree of variability is within the range of uncertainty involved in forecasting outcomes. To the extent performance is lower than expected, it is most likely due to the overall reluctance of manufacturers to make significant capital investment due to current economic conditions.

Program Evaluation

Economic Studies

The MEP program provides the resources small manufacturing establishments need to overcome cost and knowledge barriers to realize productivity growth. The program's progress toward achieving its fundamental objective has been evaluated through rigorous, controlled-comparison studies that evaluate the productivity of MEP-served clients relative to similar companies that did not receive MEP assistance.

A five-year pilot study conducted by R.S. Jarmin of the Center for Economic Studies (U.S. Census Bureau) showed that MEP assisted clients had significantly higher rates of productivity growth than non-MEP clients ($484M in additional value added for client firms).[3] A recently unpublished update to this original study also prepared by the Center for Economic Studies found that the average MEP client experienced 5.2 percent higher productivity growth between 1996 and 1997 and 4.7 percent faster employment growth compared to non-MEP clients. The findings cover a larger subset of all MEP clients.

External Reviews

National Academy of Public Administration (NAPA)

In FY 2003, NAPA, an independent, nonpartisan organization chartered by Congress to improve government performance, completed the first phase of a two-part review of the MEP program. The first phase focused on re-examining MEP's core premise—that there are barriers that prevent small manufacturers from obtaining the technical and business advice that they need to improve their productivity and overall competitiveness. Findings from the first phase of the study include:

> "…barriers to improving the productivity of small manufacturers identified by earlier studies remain, although they have changed in their relative impacts. Additionally, several other factors have grown in importance and in some ways have made the challenges regarding small manufacturer improvement efforts more difficult. There are further opportunities for improving the way services are provided, yet the MEP Program does perform in a capable and effective manner, delivering impacts significantly beyond the costs of operating the program. The Panel finds that the core premise of the Program remains viable as it is fulfilling its mission by leveraging both public and private resources to assist the nation's small manufacturers." (p. 1)

The full report is available on NAPA's Web site at: http://www.napawash.org/Pubs/NIST0903.pdf. The second phase (to be completed in February 2004) will identify the advantages and disadvantages of alternative business models for providing the needed services and maximizing performance.

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[3] *R.S. Jarmin, "Evaluating The Impact Of Manufacturing Extension On Productivity Growth," **Journal Of Policy Analysis And Management,** Vol 18, No. 1, Winter 1999, pp. 99-119.*

Visiting Committee on Advanced Technology (VCAT)/MEP National Advisory Board

As with other NIST programs, the program objectives and management of MEP are reviewed regularly by VCAT, a legislatively mandated panel of advisors that meets quarterly to review NIST's policies, organization, budget, and programs. MEP also is reviewed by its National Advisory Board (MEPNAB), established by the Secretary of Commerce to (1) provide advice on MEP programs, plans, and policies; (2) assess the soundness of MEP plans and strategies; (3) assess current performance against MEP program plans; and (4) function solely in an advisory capacity, and in accordance with the provisions of the Federal Advisory Committee Act. The MEPNAB members bring a variety of backgrounds to the board, including small and large manufacturing, labor, academia, economic development, consulting, and state government. This mix provides MEP with the outside advice critical to maintaining and enhancing the program's focus on its customers—U.S. smaller manufacturers.

PART

In conjunction with the FY 2004 budget, MEP was evaluated by OMB using the PART instrument. OMB's evaluation of MEP was positive, with an overall rating of "moderately effective." Through the PART assessment, OMB highlighted the following:

- MEP is a well-managed program with adequate strategic planning and regular performance reviews;
- MEP has an open and competitive process for the establishment of new centers; and
- MEP's annual performance measures are adequate and show the program has achieved results.

MEP scored lowest in the "program purpose and design" section of the PART, reflecting OMB's assessment that "it is not evident that there is a clear need for a Federal response in this area." OMB did not make any specific recommendations for MEP program management to implement.

Performance Goal 5: Assist U.S. Businesses and Other Organizations in Continuously Improving their Productivity, Efficiency, and Customer Satisfaction by Adopting Quality and Performance Improvement Practices (NIST)

Corresponding Strategic Goal

Strategic Goal 2: Provide infrastructure for innovation to enhance American competitiveness.

