

FY 2022-2023 ANNUAL PERFORMANCE PLAN

This Annual Performance Plan is the first under NSF's FY 2022-2026 Strategic Plan *Leading the World in Discovery and Innovation, STEM Talent Development, and the Delivery of Benefits from Research*.¹ The Strategic Plan presents NSF's overall strategies for achieving each Strategic Goal and Objective. The FY 2022-2023 Annual Performance Plan includes additional targeted goals and contextual indicators to assess performance against the FY 2022-2026 Strategic Plan and describes supporting or related activities and evaluations.²

Alignment of Annual Goals and Contextual Indicators with the FY 2022-2026 Strategic Plan

Vision	A nation that leads the world in science and engineering research and innovation, to the benefit of all, without barriers to participation.			
Strategic Goals	Empower	Discover	Impact	Excel
Strategic Objectives	Ensure Accessibility and Inclusivity	Advance the Frontiers of Research	Deliver Benefits from Research	Strengthen at Speed and Scale
	Unleash STEM Talent for America	Enhance Research Capability	Lead Globally	Invest in People
Annual Goals	<ul style="list-style-type: none"> Annual Goal 1: Improve representation in the scientific enterprise (Agency Priority Goal) 	<ul style="list-style-type: none"> Annual Goal 2: Ensure that Major Facility Infrastructure Investments are on Track Annual Goal 3: Ensure that Mid-Scale Infrastructure Investments are on Track 	<ul style="list-style-type: none"> Annual Goal 4: Grow Partnerships 	<ul style="list-style-type: none"> Annual Goal 5: Provide robust and reliable IT services Annual Goal 6: Implement the Human Capital Operating Plan Annual Goal 7: Foster a Culture of Inclusion
Cross Cutting Annual Goals	<ul style="list-style-type: none"> Annual Goal 8: Make Timely Proposal Decisions Annual Goal 9: Ensure Key Program Investments are on Track (ARP Funding) 			
Contextual Indicators	Empower		Impact	
	<ul style="list-style-type: none"> NSF funding to Minority Serving Institutions 		<ul style="list-style-type: none"> Number and diversity of entrepreneurs participating in I-Corps™ Awards with international collaborations 	
	<ul style="list-style-type: none"> Ensure Key Program Investments are on Track (Budget Themes) 			

With the FY 2022-2023 Annual Performance Plan, NSF is expanding its view of performance to incorporate multiple types of evidence available at different timescales. This approach is informed by

¹ NSF's FY 2022-2026 Strategic Plan is available at https://www.nsf.gov/about/performance/strategic_plan.jsp.

² The FY 2021 Annual Performance Report, which reports on goals and targets under the prior strategic plan, is presented separately in this chapter; future Annual Performance Reports will be combined with the Annual Performance Plan.

external NSF advisory panels that have suggested a more holistic approach, as well as:

- the GPRA Modernization Act of 2010, which created new tools such as Agency Priority Goals and Strategic Reviews that enable agencies to think beyond annual output measures when designing performance targets; and
- the Evidence Act of 2019, which introduced a framework for types of evidence and placed performance monitoring as one of four components.

As described in the Framework section of this chapter, this Plan focuses on four categories of evidence that are designed to gauge NSF's progress against the goals and objectives in the agency's strategic plan:

- **Annual Goals:** the ongoing monitoring and reporting of quantitative measures with defined targets.
- **Contextual Indicators:** quantitative data that describes what we know about a particular program, organization, policy, or population. Contextual indicators do not include targets for expected outputs or outcomes
- **Evaluations:** systematic analysis of a program, policy, organization, or component of these to assess effectiveness and efficiency.
- **Policy and Program Analysis:** analyses of data to generate and inform policy and decision-making.

The table below further describes these evidence categories and highlights how they are reflected in the framework for assessing progress against NSF's strategic goals and objectives.

Evidence Types for Measuring NSF Performance

Annual Goals: ongoing monitoring and reporting of quantitative measures with defined targets.

- Annual Goals focus on questions about the progress the implemented approach is making toward objectives and goals, on key measures, and against set targets.

Examples of Annual Goals:

- Output measures such as Annual Goal 8, "Make Timely Proposal Decisions," and Annual Goal 2, "Ensure that Major Facility Infrastructure Investments are on Track."
- Quantitative elements and milestones related to information technology and human capital operating plans, such as those included in Annual Goals 5 and 6.

Contextual Indicators: quantitative data that describes what we know about a particular program, organization, policy, or population. Contextual indicators do not include targets for expected outputs or outcomes.

- Contextual Indicators are a valuable tool for foundational fact finding, and in this plan they enlighten our understanding of specific problems and challenges, target populations, and existing approaches to an area or issue of interest.

Examples of Contextual Indicators:

- NSF's Merit Review Reports, which include data on proposals and awards, including the number and funding rate for proposals, and demographic data on proposers and awardees, among other information on NSF's merit review process.³
- Reports and analyses developed by The National Center for Science and Engineering Statistics,

³ NSF's Merit Review Reports can be found at www.nsf.gov/nsb/publications/pubmeritreview.jsp

notably the biennial report, *Science and Engineering Indicators*, which includes data on the state of the U.S. science and engineering enterprise over time and within a global context.⁴

Evaluations: systematic analysis of a program, policy, organization, or component of these to assess effectiveness and efficiency.

