

INFORMATION TECHNOLOGY (IT)**\$166,830,000**

NSF's FY 2024 Request for IT investments total \$166.83 million. Funding for NSF's IT investment is provided from the AOAM, R&RA, and EDU accounts.

NSF IT Portfolio Investments by Appropriation**IT Investments by Appropriation**

(Dollars in Millions)

	FY 2022 Actual	FY 2023 Estimate	FY 2024 Request	Change over		Funding Source
				FY 2023 Estimate Amount	Percent	
AOAM IT	\$32.15	\$38.53	\$39.42	\$0.89	2.3%	AOAM
Program Related Technology (PRT)	111.19	108.72	127.41	18.69	17.2%	R&RA/EHR
Total	\$143.34	\$147.25	\$166.83	\$19.58	13.3%	
Total AOAM	32.15	38.53	39.42	0.89	2.3%	
Total R&RA	94.32	93.08	109.05	15.97	17.2%	
Total EDU	16.87	15.64	18.36	2.72	17.4%	

Agency IT investments funded through the AOAM account support the agency's operations to ensure high quality, reliable, and secure administrative applications and associated IT infrastructure support and services to meet the needs of the Foundation. This funding accounts for almost one quarter (24 percent) of NSF's total IT investment in the FY 2024 Request.

Program Related Technology (PRT) investments support NSF's programmatic activities and associated services and are funded through the R&RA and EDU accounts. PRT investments are mission-related IT and Data Management investments that support the merit review process, including pre-award planning and activities; receipt of proposals; processing proposals; reviewing proposals; award decisions, documentation, and notification; funding awards; post-award oversight; dissemination of award results; and award close-out. PRT investments account for just over three quarters (76 percent) of NSF's FY 2024 total funding for IT investments.

NSF's IT priorities for FY 2024 reflect the Foundation's commitment to providing excellent, equitable, and secure Federal services and customer experiences, while continuing to enhance Federal IT and cybersecurity as key enablers of mission delivery.

In FY 2024, NSF will preserve secure, reliable information technology operations and ongoing modernization of the agency's IT infrastructure and systems that support the business operations of the agency, while enabling innovation and new modernization to support NSF's strategic objectives. Advances supported by this submission include IT initiatives to: (1) Strengthen Established NSF, supporting the Foundation in expanding the frontiers of knowledge and technology; (2) Enable Participation by the "Missing Millions" to bring new, diverse perspectives into the Nation's scientific enterprise; (3) Accelerate Technology and Innovation at speed and scale; (4) Promote a Hybrid and Equitable Workforce, reducing administrative burden and ensuring equity through optimized support; and (5) Enable Data-driven Decision Making, augmenting IT services with intelligence using predictive and prescriptive technologies.

Information Technology

Within the FY 2024 Request, while much of the cost increase (\$10.0 million or 36 percent) is driven by inflation, incremental development, new modernization, and innovation will continue based on the aforementioned priorities, including:

- Employ innovative and emerging technology capabilities to accelerate discovery and strengthen state-of-the art research, enabling NSF to increase agility of merit review and administrative functions while strengthening and empowering the agency's workforce and providing platforms for development and testing of new technology tools and capabilities;
- Continue technology transformations geared toward broadening participation, improving the customer experience, and increasing engagement both internally and for public-facing digital services, with a continued focus on modernization and digitization;
- Increase investment in technologies that enable NSF to enhance and evolve processes and to operate at speed and scale, such as utilizing technology to eliminate manual processes and improve integration between human resource management systems, and modernizing agency financial management capabilities to support budget formulation and acquisition management;
- Maintain and expand the agency's flexible and scalable IT infrastructure and systems, including technologies to support remote work, providing advanced technology capabilities to reduce administrative burden and facilitate information sharing to ensure equity while preserving secure, reliable operations; and
- Enable and enhance NSF's capabilities for data-driven decision making, building, and maturing a unified data ecosystem that leverages next generation analytics and artificial intelligence (AI).

NSF IT Portfolio Investments by Category

Investments in NSF's IT Portfolio can be grouped across five main categories: Administrative Applications Services and Support; Mission-Related Applications and Services; IT Operations and Infrastructure; IT Security and Privacy; and IT Management. Funding for the activities under these investment categories is split between AOAM and PRT.

