

PERFORMANCE INFORMATION

This chapter provides supporting information on the performance activities used in developing NSF's FY 2007 Budget Request. The NSF Strategic Plan for FY 2003-2008 established the overall framework for evaluating NSF's performance through the Ideas, Tools, People, and Organizational Excellence strategic goals. Each of these strategic goals consists of three to four investment categories that are evaluated through the Program Assessment Rating Tool, or PART. The two investment categories assessed for this budget cycle were Fundamental Science and Engineering under the Ideas goal, and Federally Funded Research and Development Centers under the Tools goal.

National Science Foundation By Strategic Outcome Goal and Investment Category (Dollars in Millions)

	FY 2005 Actuals	FY 2006 Current Plan	FY 2007 Request	Change over FY 2006	
				Amount	Percent
<i>Ideas</i>					
Fundamental Science and Engineering	\$2,283.43	\$2,270.88	\$2,413.72	\$142.84	6.3%
Centers Programs	236.67	253.25	259.78	6.53	2.6%
Capability Enhancement	218.98	224.18	241.52	17.34	7.7%
	\$2,739.08	\$2,748.31	\$2,915.02	\$166.71	6.1%
<i>Tools</i>					
Facilities	\$475.13	\$514.32	\$580.30	\$65.98	12.8%
Infrastructure and Instrumentation	466.04	479.40	565.30	85.90	17.9%
Polar Tools, Facilities and Logistics	278.16	306.95	345.56	38.61	12.6%
Federally-Funded R&D Centers	182.10	187.45	194.08	6.63	3.5%
	\$1,399.44	\$1,488.12	\$1,685.24	\$197.12	13.2%
<i>People</i>					
Individuals	\$522.22	\$496.36	\$519.84	\$23.48	4.7%
Institutions	145.28	146.92	146.54	-0.38	-0.3%
Collaborations	394.69	388.38	404.04	15.66	4.0%
	\$1,062.19	\$1,031.65	\$1,070.42	\$38.77	3.8%
<i>Organizational Excellence</i>					
	\$280.07	\$313.09	\$349.53	\$36.44	11.6%
Total, NSF	\$5,480.77	\$5,581.17	\$6,020.21	\$439.04	7.9%

Totals may not add due to rounding.

For NSF and other federal agencies with significant R&D portfolios, assessment activities are required to draw heavily upon the R&D Investment Criteria established by OMB and the Office of Science and Technology Policy. These three criteria, Relevance, Quality, and Performance are described below and are reflected in each of the directorate and office narratives throughout this Budget Request.

- **Relevance:** R&D programs must be able to articulate *why* this investment is important, relevant, and appropriate.
- **Quality:** R&D programs must justify *how* funds will be allocated to ensure quality R&D.
- **Performance:** R&D programs must be able to monitor and document *how well* the investment is performing.

NSF Strategic Goals and Objectives

Ideas

FY 2007 Annual Performance Goal for Ideas: NSF will demonstrate significant achievement for the majority of the following performance indicators related to the Ideas outcome goal:

- Enable people who work at the forefront of discovery to make important and significant contributions to science and engineering knowledge;
- Encourage collaborative research and education efforts – across organizations, disciplines, sectors and international boundaries;
- Foster connections between discoveries and their use in the service of society;
- Increase opportunities for individuals from underrepresented groups and institutions to conduct high quality, competitive research and education activities;
- Provide leadership in identifying and developing new research and education opportunities within and across science and engineering fields;
- Accelerate progress in selected science and engineering areas of high priority by creating new integrative and cross-disciplinary knowledge and tools, and by providing people with new skills and perspectives; and
- Support innovative research on learning and teaching that provides a scientific basis for improving science, technology, engineering and mathematics education at all levels.

Tools

FY 2007 Annual Performance Goal for Tools: NSF will demonstrate significant achievement for the majority of the following performance indicators related to the Tools outcome goal:

- Expand opportunities for U.S. researchers, educators, and students at all levels to access state-of-the-art S&E facilities, tools, databases, and other infrastructure;
- Provide leadership in the development, construction, and operation of major, next-generation facilities and other large research and education platforms;
- Develop and deploy an advanced cyberinfrastructure to enable all fields of science and engineering to fully utilize state-of-the-art computation;
- Provide for the collection and analysis of the scientific and technical resources of the U.S. and other nations to inform policy formulation and resource allocation; and
- Support research that advances instrument technology and leads to the development of next-generation research and education tools.