- This category of evidence incorporates structured approaches, notably NSF's Learning Agenda and Annual Evaluation Plan. These activities seek to answer questions such as: to what degree is our implemented approach causing the desired outcomes/impact? How much effect? For whom? Under what conditions?

Examples of Activities

- Examples of evaluations may be found in the Annual Evaluation Plan, which lists topics for evaluation intended to answer questions identified by NSF.⁵ The Learning Agenda includes additional questions that may inform future evaluations.⁶
- The Learning Agenda includes *Guiding Questions* that apply to NSF's strategic goals and objectives, and these are highlighted throughout the APP.
- NSF's long-standing Committee of Visitors process, also applies to this category, as it assesses the quality and integrity of program operations.⁷

Policy and Program Analysis: analyses of data to generate and inform policy.

- In the context of this Annual Performance Plan, the Policy and Program Analysis category focuses on decision-making and on which approaches best address a given problem or challenge, given the available evidence.

Examples of Policy and Program Analysis

- Topical Reviews, a subset of Strategic Reviews that measure progress made toward Strategic Plan Goals and Objectives. Topical Reviews leverage cross-NSF teams to assess issues or problems and make recommendations for improvement.
- NSF reports progress made on Management Challenges identified by the Office of Inspector General (OIG) annually in the Agency Financial Report.⁸ Teams of NSF staff use root cause analyses, risk management assessments, and other tools to develop action plans and direct efforts in these areas.

The Annual Performance Plan includes illustrative examples of each type of evidence under each Strategic Goal description, as well as the *Guiding Question* from NSF's Learning Agenda, to provide context beyond our targeted performance goals. NSF's Learning Agenda contains a set of specific questions to help NSF assess progress on the strategic objectives listed under each Strategic Goal. The plan does not contain an exhaustive list of all activities and evaluations NSF will use to assess performance in advancing the goals and objectives of the Strategic Plan.

⁴ *Science and Engineering Indicators* may be accessed at <https://nces.nsf.gov/indicators>.

⁵ NSF's Annual Evaluation Plan for FY 2022 can be found at www.evaluation.gov/agencies/national-science-foundation under "Annual Evaluation Plan."

⁶ NSF's Learning Agenda is available at www.nsf.gov/od/oia/eac/products.jsp

⁷ Information on NSF Committee of Visitors reviews is available at www.nsf.gov/od/oia/activities/cov/

⁸ For more information on NSF's progress reports on OIG's Management Challenges, see Appendix 3 of the Agency Financial Report www.nsf.gov/pubs/2022/nsf22002/index.jsp

Strategic Goal 1, Empower

Empower STEM talent to fully participate in science and engineering

People are the core of America's scientific progress, and science and engineering are key to the nation's economic progress. To accelerate the advancement of discovery and learning, to prepare for a world in which work is increasingly reliant upon scientific and technological skills, and to ensure that all citizens share in the benefits that flow from research, we must promote inclusion in the research community and science, technology, engineering, and mathematics (STEM) workforce, access to STEM learning and training, and widespread STEM literacy.

Evidence Types for Strategic Goal 1, Empower

Annual Goal

- Annual Goal 1: Improve representation in the scientific enterprise **[Agency Priority Goal]**.

Contextual Indicator

- NSF funding to Minority Serving Institutions (MSIs)

Evaluations

The Learning Agenda Guiding Question that will inform NSF's evidence strategy for Goal 1 is: "How can NSF grow STEM talent and opportunities for all Americans most equitably?" Specific questions to be address through studies described in the Learning Agenda include:

- How can NSF help increase the participation of underrepresented groups in the STEM workforce? [planned evaluation]
- In what ways did the COVID pandemic influence the participation of different groups in the NSF portfolio of programs and activities? [planned evaluation]
- How can NSF help reduce and ultimately eliminate harassment in federally funded research settings? [planned evaluation]
- How could the data system developed for the Research Experiences for Undergraduates (REU) Sites program be leveraged to improve prospective monitoring of characteristics of participants in research experiences supported by other NSF programs and study the impact of research experiences on STEM outcomes, such as educational attainment? [planned evaluation]

Policy and Program Analysis

- Topical Strategic Review of the STEM workforce which highlighted important steps NSF has taken to address longstanding disparities throughout the STEM enterprise and recognized continued challenges, as identified in recent Executive Orders and the National Science Board's *Vision 2030* report.⁹ [FY 2021 activity]

⁹ Executive Order 13985, "Advancing Racial Equity and Support for Underserved Communities Through the Federal Government," may be viewed at www.federalregister.gov/documents/2021/01/25/2021-01-25-executive-order-13985-advancing-racial-equity-and-support-for-underserved-communities-through-the-federal-government.