Information Technology Portfolio by Category

(Dollars in Millions)

	FY 2022 Actual	FY 2023 Estimate	FY 2024 Request	Change over FY 2023 Estimate		Funding Source
				Amount	Percent	
Administrative Applications Services and Support	\$8.24	\$11.61	\$9.98	-\$1.63	-14.0%	AOAM
Mission-Related Applications and Services	72.68	67.91	83.42	15.51	22.8%	PRT
IT Operations and Infrastructure	48.93	52.16	57.85	5.69	10.9%	AOAM/PRT
Security and Privacy Services	10.86	12.67	12.60	-0.07	-0.6%	AOAM/PRT
IT Management	2.63	2.90	2.98	0.08	2.8%	AOAM/PRT
Total	\$143.34	\$147.25	\$166.83	\$19.58	13.3%	

Administrative Applications Services and Support (\$9.98 million; AOAM only)

Investments in this category support administrative applications, such as the NSF website, NSF's human resources management systems, and NSF's financial management system.

- iTRAK is NSF's financial management system. Seventy percent will be funded by PRT through the R&RA and EDU accounts and 30 percent will be funded by the AOAM account. The AOAM portion of the FY 2024 funding supports ongoing operations and maintenance of the system as well as routine technical refresh.

- Other administrative applications services which provide for operations and maintenance of agency administrative and collaboration tools, such as the NSF website. FY 2024 funding in this area will support operations and maintenance of NSF.gov.
- Continued operations and maintenance of the systems that support strategic management of NSF human capital, including those that enable the effective recruitment, retention, reskilling, and rewarding of NSF staff in alignment with NSF's Strategic Objective 4.2: Invest in People.¹ Funding in FY 2024 will support operations for the agency's core human capital management systems, including new human resource management assessment capabilities, as the agency continues expanding services to accommodate the workforce.

Mission-Related Applications and Services (\$83.42 million; PRT only)

Investments in this category fund the applications and services that support the merit review process, including pre-proposal planning; receipt of proposals; processing proposals; reviewing proposals; award decisions, documentation, and notification; funding awards; post-award oversight; dissemination of award results; and award close-out. These investments can be classified as:

- Mission Support Systems, which include support for a wide range of activities:
 - Operations and maintenance of NSF's mission support systems, which provide a suite of functionality supporting each stage in the NSF proposal and award management process. Work in this area incorporates ongoing needs for new functionality as it is incrementally deployed for production use.
 - Continuous modernization of systems and services that support the merit review process. FY 2024 efforts will continue to prioritize modernization of public-facing digital services with NSF's primary focus on the services listed towards the end of this narrative in the *Prioritized Services and Forms Identified for Modernization and Digitization* section.
 - Web Modernization: Continues efforts to expand the capabilities and information shared through NSF's website, which provides the general public, science and engineering research communities, and education communities with access to high quality information and services. In FY 2024, NSF will continue agile development of NSF.gov with features and content to better serve all audiences, continue modernization of the agency's intranet site using human centered design principles and promote a suite of digital platform tools and services to support and enhance customer experience.
 - Public Access: Supports continued use of the NSF Public Access Repository (NSF-PAR) as a controlled platform for integration with third-party services, leveraging application programming interfaces that support machine-to-machine communication to enhance public access to high-quality Federal data and reduce burden on the research community. FY 2024 efforts continue system updates that enhance access to research outputs within the federated cross-agency repository.
 - Intelligent Automation of Grants Management Systems: This investment provides for incremental development and new modernization of IT systems/applications that support NSF's evolving grants management lifecycle. Investments aligned to this initiative in FY 2024 will focus on improvements to enhance non-financial aspects of the merit review process, including continued efforts to consolidate researcher profiles; enhance functions related to meeting support, reviewer management, and proposal clearance and

¹ Leading the World in Discovery; and Innovation; STEM Talent Development; Delivery of Benefits from Research - NSF Strategic Plan for Fiscal Years (FY) 2022 - 2026 | NSF - National Science Foundation
<https://www.nsf.gov/pubs/2022/nsf22068/nsf22068.pdf>

publication; and modernize agency capabilities to electronically manage and process proposals.

