6. RESEARCH AND DEVELOPMENT

Scientific discoveries, technological breakthroughs, and innovation are essential to expand the frontiers of what is possible and to meet the challenges and opportunities of the 21st Century. Now more than ever, science, technology, and innovation are instrumental to expanding opportunities for the American people, advancing the health of our communities, tackling the climate crisis, advancing global security and stability, realizing the benefits of artificial intelligence (AI) while managing its risks, and fostering a strong, resilient, and thriving democracy. The President's 2025 Budget is a testament to the Administration's commitment to collaborative investments that support the research, development, and application of technologies that advance American health, security, and competitiveness and keep America at the forefront of responsible innovation. The Budget invests $202 billion in research and development (R&D), a $2 billion increase over the 2023 enacted level and a $41 billion increase in R&D investments from the start of the Administration. The Budget provides $99 billion for basic and applied research, an increase of $2.2 billion above the 2023 enacted level and nearly $13 billion above the Administration's initial investments in these fundamental areas.

The Administration is harnessing the power of innovation to address important national missions that have not traditionally benefited from R&D. The Budget supports transformative research approaches—including those based on the successful model of the Defense Advanced Research Projects Agency (DARPA; $4.4 billion)—to tackle pressing societal challenges in health (ARPA-H; $1.5 billion), energy (ARPA-E; $450 million), and transportation (ARPA-I; $15 million). The Budget seeks to expand R&D to areas where those industries and jobs have not customarily thrived by supporting regional innovation initiatives at the National Science Foundation (NSF) and the Department of Commerce. The Administration is also committed to a dual mandate of leveraging AI for good—to improve the lives of the American people, advance knowledge, and make Government more effective—and providing protection from AI's risks.

CHIPS AND SCIENCE ACT

Public Law 117-167, commonly referred to as the CHIPS and Science Act of 2022 (CHIPS and Science Act) authorized discretionary funding for three science agencies: NSF, the Department of Commerce's National Institute of Standards and Technology (NIST), and the Department of Energy's (DOE) Office of Science. The Budget funds these agencies' toplines at $20.1 billion, collectively – a $1.2 billion increase over the 2023 enacted level – to support American innovation and leadership in research and scientific discovery.

- NSF is funded at $10.2 billion, seven percent higher than the 2023 level, including a 36 percent increase for the Directorate for Technology, Innovation, and Partnerships (TIP) and a 4.5 percent increase for emerging technologies. The Budget also supports NSF's STEM workforce programs, a key CHIPS and Science Act priority.
- The DOE Office of Science is funded at $8.6 billion, six percent higher than the 2023 level, to support cutting-edge research at the national laboratories and universities, build and operate world-class scientific user facilities, identify and accelerate novel technologies for clean energy solutions, provide new computing insight through quantum information, and position the United States to meet the demand for isotopes.
- NIST is funded at $1.5 billion, including targeted investments to advance research and standards development for critical and emerging technologies. This total also includes a $182 million increase over the 2023 level for maintenance, renovations, and improvements at its research campuses.

In addition to the funding at these three agencies, the Department of Commerce is responsible for administering $11 billion in CHIPS and Science Act funding to advance U.S. leadership in semiconductor R&D. As part of this, NIST awarded over $100 million across 29 projects in the CHIPS Metrology program. These projects will help inventors and entrepreneurs more easily scale innovations into commercial products.

PRIORITIES FOR FEDERAL RESEARCH AND DEVELOPMENT

Advancing Safe, Secure, and Trustworthy Artificial Intelligence

AI is one of the most powerful technologies of our time. Foundational research in AI and machine learning (ML) has never been more critical to the understanding, creation, and deployment of AI-powered systems that deliver transformative and trustworthy solutions across our society. To ensure that America leads the way in seizing the promise and managing the risks of AI, the Budget invests in AI programs across many agencies to: 1) equip

the Federal Government to use AI technology to better deliver on a wide range of Government missions, 2) mitigate AI risks, and 3) advance public solutions to societal challenges that the private sector will not address on its own.