- NSF's response to the OIG's Management Challenge, "Increasing Diversity in Science and Engineering Education and Employment."¹⁰ [FY 2021 and future activity]
- NSF is currently undertaking a pilot to improve its understanding of the demographics of principal investigators by requiring responses to demographic information questions on Research.gov; users have the ability to select "Do Not Wish to Provide" but may not opt out of answering.
- Analyses of data related to applications for, and participants in, the Research Experiences for Undergraduates (REU) program, including demographic, educational attainment, and attendance at a minority serving institution. These data will allow NSF to gauge its reach in providing opportunities across diverse populations.¹¹ [ongoing activity]

01753/advancing-racial-equity-and-support-for-underserved-communities-through-the-federal-government. Executive Order 14035, "Diversity, Equity, Inclusion, and Accessibility in the Federal Workforce," may be viewed at www.federalregister.gov/documents/2021/06/30/2021-14127/diversity-equity-inclusion-and-accessibility-in-the-federal-workforce. The National Science Board's *Vision 2030* report is available at www.nsf.gov/nsb/NSBActivities/vision-2030.jsp

¹⁰ For more information on OIG's Management Challenge and NSF's response, see the FY 2021 Agency Financial Report www.nsf.gov/pubs/2022/nsf22002/toc.jsp Appendices (OI)-40.

¹¹ More information on the REU program can be found at www.nsf.gov/crssprgm/reu/.

Strategic Objective 1.1 – Ensure accessibility and inclusivity. Increase involvement of communities underrepresented in STEM and enhance capacity throughout the nation.

Annual Goal 1: Improve representation in the scientific enterprise [Agency Priority Goal]

Goal Statement: Increase both the number and proportion of proposals received from underrepresented and underserved 1) investigators and 2) institutions.

Target and Results:

	FY 2021	FY 2022	FY 2023
Target	N/A	Establish baseline	Increase by 10 percent over baseline.
Result			

Among the awards NSF makes annually, the proportion of awards to investigators from underrepresented groups is not on par with their representation in the STEM workforce, which in turn is below the relative proportions of the total population. Internal analyses indicate that investigators from underrepresented groups do well in the merit review process, and that this gap originates at the application level—proposals submitted to NSF do not reflect the diversity of the STEM workforce (let alone the population as a whole). The aim of this APG is to improve representation in the scientific enterprise by pursuing actions that will lead to an increase in proposal submissions from underrepresented and underserved applicants and communities, including both individual principal investigators and institutions.

Data Collection and Reporting: Data for this goal will be collected through the various administrative systems of record used to manage the receipt of project proposals.

Strategic Objective 1.2 – Unleash STEM talent for America. Grow a diverse STEM workforce to advance the progress of science and technology.

Contextual Indicator: NSF funding to Minority Serving Institutions (MSIs)

Metric Definition: The number and total funding amounts of new awards funded to MSIs.

Historical Actuals/Results:

Indicator	Prior Year Results (Actuals) ¹²		
	FY 2019	FY 2020	FY 2021
Number of new awards funded to MSIs	1,510	1,606	1,719
Percent of all new NSF awards	13.4%	13.2%	15.1%
Total funding for new awards to MSIs (millions)	\$844	\$894	\$989
Percent of all new NSF funding (millions)	11.0%	11.5%	12.2%

MSIs are institutions of higher education enrolling populations with significant percentages of undergraduate minority students, or that serve certain populations of minority students under various programs created by Congress.¹³ Many underrepresented minority undergraduates are the first in their families to attend college, and minority-serving academic institutions enroll a substantial fraction of these students.¹⁴

MSIs make considerable contributions to educating and training science leaders, contributing to U.S. economic growth and competitiveness, but NSF usually receives comparatively few grant proposals from, or involving, scholars at MSIs. NSF’s FY 2023 Budget Request to Congress proposes a significant increase for investments in activities to grow the Nation’s research capacity within underserved communities and institutions, which includes the majority of MSIs. These investments will bolster ongoing efforts such as NSF INCLUDES and the Science of Broadening Participation,¹⁵ as well as the development of new initiatives such as Growing Research Access for Nationally Transformative Equity and Diversity (GRANTED). GRANTED aims to broaden the number and types of individuals who engage

¹² Results were generated using the MSI filter for the NSF by the Numbers dashboard as of February 8, 2022. The dashboard may be accessed at <https://tableau.external.nsf.gov/views/NSFbyNumbers/NumbersbyState>.

¹³ MSIs are defined under Part F of the Higher Education Act (20 U.S. Code § 1067q – “Investment in historically Black colleges and universities and other minority serving institutions”). For more information see: www2.ed.gov/about/offices/list/ocr/edlite-minorityinst.html.

¹⁴ National Center for Science and Engineering Statistics. 2021. Women, Minorities, and Persons with Disabilities in Science and Engineering: 2021. Special Report NSF 21-321. Alexandria, VA: National Science Foundation. <https://ncses.nsf.gov/pubs/nsf21321/report/field-of-degree-minorities#blacks-or-african-americans>

¹⁵ NSF INCLUDES (Inclusion across the Nation of Communities of Learners of Underrepresented Discoverers in Engineering and Science) is building the infrastructure for sustained broadening participation efforts across the Nation. The Science of Broadening Participation draws upon the theories, methods, and analytic techniques of the social, behavioral, economic, and learning sciences to better understand the factors that enhance as well as the barriers that hinder our ability to expand participation in education, the workforce, and major social institutions in society.

with NSF through listening sessions, research-coordination networks, research and implementation grants, partnerships with professional societies, and development of leadership in research administration.