- **Improve Service Delivery:** In FY 2024 this initiative will continue focusing on new and improved tools to enhance IT service delivery, such as strengthened infrastructure and tools that support hybrid work and improved collaboration.
- **Interactive Panel Systems (IPS) Replacement:** In FY 2023, NSF is expected to complete modernization of the interactive panel system, used by reviewers to collaborate with fellow panelists and review, rank, and recommend proposals; FY 2024 funding will transition to operations and maintenance support of the new IPS.
- **Innovation Management:** Continues the adoption and implementation of advanced tools and technologies to promote innovation, research and development, and emerging technologies to support agency priorities. Specifically, FY 2024 funding will continue efforts to expand the discovery, development, and use of citizen-developed technology and advanced capabilities such as AI, robotic process engineering (RPA), machine learning, and low-code/no-code technologies.
- **NSF's Data Management and Delivery investment:** NSF has prioritized agency initiatives to build a data fabric and improve access to Federal data assets and strengthen data infrastructure, further supporting the agency's use of data and evidence. FY 2024 funding includes continued investments in infrastructure, services, and systems that accelerate access to secured, real-time, well-documented enterprise data, enabling agency staff to leverage data and analytics to achieve NSF's mission. In addition, ongoing support is provided for data governance and upskilling the workforce through knowledge sharing and training in data literacy and data analytics. In FY 2024, key priorities in this area include expanded use of cutting-edge technologies and capabilities for advanced analytics, such as AI/machine learning, clustering, and text analytics.
- **Support for NSF's core financial system, iTRAK:** As noted above 70 percent of this request is funded by PRT with the remaining 30 percent funded by AOAM under Administrative Applications Services and Support. In FY 2024, the PRT support for iTRAK will enable NSF to begin planning for the next generation agency financial system.
- **Financial services support:** Enables continued agency efforts to modernize, streamline, and achieve higher efficiencies in NSF's core business and operations systems to improve transparency and accuracy of reporting between iTRAK and other mission systems that support agency awards, budget, contracting, oversight, and financial reporting functions. In FY 2024, NSF will continue account code modernization, invest in new capabilities to support budget and contract functions, and continue enhancements to core business and operations systems, focusing on account management, cost sharing, and award closeout functions.
- **Human Resource System Modernization:** This is an ongoing investment to modernize and enhance core agency systems for strategic management of human capital and administrative resource management. In FY 2024, NSF will prioritize capabilities for talent management, including the use of electronic assessment tools that will support agency efforts to close skill gaps.

IT Operations and Infrastructure (\$57.85 million; \$23.19 million AOAM and \$34.66 million PRT)

The FY 2024 Request funding will support NSF's ongoing enhancements to agency capabilities related to network, infrastructure, data center, customer support, and database administration. Specifically, the investments in this category are classified as:

- **Network:** Provides access to administrative applications, services, and technologies for virtual collaboration via a single network with wired and Wi-Fi connectivity for NSF staff and visitors. FY 2024 funding supports continuous implementation of Zero Trust, modernization of NSF's

infrastructure, network, and telecommunications, including costs associated with the agency's continued adoption of Internet Protocol Version 6 (IPv6) technologies, as well as voice services via NSF's modernized voice over internet protocol (VoIP) solution and other telecommunications requirements delivered through the federal Enterprise Infrastructure Services (EIS) contract.

- Data Center and Cloud: Continues the agency use of cloud services and technologies, including the use of cloud-based email and collaboration tools, to enable further reductions in NSF's data center footprint as the agency continues to expand cloud services adoption. FY 2024 funding will support accelerated adoption and use of secure cloud infrastructure and services, including cloud migrations to modernize legacy systems and infrastructure utilizing Zero Trust Architecture principles, as well as activities to increase resilience of IT services and applications, improve speed of deployment, and support NSF's service recovery capability. Support for Data Center Facilities and Power is not included in the AOAM IT or PRT budgets discussed in this narrative but is included in the agency's IT Portfolio summary reporting and mentioned here for transparency. Funding for Data Center Facilities and Power is supported under Space Rental and referenced in the Space Rental narrative.
- End User: Provides help desk services and customer care support for internal users (NSF staff) and external users (the research community including institutions, principal investigators, reviewers, and NSF visitors), as well as support for agency-provided workstations, mobile devices, and peripherals. FY 2024 funding in this area supports continuing improvements to service delivery, including the expansion of self-help technology capabilities to improve customer experience and support NSF staff and customers who are working remotely, as well as ongoing modernization of services and devices.
- Platform: Reflects NSF's use, management, and acquisition of hyper-converged hardware, software, and services. In FY 2024, NSF will continue efforts to modernize database platforms.
- Output: Supports NSF's Print Center services. These costs are not part of the AOAM IT or PRT budget discussed in this narrative but are included in the agency's IT Portfolio summary reporting and mentioned here for transparency. Funding for Print Center services are supported under Building and Administrative Services and discussed further in that section of the Administrative Support narrative.