People

FY 2007 Annual Performance Goal for People: NSF will demonstrate significant achievement for the majority of the following performance indicators related to the People outcome goal:

- Promote greater diversity in the science and engineering workforce through increased participation of underrepresented groups in NSF activities;
- Support programs that attract and prepare U.S. students to be highly qualified members of the global S&E workforce, including providing opportunities for international study, collaborations and partnerships;
- Promote public understanding and appreciation of science, technology, engineering, and mathematics, and build bridges between formal and informal science education; and
- Develop the Nation's capability to provide K-12 and higher education faculty with opportunities for continuous learning and career development in science, technology, engineering and mathematics.

Organizational Excellence

FY 2007 Strategic Goal for Organizational Excellence: NSF will demonstrate significant achievement for all of the following performance indicators related to the Organizational Excellence outcome goal:

- Operate a credible, efficient merit review system;
- Utilize and sustain broad access to new and emerging technologies for business application;
- Develop a diverse, capable, motivated staff that operates with efficiency and integrity; and
- Develop and use performance assessment tools and measures to provide an environment of continuous improvement in NSF's intellectual investments as well as its management effectiveness.

Means and Strategies for Success for NSF Goals in FY 2007

To achieve its strategic outcome goals of Ideas, Tools, People, and Organizational Excellence, NSF supports the best ideas generated by the science and engineering community through awarding merit-based grants and cooperative agreements and encourages partnerships and cooperative research efforts among investigators, institutions, disciplines, and sectors and across international boundaries. The Foundation develops and supports a high-quality, balanced award portfolio that incorporates NSF's core disciplines, priority investments, and new and emerging opportunities, including those that have the potential for transformation. NSF also broadens the impacts of research and education activities by increasing the diversity of individuals and institutions supported.

NSF specifically addresses the Ideas goal through expanded investments in fundamental science and engineering and support of policy-relevant programs to establish the foundations for an evidence-based "science of science policy." NSF also supports the broad interagency and interdisciplinary activities coordinated by the National Science and Technology Council.

NSF specifically addresses the Tools goal through investment in broadly accessible, state-of-the-art infrastructure to meet major research challenges while developing and implementing improvements for selection, management, and oversight of large facility projects. Another primary strategy for NSF is to acquire a leadership-class high performance computing system that will contribute to a world-class computing environment.

NSF specifically addresses the People goal by strengthening the K-12 education portfolio through integrating and consolidating existing programs. NSF will also improve science education at the middle and high school levels and increase support for graduate teaching fellowships.

NSF specifically addresses the Organizational Excellence goal by effectively managing the process of external merit review of an increasingly complex number of proposals; employing new and emerging technologies to improve business applications; supporting continuous learning for staff through training courses and participation in professional meetings; and improving award management and oversight through site visits and outreach to scientific and engineering organizations.

Resources Required

Each of NSF's strategic goals can be achieved with the staff and budgetary resources as presented in the FY 2007 Budget Request.

Prior Year Results for NSF's Strategic Goals

Each of NSF's goals is a continuation of the FY 2006 Strategic Goal based on the NSF Strategic Plan for FY 2003-2008. Each fiscal year's performance indicators may differ from those of prior years, but in all

cases they serve as measures of progress toward achievement of NSF's strategic outcome goals. NSF was successful in achieving the annual performance goal associated with the Ideas, Tools, and People strategic outcomes in FY 2001-2005. Evaluation of achievement includes input from the external Advisory Committee for GPRA Performance Assessment (AC/GPA).

The Organizational Excellence goal is a continuation of the FY 2006 Strategic Goal developed based on the NSF Strategic Plan FY 2003 through FY 2008. NSF achieved the goal in FY 2005. Evaluation of achievement included input from two groups of external experts: the AC/GPA and the Advisory Committee for Business and Operations. More information about the AC/GPA and its reports may be found at www.nsf.gov/about/performance/acgpa/index.jsp.

Quality

Quality is one of the three R&D Investment Criteria for agencies supporting research. Under this criterion, programs maximize the quality of the R&D they fund through the use of a clearly stated, defensible method for awarding a significant majority of their funding. For NSF, this method is the merit review process. In FY 2005, the percent of research funds that were allocated to projects that undergo external merit review was 90 percent.

The review infrastructure in place at NSF is expert-driven, of high quality, independent, and continual. The evaluation process is a true collaboration between the agency and the research and education community. Evaluations of individual proposals are based on criteria established by the National Science Board, and are conducted by reviewers selected from pools of national and international experts in each field. Each year NSF receives over 40,000 new proposals and subjects virtually all of them to an external merit review. In FY 2005, some 41,000 outside experts provided about 250,000 separate reviews to assist NSF in the evaluation of proposals, submitted to the Foundation's nine directorates and offices, covering a wide variety of topics.