Rationale for Performance Goal

Quality and performance improvement have become requirements—not options—for competitive businesses and high-performance organizations of all types. Through BNQP, NIST provides a systematic, well-tested set of business values, performance criteria, and assessment methods that all organizations can use to improve their productivity and effectiveness. Overall, BNQP catalyzes the business community to define what organizations must do to improve their performance and attain (or retain) market leadership, and provides a mechanism for broadly disseminating that information.

FY 2003 Performance

Due to data collection systems, final FY 2003 data for BNQP output metrics will be reported in the FY 2004 PAR. In FY 2002, BNQP actual results did not meet anticipated targets. A portion of the discrepancy between target levels and actual performance may reflect external factors such as the overall state of the economy in FY 2002. However, the primary issue involves the measures used to report performance. There are inherent difficulties involved with collecting data and forecasting the performance of state and local programs. Data from state programs is uneven and can take months to collect. For example, in January 2003, BNQP requested information on these metrics from 49 state, regional, and local quality award programs. Providing data is voluntary and 39 programs responded. Of these, one program reported that its application information is confidential; five did not report application data; and four indicated that they did not operate an award cycle in 2002.

The discrepancy between target levels and actual performance for Measure 5b, Number of Criteria Mailed, reflects BNQP and the state, regional, and local quality award programs focus on using the Internet as the primary method for disseminating the Baldrige *Criteria*. This shift to predominantly on-line dissemination has significantly decreased the number of Baldrige *Criteria* mailed but resulted in large volumes of on-line dissemination. For example, in FY 2003, BNQP alone disseminated over 884,000 copies of the *Criteria* from their Web site. See text box on following page.

For these reasons, BNQP is in the process of developing new, more meaningful performance measures that better illustrate progress on three core BNQP objectives: (1) improving overall customer satisfaction, (2) increasing participation in the Malcolm Baldrige National Quality Awards (MBNQA), and (3) promoting growth and quality awareness and performance excellence throughout the United States. BNQP will report baseline data on the new set of performance measures in the FY 2004 report.

In FY 2003, BNQP received a significant increase in the number of applications for all categories of the 2003 MBNQA. Sixty-eight organizations applied for the Nation's top honor for excellence. This represents an increase over the 49 businesses, schools, and health care organizations that applied last year. The 68 applicants include 10 large manufacturers, eight service companies, 12 small businesses, 19 education organizations, and 19 health care organizations. The increase reflects continued interest in the award program and increased reach into other sectors. Of the 68 applicants, seven were recently selected to receive the award for performance excellence. The 2003 Baldridge Award recipients are:

- *Medrad, Inc.*, Indianola, Pa. (manufacturing);
- *Boeing Aerospace Support*, St. Louis, Mo. (service);
- *Caterpillar Financial Services Corp.*, Nashville, Tenn. (service);
- *Stoner Inc.*, Quarryville, Pa. (small business);
- *Community Consolidated School District 15*, Palatine, Ill. (education);
- *Baptist Hospital, Inc.*, Pensacola, Fla. (health care); and
- *Saint Luke's Hospital of Kansas City*, Kansas City, Mo. (health care).

Measure 5a: Number of Applications to the Malcolm Baldrige National Quality Award (MBNQA) and Baldrige-based State and Local Quality Awards

	FY 2000	FY 2001	FY 2002	FY 2003
Target	916	935	954	1,110
Actual	911	646	444	Available in FY 2004 PAR
Met/Not Met	Not Met	Not Met	Not Met	

Measure 5b: Number of Baldrige Criteria for Performance Excellence Mailed by Baldrige National Quality Program (BNQP) and Baldrige-based State and Local Quality Programs

	FY 2000	FY 2001	FY 2002	FY 2003
Target	197,600	193,600	191,700	177,870
Actual	176,248	164,949	124,757	Available in FY 2004 PAR
Met/Not Met	Not Met	Not Met	Not Met	

Explanation of Measures

Baldrige Criteria: Online Dissemination

The Baldrige National Quality Program tracks the number of times its *Criteria for Performance Excellence* documents were downloaded via the web [http://www.quality.nist.gov]. In FY 2003, the three types of Baldrige *Criteria*—for business, healthcare, and education—**were downloaded over 884,000 times**. This total demonstrates the very high level of dissemination of the *Criteria*, especially when considered in conjunction with the number of Baldrige documents distributed via mail. However, this count should not be interpreted as the number of distinct users who have read or utilized the documents. It is a direct count of the number of times the documents were downloaded in Adobe Acrobat form. For technical and privacy reasons, it is not possible to determine the number of unique users, if the document was printed, or how long each user spent on the site.