Security and Privacy Services (\$12.60 million; \$5.63 million AOAM, \$6.97 million PRT)

Investments in this category support the portion of NSF's IT security program which provides security and compliance oversight for NSF's administrative applications and mission support systems under the direction of the NSF Chief Information Security Officer (CISO). The FY 2024 level prioritizes preservation of secure, reliable operations, including maintenance of the agency's Security Operations Center (SOC) capability providing 24/7/365 security monitoring, detection, and response capabilities; maintains support for IT operations related to NSF's Sensitive Compartmented Information Facility (SCIF) in the Alexandria facility; and prioritizes NSF's continued efforts to accelerate adoption and use of secure cloud infrastructure and services, leveraging Zero Trust Architecture. This funding level also enables NSF to continue current approaches to manage, modernize, and secure agency information, including efforts to manage supply chain risks, maintain cybersecurity vulnerability and incident response capabilities, and continue maturing capabilities to protect agency information, endpoints, and enterprise identity management solutions. In FY 2024, NSF will maintain investments in staff, tools, and professional services to support the Foundation's hybrid workforce with modern and secure capabilities and to maintain secure, reliable operations and around-the clock security monitoring. The investment includes: shared service offerings from the Department of Homeland Security (DHS) Continuous Diagnostics and Mitigation (CDM) to supplement agency monitoring

capabilities; automated configuration management tools that manage security patches and provide proactive protection from viruses, spyware, and other threats; application security; security control testing and tools; vulnerability management activities, including activities related to assessment, management, and disclosure; remediation and intrusion detection services; and activities related to cybersecurity assessment and authorization, including supply chain risk management.

Because cybersecurity is a main component of many IT investments, a significant portion of NSF's cybersecurity costs is inherently built into each component investment and thus included in that component's investment category as opposed to reported under Security and Privacy Services. In addition, as part of its mission to fund basic scientific research, NSF awards grants to the scientific community for cybersecurity research and development. Cybersecurity investments are also embedded within NSF's research support and logistics for the U.S. Antarctic Program funded through the Office of Polar Programs. These grants and the investments made through the U.S. Antarctic Program are outside of NSF's IT portfolio funded via the AOAM account and PRT. To see NSF's total Cybersecurity investments according to the National Institute of Standards and Technology categories (Identify, Protect, Detect, Respond, and Recover), please see the *NSF's Total Cybersecurity Investments* section below.

IT Management (\$2.98 million; \$620,000 AOAM, \$2.36 million PRT)

IT Management includes support for the Chief Information Officer, Chief Data Officer, Senior Agency Official for Privacy, and senior IT leadership in the areas of IT strategy and planning, enterprise architecture, capital planning, vendor management, IT budget/finance, IT strategic communications, and support for policy and reporting efforts related to Federal IT, including compliance with the Federal Information Technology Acquisition Reform Act (FITARA). In FY 2024, investments in this category will enable NSF to continue implementation of the Technology Business Modernization (TBM) framework, further enhancing the agency's ability to manage IT as a business.

Individual Directorate/Office IT Costs Outside of NSF's Central IT Budget

With increased availability of IT tools and solutions, NSF's investment in non-central ("distributed") IT continues to grow. In an effort to increase transparency and show continuous improvement in NSF's reporting and understanding of its IT expenditures, NSF's Chief Information Officer is working to formalize reporting and governance of distributed IT investments at NSF that are funded outside of the central IT budget (AOAM IT and PRT) discussed above. Currently, NSF has identified about \$5.36 million of distributed IT costs that are being actively tracked and are included in the FY 2024 IT Portfolio summary reporting.