Rationale for Contextual Indicator: NSF tracks and reviews the number of awards and funding provided to MSIs, as this portfolio is central to efforts to grow and sustain a diverse STEM workforce. Although the set of institutions identified as MSIs varies from year-to-year depending on which institutions meet the statutory criteria, it is a valuable contextual indicator for this strategic goal and objective.

Data Collection and Reporting: Data on NSF awards are captured in the administrative systems used to manage the award process, and publicly reported on an externally facing dashboard.¹⁶ The dashboard displays award and funding amounts for all years based on the list of MSI in use at the time the data are queried.

¹⁶ NSF by the Numbers Dashboard is available at <https://tableau.external.nsf.gov/views/NSFbyNumbers/NumbersbyState>

Strategic Goal 2, Discover

Create new knowledge about our universe, our world, and ourselves.

This goal furthers the NSF mission, “to promote the progress of science,” pursuing the generation of new knowledge so that the Nation remains a global leader in expanding discovery in science, engineering, and learning. By generating knowledge, NSF-funded researchers provide the Nation with the capability to maintain scientific, technological, and economic leadership in a competitive world.

Evidence Types for Strategic Goal 2, Discover

Annual Goals

- Annual Goal 2: Ensure that Major Facility Infrastructure Investments are on Track
- Annual Goal 3: Ensure that Mid-Scale Infrastructure Investments are on Track

Evaluations

The Learning Agenda Guiding Question that will inform NSF’s evidence strategy for Goal 2 is: “How can NSF fuel transformative discoveries most effectively?” Specific questions to be addressed through studies described in the Learning Agenda include:

- What are the characteristics of NSF’s portfolio on climate change, and to what extent might this portfolio advance NSF’s goals of equity, discovery, and impact? [planned evaluation]
- How do Established Program to Stimulate Competitive Research (EPSCoR) program funding strategies (infrastructure, co-funding, and outreach) contribute to increasing academic competitiveness across jurisdictions? [FY 2022 Evaluation Plan]

Policy and Program Analysis

- Process improvements in the major facilities portfolio to respond to various Government Accountability Office (GAO) and OIG reviews. Information on this work is summarized in NSF’s response to the FY 2021 OIG Management Challenge, “Providing Oversight of Major Multi-User Research Facilities.”¹⁷ [Ongoing]
- Response to OIG’s Management Challenge on, “Mitigating Threats Posed by Foreign Government Talent Recruitment Programs.”¹⁸ [Ongoing]

¹⁷ For the NSF response to OIG Management Challenge “Providing Oversight of Major Multi-User Research Facilities,” see appendix 3 of the FY 2021 Agency Financial Report www.nsf.gov/pubs/2022/nsf22002/index.jsp p. (OI)-21

¹⁸ For the NSF response to OIG Management Challenge on “Mitigating Threats Posed by Foreign Government Talent Recruitment Programs,” see appendix 3 of the FY 2021 Agency Financial Report www.nsf.gov/pubs/2022/nsf22002/index.jsp p. (OI)-47

[Strategic Objective 2.1 – Advance the frontiers of research. Accelerate discovery through strategic investments in ideas, people, and infrastructure.](#)

Annual Goal 2: Ensure that Major Facility Infrastructure Investments are on Track

Goal Statement: Ensure program integrity and responsible stewardship of major research facilities and infrastructure.

Targets and Results: The percentage of all Major Facility projects under construction that are over 10% complete for which negative cost and schedule variance are both at or below 10%.

	FY 2021	FY 2022	FY 2023
Target	100% of facilities with negative cost and schedule variance at or below 10%.	100% of facilities with negative cost and schedule variance at or below 10%.	100% of facilities with negative cost and schedule variance at or below 10%.
Result	Target not achieved. 3 of 5 projects were behind schedule as of 9/30/2021. All 5 facilities did meet the target of negative cost variance at or below 10%. ¹⁹		

Modern and effective research infrastructure is critical to maintaining U.S. international leadership in science and engineering. NSF’s major multi-user research facilities (major facilities) are transformative in nature, with the potential to shift the paradigm in scientific understanding. Key to realizing the benefits of new major facility investments is ensuring their timely completion within budgeted resources. At a general level, cost and schedule variances are key indicators of whether a project is on track relative to the project plan. Although cost and schedule variances are a direct measure of the recipient’s project management performance, NSF performs oversight activities that impact the measure results. The oversight activities serve to support the recipient’s project management and maintain recipient accountability. Therefore, the measure results provide an indication of the effectiveness of NSF’s oversight of major facility construction projects.

Data Collection and Reporting: Data for this goal are from the projects’ earned value management systems, which may lag one and a half to two months depending on the project. Data are delivered to NSF monthly and are summarized quarterly for internal reporting. Public reporting occurs annually with the release of the President’s Budget Request to Congress.

¹⁹ For a full discussion of the results, see the Annual Performance Report, later in this chapter.

[Strategic Objective 2.2 – Enhance research capability. Advance the state of the art in research practice.](#)

Annual Goal 3: Ensure that Mid-Scale Infrastructure Investments are on Track

Goal Statement: Ensure program integrity and responsible stewardship of mid-scale research infrastructure.