The BNQP currently reports two key output metrics: (1) the total number of applications to the MBNQA and Baldrige-based state and local awards, which reflects high-level corporate commitment to quality and high-performance business practices throughout the country; and (2) the number of printed BNQP *Criteria for Performance Excellence* documents that are distributed by BNQP and Baldrige-based state and local quality programs, which illustrates the dissemination of BNQP concepts and methods. While these metrics illustrate progress on core BNQP objectives, the data are only partial representations of BNQP's output. The application count does not capture the large number of organizations that use Baldrige *Criteria* internally but do not formally apply for MBNQA or state awards. The number of documents mailed also does not capture additional dissemination channels, such as electronic acquisition and dissemination, reproduction of the Baldrige *Criteria* in textbooks, articles, and other documents, and secondary modes of copying and distribution. This is one reason why "number of Baldrige *Criteria* mailed" (Measure 6b) indicates a downward trend over time; as more copies of the *Criteria* are distributed via the Internet, the program expects to mail fewer documents (see text box for additional information about electronic distribution). Moreover, direct counts of Baldrige *Criteria* do not capture various formal and informal ways in which BNQP concepts can be disseminated, such as through academic programs, consulting channels, business and organizational management literature, etc.

Program Evaluation

Economic Studies

Economics professors Albert N. Link, of the University of North Carolina, and John T. Scott, of Dartmouth College, recently examined the MBNQA program and estimated the total economic benefits of the program at almost $25 billion, for a benefit-to-cost ratio of 207 to 1. They determined the total operational costs, including the value of executives' volunteered time to review applications, to be $119 million. Through 2000, 41 companies had received the Baldrige National Quality Award, and NIST had received 785 applications. However, thousands of other organizations of all sizes and in all sectors of the economy have benefited by using the Baldrige *Criteria* as the foundation for performance management and quality improvement programs. Thousands of paper and electronic copies of the *Criteria* are disseminated each year to organizations across the country. Professors Link and Scott examined data from a survey of corporate members of the American Society for Quality (ASQ). They estimated the total benefits to the ASQ members from using the *Criteria* to be $2.17 billion. To determine the benefits to the economy as a whole, they extrapolated the ASQ data based on the assumption that other companies in the economy benefit to the same extent as ASQ member companies.

External Review

In general, the program objectives and management of the BNQP are reviewed by VCAT, a legislatively mandated panel of advisors that meets quarterly to review NIST's general policy organization, budget, and programs. In addition, the performance of BNQP is evaluated by the Board of Overseers, a federal panel of national quality experts from business and academia that advises the Secretary of Commerce. An important part of the board's responsibility is to assess how well BNQP is serving the national interest. The board reviews all aspects of BNQP, including the adequacy of the Baldrige *Criteria* and processes for making Baldrige Awards, and reports its recommendations to the Secretary

NIST-wide External Program Review and Oversight

The program goals and management policies of NIST as a whole, including each of its major programs, are reviewed regularly by VCAT. VCAT is a legislatively mandated panel of external advisors that meets quarterly to review NIST's general policy, organization, budget, and programs. The current list of VCAT members is provided in the text box. Additional information, including VCAT's annual report, is available at http:// www.nist.gov/director/vcat/index.htm

NIST Visiting Committee on Advanced Technology (VCAT): Current Membership – 2003

Mr. Gary Floss, Business Partner, Bluefire Partners

Dr. Richard M. Gross, Vice President

Research & Development, The Dow Chemical Company

Dr. Deborah L. Grubbe, Corporate Director, Safety & Health, DuPont Safety, Health, Environment

Dr. Lloyd R. Harriott, Professor, Dept. of Electrical and Computer Engineering, University of Virginia

Dr. Lou Ann Heimbrook, Vice President

Global Operations, Merck Research Laboratories

Dr. Jennie Hunter-Cevera, President, University of Maryland Biotechnology Institute

Dr. Thomas A. Manuel, President, Council for Chemical Research

Dr. Wayne H. Pitcher, Jr. , Technology Management Consultant

Dr. F. Raymond Salemme, Founder, President, and Chief Scientific Officer, 3-Dimensional Pharmaceuticals, Inc.