NSF Funding for E-Government Initiatives

The tables below show NSF's contributions and service fees for various E-Government and Line of Business (LoB) initiatives. These costs are not part of the AOAM IT or PRT budget discussed in this narrative but are included in the agency's IT Portfolio summary reporting and mentioned here for transparency. Both the FY 2023 and FY 2024 levels are consistent with the funding amounts provided to NSF by the initiatives' respective managing partners.

NSF FY 2023 Request Funding for E-Government and Line of Business (LoB) Initiatives

Initiative	NSF Total	Appropriations Account	
		AOAM	R&RA
Grants.gov	\$325,000	-	\$325,000
Geospatial LoB	25,000	-	25,000
E-Rulemaking	23,474	23,474	-
Federal Audit Clearing House	89,424	-	89,424
Integrated Acquisition Environment (IAE)	719,644	21,000	698,644
Human Resources Management LoB	68,478	-	68,478
Financial Management LoB	139,094	-	139,094
Budget Formulation/Execution LoB	120,000	-	120,000
Total	\$1,510,114	\$44,474	\$1,465,640

NSF FY 2024 Request Funding for E-Government and Line of Business (LoB) Initiatives

Initiative	NSF Total	Appropriations Account	
		AOAM	R&RA
Grants.gov	\$322,000	-	\$322,000
Geospatial LoB	25,000	-	25,000
E-Rulemaking	17,017	17,017	-
Federal Audit Clearing House	93,627	-	93,627
Integrated Acquisition Environment (IAE)	649,723	21,000	628,723
Human Resources Management LoB	68,478	-	68,478
Financial Management LoB	139,094	-	139,094
Budget Formulation/Execution LoB	120,000	-	120,000
Total	\$1,434,939	\$38,017	\$1,396,922

Prioritized Services and Forms Identified for Modernization and Digitization

Service/Form Name	Brief description
NSF website modernization	<p>The Foundation's main public-facing website, NSF.gov, delivers news and information to the public regarding research, funding, and awards. NSF continues to move to a modern website platform (beta.nsf.gov) to further enhance customer interactions and create a content-rich experience for users. Upcoming modernization efforts include:</p> <ul style="list-style-type: none">• Improvements to the "Funding" and "Awards" sections of the site that make it easier for users to find high-priority information.• A new and improved "About NSF" section of the site.• Updated navigation, with a universal header and footer. A new homepage for the NSF website, built using the beta site's modernized design system.• Rebranding of the beta.nsf.gov site to new.nsf.gov. <p>This service is covered in the Web Modernization investment.</p>
Research.gov	<p>NSF's Research.gov system is the principal tool used by individuals and institutions to make grant proposals to NSF, receive grant awards, and comply with the terms of those grant awards. In FY 2023, NSF completed the move of Proposal Preparation and Submission capabilities from FastLane to Research.gov. Ongoing modernization efforts are focused on providing enhanced capabilities to support panelist functions, notifications and requests, research administration support, and proposal evaluation functionality.</p> <p>This service is covered in the Intelligent\Automation of Grants Management Systems investment.</p>

NSF’s Total Cybersecurity Investments

**National Science Foundation
Total Cybersecurity Investment per the
National Institute of Standards and Technology (NIST) Categorization**

(Dollars in Millions)

NIST Category	FY 2022 Actual			FY 2023 Current Plan			FY 2024 Request		
	AOAM	R&RA	EDU	AOAM	R&RA	EDU	AOAM	R&RA	EDU
Identify	\$1.74	\$5.36	\$0.52	\$1.90	\$5.39	\$0.53	\$2.21	\$5.74	\$0.59
Protect ¹	6.33	189.97	65.08	8.69	191.98	76.53	8.62	195.74	76.91
Detect	1.69	3.48	0.27	2.27	3.81	0.33	2.49	3.90	0.35
Respond	0.38	1.18	0.07	0.42	1.18	0.06	0.47	1.23	0.07
Recover	0.37	1.15	0.06	0.42	1.14	0.06	0.46	1.20	0.07
Account Total	\$10.50	\$201.14	\$66.00	\$13.70	\$203.49	\$77.51	\$14.24	\$207.81	\$77.98
NSF Total		\$277.65			\$294.70			\$300.04	

¹ The Protect category includes investments within the R&RA and EDU account for Cybersecurity Research and Development which represents funding provided by NSF for activities aimed at providing or enhancing security to the broader Federal, military, or national digital ecosystems.