Targets and Results: Track cost and schedule performance during project implementation for Mid-Scale Research Infrastructure projects with a Total Project Cost above \$20.0 million that are over 10 percent complete and using Earned Value Management principles.

	FY 2021	FY 2022	FY 2023
Target	Track cost and schedule for all defined projects.	Track cost and schedule for all defined projects.	Track cost and schedule for all defined projects.
Result	Achieved.		

The Mid-Scale Research Infrastructure program is an NSF-wide effort to meet the research community’s needs for modern research infrastructure at a scale that is otherwise difficult for individual institutions to acquire. The program’s objectives are to transform scientific and engineering research fields with new infrastructure while simultaneously training early-career researchers in the development, design, construction, and use of cutting-edge infrastructure. Projects in this portfolio have costs that fall below the \$100 million threshold for a major facility project, but exceed \$4 million, so NSF oversight and tracking of performance measurements is crucial to ensuring stewardship of Federal funds.²⁰ Although the target for this goal reflects the relatively early stages of maturation for the Mid-Scale Research Infrastructure program, this goal serves as a marker of the importance the agency places on its stewardship responsibility, particularly for this new portfolio of investments.

Data Collection and Reporting: Reporting on this measure is provided in periodic progress reports, based on data from the projects’ earned value management systems, and reviewed by the NSF staff overseeing these projects.

²⁰ Although Mid-Scale Research Infrastructure projects begin at the threshold of \$4 million, this goal tracks those most likely to propose using Earned Value Management principles, with Total Project Costs of \$20 million or more.

Strategic Goal 3, Impact

Benefit society by translating knowledge into solutions.

NSF has always been at the forefront of scientific discovery and technological advancements improving society. Appropriately translated, NSF-supported contributions to knowledge promote U.S. leadership in topics of strategic national interest. These contributions are captured and disseminated in research papers in journals and conferences, patents, new approaches to education and training, as start-up enterprises, and in technology licenses. Through partnerships among academia, government, non-profits, industry, civil society, and communities of practice, the exchange of knowledge and resources helps shape a vibrant research agenda in which research questions are inspired by practical challenges, and stronger connections between researchers and potential users speed results.

Evidence Types for Strategic Goal 3, Impact

Annual Goal

- Annual Goal 4: Grow Partnerships

Contextual Indicator

- Number and diversity of entrepreneurs participating in I-Corps™
- Awards with international collaborations

Evaluations

The Learning Agenda Guiding Question that will inform NSF's evidence strategy for Goal 3 is: "How can NSF mobilize knowledge most effectively to impact society?" Specific questions to be address through studies described in the Learning Agenda include:

- In what ways does the Convergence Accelerator Innovation Training contribute to the emergence of new capacities among participating researchers to meet pressing societal needs? [FY 2022 Evaluation Plan]²¹
- What are the benefits of receiving an award from a program supported by a partnership? How do these differ from benefits associated with awards from programs not supported by a partnership? What outputs and outcomes are associated with partnership programs? To what extent can these be attributed to the partnership programs? What improvements could make partnership programs more effective or easier to implement? [FY 2022 Evaluation Plan]

²¹ More information on the Convergence Accelerator and its innovation curriculum can be found at <https://beta.nsf.gov/funding/initiatives/convergence-accelerator/program-model>

[Strategic Objective 3.1 – Deliver benefits from research. Advance research and accelerate innovation that addresses societal challenges.](#)

Annual Goal 4: Grow Partnerships

Goal Statement: Increase opportunities for public and private partnerships that will address major scientific and technological goals while ensuring broad societal benefits.

Targets and Results: Tracking and improving upon partnerships among NSF, our awardees and other entities is an area of growing interest for the agency. For this reason, we intend to establish a baseline for performance in FY 2022. NSF will establish a performance goal target in future Annual Performance Plans.

	FY 2021	FY 2022	FY 2023
Target	N/A	Establish baseline	Set target
Result			

This is a new goal to support the FY 2022-2026 Strategic Plan that builds on prior efforts including the FY 2020-2021 Agency Priority Goal, “Strategic Engagement in Partnerships,” which sought to enhance the impact of NSF’s investments through engaging in public and private partnerships, as well as the FY 2018-2019 Agency Priority Goal to, “Expand Public and Private Partnerships.” The culmination of these Agency Priority Goals was an NSF-wide partnerships strategy, including outreach, process improvement, and communications aspects.

This new iteration of the goal focuses on partnerships that are shaping research directions, cultivating co-design and co-creation of research-based solutions, and accelerating piloting, prototyping, and eventual translation of knowledge gained through NSF’s research portfolio to address society’s most pressing needs. For example, the FY 2023 Budget Request invests in programs needed to catalyze these types of partnerships, such as the NSF Regional Innovation Engines. The NSF Regional Innovation Engines program aims to incentivize partnerships that bring together multiple disciplines, institutions, and sectors, to include academia, industry, nonprofits, state and local governments, and venture capital, for the purpose of advancing use-inspired, solutions-oriented research.

Data Collection and Reporting: NSF will rely on administrative data resulting from the funding opportunity and award process.

Strategic Objective 3.1 – Deliver benefits from research. Advance research and accelerate innovation that addresses societal challenges.