The Quality criterion also requires programs to assess and report on the quality of current and past R&D. Independent evaluation of each of the agency's programs is also critical to ensuring that the focus of research investments continues to be at the frontier of science and engineering. For the past 27 years, NSF has convened external experts to analyze the wide range of programs throughout the Foundation. These Committees of Visitors (COVs) periodically review the managerial stewardship of a specific program or cluster of programs, compare plans with progress made, and evaluate outcomes to determine whether the research contributes to NSF mission and goals. The COVs also provide recommendations to NSF staff to guide future program directions.

Each COV report is presented to the respective directorate's Advisory Committee (AC) for approval. The AC is composed of scientists, engineers, and educators from academe, industry, and other government agencies. These committees work with NSF management to determine which research directions to pursue while assessing the quality and integrity of current program operations. The committees also provide context on how the results contribute to the agency's mission and strategic goals.

At the Foundation-wide level, performance evaluation is conducted by the Advisory Committee for GPRA Performance Assessment. The Committee meets annually to assess results for indicators associated with the strategic outcome goals of Ideas, Tools, and People, and the merit review indicator for the Organizational Excellence goal. The Committee also comments on the quality and relevance of award portfolios and on high risk/transformational research and education awards. The Committee's report is incorporated into the annual Performance and Accountability Report.

Program Assessment Rating Tool (PART)

NSF used the Program Assessment Rating Tool to assess two of its investment categories to inform the FY 2007 budget decision-making process. These PARTs assessed the Fundamental Science and Engineering investment category and the Federally Funded Research and Development Centers investment category. Both of these programs were rated “effective.” Since PART evaluations began, each of the ten NSF programs assessed has received the highest rating. The remaining three investment categories, Capability Enhancement, Centers, and Infrastructure and Instrumentation, will be assessed for and reported in the FY 2008 Budget Request.

Fundamental Science and Engineering (FSE), NSF’s largest investment category, comprises the broad, core set of research activities that ensure the vitality of a broad array of scientific and engineering fields needed for the United States to maintain leadership in science and engineering. FSE investments support the best new ideas generated by scientists and engineers working at the forefront of discovery. These investments are extremely important to invigorate the research community, since they promote emergence of new ideas and fields, especially in areas where disciplines are blurred, peer consensus is nascent, and new technologies emerge. Investments in these activities ensure the vitality of a broad array of scientific and engineering fields for the U.S. leadership in science and engineering.

Federally Funded Research and Development Centers (FFRDCs) support investments in research, development, and R&D policy that create unique, important, and long-term capabilities for the federal government in response to law, mandate, or widely recognized need. NSF’s FFRDCs are uniquely positioned to provide capabilities and state-of-the-art instrumentation to probe fundamental questions in science and/or to address pressing scientific and technological issues facing the Nation and the international community. The five centers designated as FFRDCs are the National Astronomy and Ionosphere Center, the National Center for Atmospheric Research, the National Optical Astronomy Observatory/National Solar Observatory, the National Radio Astronomy Observatory, and the Science and Technology Policy Institute.

Detailed PART results are available at www.whitehouse.gov/omb/budget/fy2006/. The schedule for PART activities is shown below.

Schedule for PART Activities

<u>Fiscal Year</u>	<u>Investment Category</u>	<u>Rating</u>
FY 2008:	Capability Enhancement (Ideas)	
	Centers (Ideas)	
	Infrastructure and Instrumentation (Tools)	
FY 2007:	Fundamental Science and Engineering (Ideas)	Effective
	Federally Funded Research and Development Centers (Tools)	Effective
FY 2006:	Biocomplexity in the Environment (Priority Area, Ideas)	Effective
	Institutions (People)	Effective
	Collaborations (People)	Effective
	Polar Tools, Facilities and Logistics (Tools)	Effective
FY 2005:	Nanoscale Science and Engineering (Priority Area, Ideas)	Effective
	Information Technology Research (Priority Area, Ideas)	Effective
	Individuals (People)	Effective
	Facilities (Tools)	Effective

Annual Performance Goals

NSF has developed several annual performance goals to measure its progress toward its strategic goals. The annual goals relate to time to decision, graduate students, broadening institutional participation, and facility efficiency. The first goal, time to decision, is a long-standing Foundation-wide goal. The annual performance goal is: *For 70 percent of proposals, be able to inform applicants whether their proposals have been declined or recommended for funding within six months of deadline or target date, or receipt date, whichever is later.* The chart below indicates results for FY 2002-2005 and targets for FY 2006 and FY 2007.