Dr. Juan M. Sanchez, VCAT Chair, Vice President for Research, University of Texas, Austin

Dr. April M. Schweighart, Product Business Manager, Motorola

NIST Visiting Committee on Advanced Technology (VCAT): Current Membership – 2002

Mr. Gary Floss, Business Partner, Bluefire Partners

Dr. Deborah L. Grubbe, Corporate Director, Safety & Health, DuPont Safety, Health, Environment

Dr. Lloyd R. Harriott, Professor, Dept. of Electrical and Computer Engineering, University of Virginia

Dr. Jennie Hunter-Cevera, President, University of Maryland Biotechnology Institute

Dr. Caroline A. Kovac, Vice President, Services, Applications and Solutions, IBM

Dr. Thomas A. Manuel, President, Council for Chemical Research

Dr. Wayne H. Pitcher, Jr. , Technology Management Consultant

Dr. F. Raymond Salemme, Founder, President, and Chief Scientific Officer, 3-Dimensional Pharmaceuticals, Inc.

Dr. Juan M. Sanchez, VCAT Chair, Vice President for Research, University of Texas, Austin

Dr. April M. Schweighart, Product Business Manager, Motorola

Dr. Masayoshi Tomizuka, Director, , Engineering Systems Research Center, University of California, Berkeley

Performance Goal 6: Enhance Public Access to Worldwide Scientific and Technical Information through Improved Acquisition and Dissemination Activities (NTIS)

Corresponding Strategic Goal

Strategic Goal 2: Provide infrastructure for innovation to enhance American competitiveness.

Rationale for Performance Goal

The National Technical Information Service (NTIS) operates a central clearinghouse of scientific and technical information that is useful to U.S. business and industry. Without appropriated funds, NTIS collects scientific and technical information; catalogs, abstracts, indexes, and permanently archives the information; disseminates products in the forms and formats most useful to its customers; develops electronic and other new media to disseminate information; and provides information processing services to other federal agencies. NTIS's revenue comes from (1) the sale of technical reports to business and industry, schools and universities, state and local government offices, and the public at large and (2) from services to federal agencies that help them communicate more effectively with their employees and constituents.

NTIS continues to meet the challenge of permanent preservation of and ready access to the taxpayers' investment in R&D through the acquisition, organization, and preservation of the titles added annually to the permanent collection. NTIS promotes the development and application of S&T by providing technologically advanced global e-commerce channels for dissemination of specialized information to business, industry, government, and the public. NTIS is implementing a new initiative to provide the public with increased access to government information. The NTIS bibliographic database (from 1990 to the present) is available via the Internet free of charge. NTIS allows users to download any item in its collection that NTIS has in electronic format for a single low fee, or at no charge if it is less than 20 pages. In addition NTIS has created links that hyper-link customers to other agency Web sites that offer documents for free download. These recent developments and initiatives are a result of NTIS's new business model that maximizes utilization of the World Wide Web and e-commerce in its information collection and dissemination activities.

NTIS collects its material primarily from U.S. Government agencies, their contractors, and grantees, as well as from international sources. The NTIS permanent collection includes approximately three million titles, including reports describing the results of federally sponsored research, statistical and business information, audiovisual products, computer software, and electronic databases developed by federal agencies, and reports prepared by foreign research organizations. NTIS maintains a permanent repository of these information products as well as offering approximately 500,000 online electronic items to its many customers, primarily researchers and business managers in private industry. The disseminated materials may include computer downloads, paper, microfiche, audiovisual, and electronic media.

Collection of scientific and technical information from various contributors, and dissemination of that information to an even larger audience is highly dependant on external factors, and therefore not entirely controllable. For example, the amount of new material available is highly dependent on budgetary and program decisions made by other agencies. NTIS's efforts to ensure the public easy access to available scientific and technical information through enhanced acquisition and dissemination activities are implemented and monitored through the following performance measures.