Contextual Indicator: Number and diversity of entrepreneurs participating in I-Corps™

Metric Definition: This metric tracks the number of unique individuals trained through NSF’s Innovation Corps (I-Corps™) program, and the percentage of those trained who identified as being members of under-represented groups.²²

Results/Historical Actuals

Indicator	Prior Year Results (Actuals)	
	FY 2017-2018	FY 2019-2020
Total trained	1,628	1,928
Number (percentage) who identified as female	338 (21%)	411 (21%)
Number (percentage) who identified as a member of an underrepresented group	437 (27%)	568 (30%)

NSF I-Corps™ connects NSF-funded science and engineering research with the technological, entrepreneurial, and business communities, fostering a national innovation ecosystem that links scientific discovery with technology development, societal needs, and economic opportunities. Through I-Corps training, academic researchers can reduce the time needed to translate a promising idea from the laboratory to the marketplace or other relevant societal setting.

Rationale for Contextual Indicator: The I-Corps program is migrating to a new operational model based on expanded consortia, known as “Hubs,” to develop and nurture a National Innovation Network. This new model will help NSF continue to expand the ability to teach researchers customer discovery skills and facilitate technology applications for solutions that benefit the Nation. NSF awarded the first round of I-Corps Hubs awards in FY 2020, and we anticipate that following conclusion of those first awards, more data will be available to inform meaningful targets for participation.

Data Collection and Reporting: Data for this metric will be collected from the participant information included in project proposals, as reported in the Innovation Corps (I-Corps™) Biennial Report for 2021.²³

²² Under-represented groups include individuals who identify as 1) female, 2) race as Black or African American, American Indian, Alaska Native, and/or Native Hawaiian or other Pacific Islander, 3) of Hispanic origin, and/or 4) having a disability on their I-Corps project proposals.

²³ NSF I-Corps™ Biennial Report 2021 www.nsf.gov/news/special_reports/i-corps/pdf/NSFI-Corps2021BiennialReport.pdf

Strategic Objective 3.2 – Lead globally. Cultivate a global science and engineering community based on shared values and strategic cooperation.

Contextual Indicator: Awards with international collaborations

Metric Definition: Number of NSF awards that include collaborations with international partners.

Historical Actuals/Results:

Indicator	Prior Year Results (Actuals)		
	FY 2019	FY 2020	FY 2021
Actuals	1,368	1,330	1,398

The focus on international collaboration in science and engineering is based on discovery, learning, and research infrastructure to engage a diverse science community from different nations and cultural backgrounds. NSF develops international scientific collaborations on all seven continents and provides opportunities for researchers to enhance their work through international cooperation.

Rationale for Contextual Indicator: Monitoring the number of NSF awards that include international collaborations is only one of many ways the agency can gauge its reach and success in global leadership of science and engineering, though it is perhaps the most easily quantifiable. As efforts and strategies around this strategic objective mature, NSF will consider whether there are additional metrics that could be used to provide evidence of progress in this area.

Data Collection and Reporting: Data on international activities come from information collected on proposals at the time they are recommended for award. This metric monitors all proposals coded as “collaborative international activity” meaning that, for example, there was joint design or implementation of research, or foreign entities or personnel will be engaged in conducting the research. These data are updated and available on an ongoing basis.

Strategic Goal 4, Excel

Excel at NSF operations and management.

The first three strategic goals are associated with quickly evolving challenges. Meeting these and effectively fulfilling NSF's mission requires blending strong scientific leadership with robust organizational leadership. Both are characterized by vision and flexibility. NSF will reinforce its capacity to scale rapidly to advance an expanding portfolio that meets the growing need for breakthroughs in research and innovation.

Evidence Types for Strategic Goal 4, Excel

Annual Goals

- Annual Goal 5: Provide robust and reliable IT services
- Annual Goal 6: Implement the Human Capital Operating Plan
- Annual Goal 7: Foster a Culture of Inclusion

Evaluations

The Learning Agenda Guiding Question that will inform NSF's evidence strategy for Goal 4 is: "How can NSF excel at stewarding and realizing its vision?" Specific questions to be address through studies described in the Learning Agenda include:

- What are the characteristics of proposals evaluated through the merit review process? Are these characteristics (of individual investigators, teams, institutions, or proposed projects) associated with different review or funding outcomes? [planned evaluation]
- What outcomes are associated with the adoption of a no-deadlines proposal submission process? [planned evaluation]

Policy and Program Analysis

- Response to OIG's Management Challenge on, "Providing Oversight of Grants During a Pandemic."²⁴ [FY 2021 activity. Future activity on "Overseeing Grants in a Changing Environment"]
- Response to OIG Management Challenge, "Managing the Intergovernmental Personnel Act (IPA) Program."²⁵

²⁴ For the NSF response to OIG Management Challenge on, "Providing Oversight of Grants During a Pandemic," see appendix 3 of the FY 2021 Agency Financial Report www.nsf.gov/pubs/2022/nsf22002/index.jsp p. (OI)-26

²⁵ For the NSF response to the OIG Management Challenge on, "Managing the Intergovernmental Personnel Act (IPA) Program," see appendix 3 of the FY 2021 Agency Financial Report www.nsf.gov/pubs/2022/nsf22002/index.jsp, p. (OI)-31

Strategic Objective 4.1 – Strengthen at speed and scale. Pursue innovative strategies to strengthen and expand the agency’s capacity and capabilities.