Time-to-Decision (NSF-Wide)	
FY 2002 Result	74%
FY 2003 Result	77%
FY 2004 Result	77%
FY 2005 Result	76%
FY 2006 Target	70%
FY 2007 Target	70%

Several of NSF's PART programs have adopted the time-to-decision goal for their individual programs. These PART goals include a quality component that is based on a review by the Advisory Committee for GPRA Performance Assessment. The chart below indicates results for FY 2002-2005 and targets for FY 2006 and FY 2007.

Time-to-Decision (by PART program)						
	Individuals	Institutions	Collaborations	Nanoscience Priority Area	Biocomplexity Priority Area	Fundamental Science and Engineering
FY 2002 Result	83%	74%	82%	78%	74%	74%
FY 2003 Result	84%	80%	92%	46%	83%	80%
FY 2004 Result	74%	83%	82%	46%	61%	83%
FY 2005 Result	78%	76%	82%	73%	66%	73%
FY 2006 Target	70%	70%	70%	70%	70%	70%
FY 2007 Target	70%	70%	70%	70%	70%	70%

The number of graduate students supported through NSF's three primary fellowship and traineeship programs is a key measure of the Agency's People goal. The annual performance goal is: *Maintain a high number of graduate students funded through fellowships or traineeships from Graduate Research Fellowships (GRF), Integrative Graduate Education and Research Traineeships (IGERT), or Graduate Teaching Fellowships (GK-12).* Funding at the FY 2007 request level will support an estimated 4,665 graduate students. The following chart indicates the results for FY 2002-2005 and the targets for FY 2006 and FY 2007.

Number of Graduate Students	
FY 2002 Result	3,623
FY 2003 Result	4,046
FY 2004 Result	4,628
FY 2005 Result	4,641
<i>FY 2006 Target*</i>	<i>4,525</i>
<i>FY 2007 Target</i>	<i>4,665</i>

* The FY 2006 number is revised from the FY 2006 Congressional Budget Request to report only graduate students directly funded. Previous results included all students participating in the GK-12 program.

Another annual performance measure, broadening institutional participation, has been adopted by several PART programs. NSF considers broadening institutional participation to be important in increasing the scope of ideas brought forward and that increasing the number of proposals from such institutions reaches a broader group of all researchers, including women and underrepresented minorities at the graduate, postdoctoral, and faculty levels. The annual performance goal for three of the PART programs is: *Increase or maintain the percentage of proposals received from academic institutions not in the top 100 of NSF funding recipients for the Institutions, Collaborations, and Fundamental Science and Engineering investment categories.* The chart below indicates results for FY 2002-2005 and targets for FY 2006 and FY 2007.

Broadening Participation Measure			
	Institutions	Collaborations	Fundamental Science and Engineering
FY 2002 Result	66%	62%	29%
FY 2003 Result	70%	61%	29%
FY 2004 Result	68%	61%	30%
FY 2005 Result	71%	49%	31%
<i>FY 2006 Target</i>	<i>73%</i>	<i>63%</i>	<i>31%</i>
<i>FY 2007 Target</i>	<i>73%</i>	<i>63%</i>	<i>31%</i>

Two annual performance goals are included for the Facilities PART program. These goals ensure that investments in development and construction of state-of-the-art facilities and platforms are implemented consistently with planned cost and schedule. The first goal, facility construction, is: *For ninety percent of construction, acquisition and upgrade projects, keep any negative cost and schedule variances to less than 10 percent of the approved project plan.* This goal applies to all ongoing projects and those to be completed in FY 2007 that have a total project cost of at least \$5.0 million. The following chart indicates results for FY 2002-2005 and targets for FY 2006 and FY 2007 for the Facility Construction goal.

Facility Construction	
FY 2002 Result	90%
FY 2003 Result	88%
FY 2004 Result	88%
FY 2005 Result	79%
<i>FY 2006 Target</i>	<i>90%</i>
<i>FY 2007 Target</i>	<i>90%</i>

The second goal, facility operations, is: *For ninety percent of operational facilities, keep scheduled operating time lost to less than 10 percent.* This goal applies to all NSF-supported Facilities that received greater than \$8 million in annual operations and maintenance support. The chart below indicates results for FY 2002-2005 and targets for FY 2006 and FY 2007 for the Facility Operations goal.

Facility Operations	
FY 2002 Result	84%
FY 2003 Result	87%
FY 2004 Result	89.70%
FY 2005 Result	100%
<i>FY 2006 Target</i>	<i>90%</i>
<i>FY 2007 Target</i>	<i>90%</i>