FY 2003 Performance

In FY 2003, NTIS had one goal and three measures. Of those measures, NTIS met two. Implementation of NTIS's new business model, which focuses on its mission of disseminating information, stimulating innovation and discovery, and thus supporting economic growth and job creation, has been a major influence on the success of those two performance measures. The one measure not met has been addressed below, and steps have already been taken to correct the performance in the future. NTIS managers will continue to closely monitor the Bureau's performance and remain responsive to necessary changes in the overall operation.

Measure 6a: Number of New Items Available (Annual)				
	FY 2000	FY 2001	FY 2002	FY 2003
Target	New	New	510,000	520,000
Actual		505,068	514,129	530,910
Met/Not Met			Met	Met

Explanation of Measure

The number of items available for sale to the public from NTIS includes scientific, technical, and engineering information products added to the permanent collection, as well as items made available through online electronic subscriptions.

Each publication added to the permanent collection is abstracted, catalogued, and indexed so that it can be identified and merged into the permanent bibliographic database for future generations of researchers and the public who may benefit from this valuable research. Other information products are available as full text documents in electronic format through numerous NTIS online information services. This material is acquired primarily from U.S. Government agencies, their contractors, and grantees, but also from international sources. NTIS collects approximately 30,000 scientific and technical reports annually and another 500,000 items in the form of articles, updates, advisories, etc. that are contained in various subscription products and databases it distributes. The number of new information products available each year from NTIS is approximately 530,000, but the number largely depends on input from other government agencies.

FY 2003 Performance

NTIS has expanded and refined its efforts to acquire new scientific and technical information products by harvesting products from the World Wide Web. These harvesting efforts together with increased availability of online electronic subscription products demonstrate NTIS's success in making new products available to the public.

Measure 6b: Number of Information Products Disseminated (Annual)				
	FY 2000	FY 2001	FY 2002	FY 2003
Target	New	New	16,000,000	17,000,000
Actual		14,524,307	16,074,862	29,134,050
Met/Not Met			Met	Met

Explanation of Measure

This measure represents information disseminated and includes compact discs, diskettes, tapes, online subscriptions, Web site pages, as well as the traditional paper and microfiche products.

The shift in information dissemination practices from traditional paper copy to electronic-based dissemination has improved NTIS's ability to provide quality products, to increase the number of products distributed, and expand the number of customers that have access to valuable scientific and technical information. NTIS is continually striving to stay abreast of the latest technological advances in information dissemination processes to improve its ability to meet the demands of the public. NTIS has implemented an initiative that enables customers to locate and download information directly from the originating agency's Internet site. NTIS continues to enhance its ability to stay current in the e-commerce environment, while continuing to serve customers that require the more traditional distribution methods, as demonstrated in our targets above.

FY 2003 Performance

Due to the shift in information dissemination practices from traditional paper copy to electronic-based dissemination, NTIS implemented a new business model that takes advantage of the opportunities offered by the World Wide Web. The new business model was designed to increase information dissemination opportunities by expanding NTIS' customer base and increasing demand for its products. In addition to the added benefit generated from the business plan, expectations of electronic-based dissemination have far exceeded our original targets, as demonstrated in the performance measure above.

Measure 6c: Customer Satisfaction				
	FY 2000	FY 2001	FY 2002	FY 2003
Target	New	New	97%	98%
Actual		97%	98%	97%
Met/Not Met			Met	Not Met

Explanation of Measure

This measure represents the percentage of NTIS customers that are satisfied with the quality of their order, the ease of order placement, and the timely processing of that order. Orders for NTIS's vast collection of scientific and technical information are received by phone, e-mail, fax, mail, and online, and are filled in a variety of formats. NTIS's continual efforts to maintain and possibly improve this very high rate of customer satisfaction are a top priority.

The percentage of satisfied customers is derived from the number of customer complaints compared to the total number of orders taken. It does not take into account inquires about the status of an order or other general questions.

FY 2003 Performance

NTIS's customer satisfaction performance has declined slightly in FY 2003. The decline can be attributed to two problems that arose during the year that drove the number of customer complaints above anticipated levels. One transpired as a result of order input into the order processing system from a source that hadn't been correctly coordinated, and the other involved an order processing system failure caused by antiquated hardware. NTIS' Office of Customer Service and the Office of

Information Services reacted immediately to both circumstances to correct the orders that had already gone astray and implemented preventive measures for all future orders. The aging hardware supporting the order processing system is being replaced as quickly as possible, and should be fully functional by January 2004. NTIS will continue to place the highest priority on ordering and delivery capabilities to ensure the highest level of customer satisfaction.