Annual Goal 5: Provide robust and reliable IT services

Goal Statement: Ensure availability of IT resources for NSF staff and the broader research community.

Targets and Results: NSF IT systems will be available 99.6 percent of the time, excluding 469 hours of planned downtime.

	FY 2021	FY 2022	FY 2023
Target	99.6%	99.6%	99.6%
Result	Achieved. Result = 99.8%		

NSF prioritizes availability of IT services, and coordinates downtime for critical maintenance and service releases to minimize disruption. This goal supports the President’s Management Agenda pillars of “Strengthening and empowering the Federal workforce,” and, “Delivering excellent, equitable, and secure Federal services and customer experience,” by ensuring that critical information and IT systems are available to support staff and our awardees in their pursuit of NSF’s mission.

Data Collection and Reporting: IT system availability is monitored daily. This is appropriate as availability issues need to be addressed quickly and therefore current data are required. For Annual Goal 5, data are updated monthly and reported to the Division of Information Systems.

[Strategic Objective 4.2 – Invest in people. Attract, empower, and retain a talented and diverse NSF workforce.](#)

Annual Goal 6: Implement the Human Capital Operating Plan

Goal Statement: Track progress against NSF’s Human Capital Operating Plan

Targets and Results: Targets will be determined in the first quarter of each fiscal year, based on the forthcoming Human Capital Operating Plan.

	FY 2021	FY 2022	FY 2023
Target	N/A	Submit draft FY 2022-2025 Human Capital Operating Plan to OPM.	To be determined following finalization of the FY 2022-2025 Human Capital Operating Plan.
Result			

NSF’s Division of Human Resource Management prepares the NSF Human Capital Operating Plan, which outlines the agency’s human capital strategies and actions that enable accomplishment of NSF’s mission, its strategic plan, and its performance goals. The Human Capital Operating Plan is a tactical, dynamic plan that identifies the specific, near-term actions NSF will take to achieve the agency’s human capital goals. It is a four-year plan updated regularly to reflect changes in the human capital strategies and actions needed to ensure the plan’s continuous alignment with agency priorities. In FY 2022, NSF will finalize the Human Capital Operating Plan for FY 2022-2025. The human capital strategies and actions included in the plan will serve as the basis for evaluating progress on this goal.

Strategic Objective 4.2 – Invest in people. Attract, empower, and retain a talented and diverse NSF workforce.

Annual Goal 7: Foster a Culture of Inclusion

Goal Statement: Foster a culture of inclusion through change management efforts resulting in change leadership and accountability.

Targets and Results:

	FY 2021	FY 2022	FY 2023
Target	All NSF leaders will participate in culture change activities.	Increase agency-wide engagement in Special Emphasis Program observances and Diversity and Inclusion-related activities by 10% from 2021.	To be determined. Pending finalization of NSF’s Diversity, Equity, Inclusion, and Accessibility Strategic Plan.
Result	Achieved. Result = 100%		

NSF values diversity and recognizes that a culture of inclusion is a critical driver in achieving our scientific mission. Fostering inclusive work environments and realizing the full potential of the workforce's diversity requires the implementation of thoughtful strategies focused on creating meaningful, sustainable, and measurable change. This holistic approach to diversity and inclusion is supported by Executive Order 14035, "Diversity, Equity, Inclusion, and Accessibility (DEIA) in the Federal Workplace," which requires that federal agencies develop DEIA Strategic Plans, and to regularly measure and report on the effectiveness of DEIA initiatives.²⁶ NSF’s FY 2023 target will be directly related to the NSF DEIA Strategic Plan, which is currently under development.

NSF’s FY 2022 target is focused on involving all of NSF’s workforce in cultivating a healthy, inclusive workplace environment. The Office of Equity and Civil Rights, through the development of NSF’s DEIA Strategic Plan, an expanded Diversity & Inclusion portfolio, and strong partnerships with all of NSF’s Directorates and Offices, aims to increase agency-wide engagement in Special Emphasis Program observances, Employee Resource Groups, and other diversity and inclusion-related activities by 10 percent from 2021.

Data Collection and Reporting: Data for the FY 2022 target will be collected from Employee Resource Group membership rosters and event and activity participation logs.

²⁶ Executive Order 14035, "Diversity, Equity, Inclusion, and Accessibility in the Federal Workplace" www.federalregister.gov/documents/2021/06/30/2021-14127/diversity-equity-inclusion-and-accessibility-in-the-federal-workforce

Cross-cutting Areas

Annual Goals 8 and 9 are crosscutting in nature – supporting both the programmatic strategic objectives of NSF as well as the agency’s aim to excel at operations and management of those programs.