Program Evaluation

The Office of the Inspector General (OIG) prepared an evaluation of NTIS's new business model. The model reflects NTIS's commitment to maximize dissemination of unclassified scientific, technical, engineering, and business-related information to U.S. business, industry, and the public. OIG's recommendations were: (1) make clear that there are major uncertainties associated with the business model's estimates during future discussions and presentations of the model, (2) periodically review the projections to determine whether they are realistic and achievable, and (3) evaluate the impact of the new business model on NTIS's operations on a monthly basis, and determine whether the new model is achieving the desired results or whether modifications are needed.

TA Data Validation and Verification

NIST's Program Office conducts an annual review of its quantitative performance data to ensure that they are complete and accurate. During this process, Program Office staff members discuss the data with appropriate offices to assess results relative to forecasts and to understand long-term trends and drivers of performance. Program Office staff also evaluate the verification and validation procedures used by the offices that provide the source data and verify that the source data are identical to or consistent with the reported data. A set of NIST's quantitative performance measures and OIG audited associated verification and validation procedures recently, and NIST has implemented the suggestions for improvement identified in that audit.

For its qualitative performance measure, the NIST Program Office provides summary findings from the annual NRC review of the NIST laboratories; the complete results of that evaluation are available for public review. The Program Office also provides the results from economic impact studies, which are conducted by external economists and technical specialists using well-developed research methods and standard economic and business analysis metrics, as specified and monitored by NIST.

The table starting on the following page summarizes the data validation and verification processes for each organization in TA.

TA Data Validation and Verification

Performance Measure	Data Source	Frequency	Data Storage	Verification	Data Limitations	Actions to be Taken
Measure 1a: Support and improve the American innovation system	Office of the Under Secretary/Office of Technology Policy (US/OTP)	OTP performance is cumulative and is reported annually.	OTP	Data represent verifiable tabulations of OTP activities.	Output only	OTP continues to refine this measure. During FY 2003 and FY 2004, it will be integrated into four other measures.
Measure 1b: Advance the role technology plays in U.S. economic growth and homeland security	OTP	OTP performance is cumulative and is reported annually.	OTP	Data represent verifiable tabulations of OTP activities. For reporting activities, data are gathered and analyzed by technology policy analysts using accepted analytical practices, are submitted for peer review to other Commerce bureaus, other agencies, and academia, as appropriate, prior to publication.	Elements of some of OTP's analyses must rely on anecdotal data. Such instances are clearly identified in the reports provided by OTP.	OTP continues to refine this measure. Because it is an integral part of all of OTP's activities and mission, during FY 2003 and FY 2004 this measure will be integrated into four improved measures.
Measure 1c: Strengthen the competitive position of U.S. technology industries **Measure 1d:** Strengthen the Office of the Under Secretary/Office of Technology Policy's (US/OTP) organization, capabilities, and resources to maximize the effectiveness of its activities and services	OTP	OTP performance is cumulative and is reported annually.	OTP	Data represent verifiable tabulations of OTP activities.	Output Only	Due to the integral nature of this measure to OTP's activities, in FY 2003 and FY 2004 it will be incorporated and integrated into four improved measures.
Measure 2a: Qualitative assessment and performance evaluation using peer review	On-site interviews and discussions with NIST management and research staff by independent external scientific and technical experts, managed by the National Research Council (NRC).	Annual	NRC	Verification and oversight of laboratory-specific expert review panels provided by the NRC Board on Assessment of NIST Programs.	Data are qualitative in nature.	None

TA Data Validation and Verification *(cont.)*

Performance Measure	Data Source	Frequency	Data Storage	Verification	Data Limitations	Actions to be Taken
Measure 2b: Economic impact studies	Research is contracted to economic and technical experts, who generate quantitative estimates and qualitative information using performance data gathered through industry surveys and field research. Project cost data are supplied by NIST.	Intermittent	Contractors collect and maintain all data. Survey results, cost data, and all calculations are presented in final reports.	Data are gathered and analyzed by highly qualified economists and technical specialists using well-developed research methods and standard economic and business analysis metrics, as specified and monitored by NIST.	Elements of study populations often are too diffuse to measure; availability and quality of industry data often are uneven; impact estimation typically requires counterfactual data, which can be difficult to estimate; outcomes are specific to each project—i.e., results are not cumulative and not readily comparable.	None
Measure 2c: Standard Reference Materials (SRM) available	NIST SRMs Program	Ongoing	NIST SRMs Program	Data represent direct and verifiable counts of SRMs available to customers at the close of the fiscal year. Internal verification includes review by NIST Technology Services and the NIST Director's Office and Budget Division.	Output only	There are no obvious replacements for these output tabulations; NIST is in the process of developing new output measures focused on the use of and demand for NIST measurements and standards.
Measure 2d: Standard Reference Data (SRD) titles available	NIST SRD Program	Ongoing	NIST SRD Program	Data represent a direct and verifiable count of SRD products developed and disseminated by NIST. Internal verification includes review by NIST Technology Services and the NIST Director's Office and Budget Division.	Output only	There are no obvious replacements for these output tabulations; NIST is in the process of developing new output measures focused on the use of and demand for NIST measurements and standards.
Measure 2e: Number of items calibrated	NIST Calibration Program	Ongoing	NIST Calibration Program	Data represent direct and verifiable counts of items calibrated by the NIST Laboratories. Internal verification includes review by NIST Technology Services and the NIST Director's Office and Budget Division.	Output only	There are no obvious replacements for these output tabulations.

TA Data Validation and Verification *(cont.)*

Performance Measure	Data Source	Frequency	Data Storage	Verification	Data Limitations	Actions to be Taken
Measure 2f: Technical publications produced	NIST Office of Information Services	Ongoing	Publications data are gathered and maintained by NIST Office of Information Services.	Data represent direct and verifiable counts of NIST technical publications that have been cleared for publication by the internal Washington and Boulder Editorial Review Boards. Internal verification includes review by the NIST Director's Office.	Output only	NIST is developing new measures focused on the quality and utility of NIST's technical publications.
Measure 3a: Economic impact studies	Research is contracted to economic and technical experts, who generate quantitative estimates and qualitative information using performance data gathered through industry surveys and field research.	Intermittent	Contractors collect and maintain all data. Survey results, cost data, and calculations are presented in final reports.	Data are gathered and analyzed by highly qualified economists and technical specialists using well-developed research methods and standard economic and business analysis metrics, as specified and monitored by NIST.	Elements of study populations often are too diffuse to measure; availability and quality of industry data often are uneven; impact estimation typically requires counterfactual data, which can be difficult to estimate; outcomes are specific to each project—i.e., results are not cumulative and not readily comparable.	None
Measure 3b: Cumulative number of technologies under commercialization **Measure 3c:** Cumulative number of publications **Measure 3d:** Cumulative number of patents filed	Data are gathered from the portfolio of Advanced Technology Program (ATP) project participants (funded since 1993) through company filings of patent information to the NIST Grants Office (a legal requirement) and an electronic survey instrument under ATP's Business Reporting System (BRS). Separate portfolio-based telephone surveys are conducted of project participants funded prior to 1993 and for post-project data collection.	Annual over the course of ATP funding for projects funded since 1993; intermittent for projects funded prior to 1993; every two years (up to six years) after ATP funding ends.	ATP's Office of Economic Assessment maintains BRS data in an integrated set of databases covering both descriptive information about the funded organizations and survey responses for all participants in ATP-funded research projects.	External auditors have evaluated ATP's Business Reporting System. In addition, all ATP reports using BRS data and patent reports filed through the NIST Grants Office are monitored closely by ATP for research quality and are subject to extensive NIST-wide review and critique prior to being issued. In addition, a recent OIG audit of NIST's performance measures included review of two of these metrics—technologies commercialized and patents filed—and resulted in changes to procedures.	The BRS electronic survey and other telephone survey instruments represent a standardized reporting system. Standard sources of uncertainty include variation in interpretation of specific questions; variation in the estimation techniques used in response to specific questions; variation in the quality of industry data; and missing values.	Administrative procedures have been enacted to increase reliability, per Office of Inspector General (OIG) audit.