Evidence Types for Cross-cutting Areas

Annual Goals

- Annual Goal 8: Make Timely Proposal Decisions
- Annual Goal 9: Ensure Key Program Investments are on Track (ARP Funding)

Contextual Indicator

- Ensure Key Program Investments are on Track (Budget Themes)

Evaluations

- What are the characteristics of NSF’s portfolio on climate change, and to what extent might this portfolio advance NSF’s goals of equity, discovery, and impact? [planned evaluation]

Policy and Program Analysis

- Proposal review quality. NSF previously reported on a goal to “Improve Review Quality” and although that goal has been retired in this version of the Annual Performance Plan, the work to improve review quality based on customer service feedback continues through activities that build upon the pilot efforts undertaken in FY 2021. [ongoing activity]

Cross-cutting Areas

Annual Goal 8: Make Timely Proposal Decisions

Goal Statement: Inform applicants whether their proposals have been declined or recommended for funding within 182 days, or six months, of deadline, target, or receipt date, whichever is later.

Target and Results: The target reflects the percent of proposals for which a funding decision is communicated to the principal investigator for the proposal within 6 months of receipt.

	FY 2021	FY 2022	FY 2023
Target	75%	75%	75%
Result	65%		

Time to decision or “dwell time” is the amount of time that passes between receipt of a proposal and notification to the principal investigator about the funding decision. At the time of this goal’s establishment in the early 2000s, one of the most significant issues raised in customer satisfaction surveys was the time it took NSF to process proposals, with only around 50 percent of proposals receiving responses within 6 months of submission or deadline. Too long a time period inhibits the progress of research as it delays the funding process, but too short a time period may inhibit review quality. The 75 percent target seeks to strike a balance between the need of the principal investigators for timely action, the need of NSF for a credible and efficient merit review system and postponing the finalization of some award or decline decisions until final appropriations and approval of NSF’s operating plan have been received for the fiscal year. Since this goal was introduced, NSF’s response times have improved, and over 70 percent of proposals have received responses in under 6 months for much of the past two decades. NSF did not meet the target in FY 2021, due in part to prioritizing response to the pandemic among existing awardees and the activities required to plan, allocate, and distribute the relief funding made available through the American Rescue Plan.²⁷

Data Collection and Reporting: Data for this goal are extracted from the NSF Enterprise Information System based on various systems that record date of proposal receipt and dates of funding decisions.

²⁷ The American Rescue Plan Act of 2021 (P.L. 117-2) provided \$600 million for NSF to fund grants, scholarships, cooperative agreements, and other activities to respond to COVID-19.

Cross-cutting Areas

Annual Goal 9: Ensure Key Program Investments are on Track (ARP Funding)

Goal Statement: Ensure that key FY 2023 NSF-wide program investments are implemented and on track.

Targets and Results: Targets for this goal are developed on an annual basis to align with funding priorities of the year. In FY 2022, NSF will track obligations of remaining American Rescue Plan funding.

	FY 2021	FY 2022	FY 2023
Target	NSF will obligate 100 percent of designated funding targets for all identified NSF-wide priority investments.	NSF will obligate 100 percent of designated funding targets for all identified NSF-wide priority investments.	TBD
Result	Achieved.		

This measure looks at the extent to which NSF is able to meet its annual funding targets for key NSF-wide investments. The percentage of the annual targeted funding that is obligated by the end of the year is an indication of NSF's effectiveness in moving through the program investment process and ensuring that key investments are implemented and on track.

Contextual Indicator: Ensure Key Program Investments are on Track (Budget Themes)

Metric Definition: NSF will track obligations against key areas of focus in the budget (budget themes).

Historical Actuals/Results: These themes will be confirmed and tracked beginning in FY 2023.

The FY 2023 Budget Request to Congress proposes investments in several key areas of interest to NSF and the Administration, such as "emerging industries" and "research infrastructure." This measure looks at the extent to which NSF is able to meet its annual funding targets for key NSF-wide investments. The percentage of the annual targeted funding that is obligated by the end of the year is an indication of NSF's effectiveness in moving through the program investment process and ensuring that key investments are implemented and on track.

Data Collection and Reporting: Data for this goal are gathered from various systems of record, including the NSF financial system for funding amounts.

Retired measures

In the process of developing an Annual Performance Plan to align with the FY 2022-2026 Strategic Plan's goals and objectives, several goals reported under the prior Strategic Plan are being retired or modified to focus attention and efforts on new strategic priorities within these programmatic and operational areas. Historical information, including the FY 2021 results for these goals can be found in the Annual Performance Report later in this chapter. The retired goals include:

- **Strategic Engagement in Partnerships:** Strategically engage in public and private partnerships to enhance the impact of NSF's investments and contribute to American economic competitiveness and security. (Agency Priority Goal for FY 2020-21). This has been replaced by Annual Goal 4. "Grow Partnerships" in this Annual Performance Plan.
- **Improve Review Quality:** Improve the quality of written reviews of NSF proposals.
- **Align Job Requirements with Competencies:** Ensure that employee job requirements are aligned with competencies and skills needed for the future. NSF will focus efforts on implementation of its FY 2022-2025 Human Capital Operating Plan under Annual Goal 6 of this plan.
- **Improve User Interactions with IT Systems:** Streamline and simplify user interactions with IT systems and functions that support the merit review process, reducing non-value-added steps and reducing the time spent managing the proposal and award lifecycle. NSF will retire the portions of this goal associated with consolidating interfaces to a single portal, due to reprioritization of IT resources. NSF will continue to report on IT system availability.