TA Data Validation and Verification *(cont.)*

Performance Measure	Data Source	Frequency	Data Storage	Verification	Data Limitations	Actions to be Taken
Measure 4a: Number of clients served by Manufacturing Extension Partnership (MEP) centers receiving federal funding	Data are collected from each MEP-funded center.	Data are collected on a quarterly basis and reporting annually.	NIST MEP	Data are reviewed each quarter by MEP staff.	Output only	None at this time.
Measure 4b: Increased sales attributed to Manufacturing Extension Partnership (MEP) assistance **Measure 4c:** Capital investment attributed to Manufacturing Extension Partnership (MEP) assistance **Measure 4d:** Cost savings attributed to Manufacturing Extension Partnership (MEP) assistance	A private firm, Synovate, located in Arlington Heights, IL, administers the survey.	The survey is conducted four times per year, and clients are selected based on when they completed the first project with an MEP Center in the previous year. For example, a client that completed a project with an MEP Center in February 2001 was surveyed in Jan/Feb 2002. This survey methodology reduces respondent burden, raises overall response rates, and improves data quality. Clients are asked to estimate how the group of MEP-provided services over the previous two years has affected their business performance in the 12-month period prior to the survey date.	Survey data is sent directly to MEP for analysis. MEP reviews and stores survey data received from Synovate.	Internal verification includes significant review of the data by MEP staff. Criteria are in place for identifying and verifying significant outliers in the data. In addition, an OIG audit of NIST's performance measures included a review of one of MEP's measures ("increased sales attributed to MEP assistance"); in response to this audit, NIST implemented some improvements to data verification procedures.	As with similar survey instruments, sources of uncertainty include variation in interpretation of specific questions; variation in the estimation techniques used in response to specific questions; variation in the quality of industry data; missing values; and other common survey problems. Synovate uses standard survey techniques to clean the data, ensure accuracy and reliability, and improve the response rate (which is over 70 percent). Reported data reflect the impact of MEP services primarily on small manufacturing establishments; on some occasions, Centers will elect to serve establishments with over 500 employees.	Verification procedures improved per OIG audit. Decisions about implementing additional improvements to verification procedures depend on a number of factors including the impact of these changes on MEP's relationships with the Centers and clients, cost, and feasibility.

TA Data Validation and Verification *(cont.)*

Performance Measure	Data Source	Frequency	Data Storage	Verification	Data Limitations	Actions to be Taken
Measure 5a: Number of applications to the Malcolm Baldrige National Quality Award (MBNQA) and Baldrige-based state and local quality awards **Measure 5b:** Number of Baldrige Criteria for Performance Excellence mailed by Baldrige National Quality Program (BNQP) and Baldrige-based state and local quality programs	Application data are collected and tracked by the BNQP; some data collected from state and local programs.	Based on the application cycle. Data from state programs are collected annually.	BNQP	Data represent direct and verifiable counts of BNQP business activities and processes. Internal verification includes review by the NIST Director's Office. Data collected from state and local programs may be incomplete.	Output only	NIST is in the process of revising these performance measures. Baselines will be reported in FY 2004.
Measure 6a: Number of new items available (annual)	NTIS operates and maintains internal systems for processing collected information into available products.	Internal management activity reports are produced daily, summaries are produced monthly.	All performance-related information is stored within NTIS systems.	NTIS accounting and budget offices analyze and report performance output data and revenue and cost data to management. Data verification is provided through regular internal and independent auditor reporting.	None	None
Measure 6b: Number of information products disseminated (annual)	NTIS records every transaction using a commercial order processing system modified to meet its specific needs together with a standard Web analysis software package used by industry.	Internal management activity reports are produced daily, summaries are produced monthly.	All performance-related information is stored within NTIS systems.	NTIS accounting and budget offices analyze and report performance output data and revenue and cost data to management. Data verification is provided through regular internal and independent auditor reporting.	None	None
Measure 6c: Customer satisfaction	NTIS records every transaction using a commercial order processing system modified to meet its specific needs, together with internal processes for collecting customer complaint statistics.	Internal management activity reports are produced daily, summaries are produced monthly.	All performance-related information is stored within NTIS systems.	NTIS accounting and budget offices analyze and report performance output data and revenue and cost data to management. Data verification is provided through regular internal and independent auditor reporting.	None	None