The Administration has already made significant investments in AI. For example, NSF has awarded 20 National AI Research Institutes and the U.S. Department of Agriculture (USDA) National Institute of Food and Agriculture is supporting five additional AI Institutes through this program. These Institutes represent multisector collaborations among Government, industry, academia, and philanthropy, and are aimed at: 1) advancing fundamental knowledge of AI; 2) using AI to solve real-world problems of importance to the nation; and 3) growing the U.S. AI workforce.

The Budget supports the development of innovative approaches to guide the design of regulatory and enforcement regimes for mitigating AI threats to truth, trust, and democracy; safety and security; privacy, civil rights, and civil liberties; and economic opportunity for all. The Budget bolsters the capacity of the Federal Government to bring in AI-enabling talent and other technological expertise, including the U.S. Digital Service, the Presidential Innovation Fellowship, U.S. Digital Corps, and the Technology Modernization Fund, and the technology offices at the Federal Trade Commission, the Department of Justice, and the Consumer Financial Protection Bureau. In addition, the Budget provides $200 million in mandatory R&D funding that will bolster efforts to harness the capacity of AI to accelerate scientific research across a variety of disciplines at multiple agencies.

The Budget invests in the development and deployment of methods to design, pilot, and assess the results of new approaches to apply AI to improve Government functions and public services. For example, the Budget continues to invest in the Department of Health and Human Services' (HHS) Office of the National Coordinator (ONC) to advance interoperability, improve transparency, and support the access, exchange, and use of electronic health information through the ONC Health Information Technology (IT) Certification Program, which recently established first-of-its-kind transparency requirements for AI and other predictive support algorithms that are part of certified health IT. ONC-certified health IT supports the care delivered by more than 96 percent of hospitals and 78 percent of office-based physicians around the country.

The Budget provides robust investments in AI R&D that span nine focus areas across more than six departments and agencies, including:

- $1.6 billion in investments across the National Institutes of Health (NIH). NIH launched the AI/ML Consortium to Advance Health Equity and Researcher Diversity (AIM-AHEAD) Program in 2021. This program seeks to increase the participation and representation of the researchers and communities that are currently underrepresented in AI/ML modeling and applications through mutually beneficial partnerships;
- $729 million for AI R&D at NSF (a ten percent increase from 2023 enacted), including $30 million for the second year of the National AI Research Resource Pilot, which is aimed at developing a roadmap for standing up a national research infrastructure to broaden access to the resources essential to AI R&D;
- $335 million for AI/ML within DOE, 54 percent above 2023 enacted, to enhance DOE's computing capabilities and support the development of AI testbeds to build foundational models for energy security, national security, and climate resilience as well as continuing support for training new researchers capable of meeting the rising demands for AI talent;
- $310 million for DARPA's AI Forward initiative to research and develop trustworthy technology that operates reliably, interacts appropriately with people, and meets the most pressing national security and societal needs in an ethical manner;
- $50 million at NIST to spearhead development of standards and tests to ensure that AI systems are safe, secure, and trustworthy;
- $37 million for DOE's National Nuclear Security Administration (NNSA) to develop capabilities that assess the potential for AI misuse that enables the development or production of chemical, biological, nuclear, and radiological threats and provides an annual technical assessment of proprietary and open-source large language models; and
- $10 million at the Department of Veterans Affairs (VA) to support medical and prosthetic research.

These investments hold promise for catalyzing groundbreaking advancements across all sectors of society.

Maintaining Global Security and Stability

In the face of immense geopolitical changes and evolving risks, the Budget supports R&D that will create the next generation of national security technologies and capabilities that will promote and protect the health, safety, and prosperity of the American people. At a time when our allies and partners look to American leadership to uphold global security, it is crucial to not only mitigate critical national security risks but also propel the responsible development and adoption of technology at a pace that aligns with the demands of a competitive global environment.

The Budget includes $92.8 billion in Department of Defense (DOD) R&D to support the development of next generation defense capabilities, including in critical and emerging technology areas such as AI and autonomy; quantum information science; biotechnology and biomanufacturing; advanced materials; next generation wireless communication; human-machine interfaces; directed energy, hypersonic system development; integrated sensing and cyber; and microelectronics. Since 2022, the Administration has made significant investments in these critical and emerging technology areas with a focus on technology development, prototype maturation, and the transition of promising prototypes to fully-developed defense capabilities to satisfy military requirements.

Civilian and defense agencies are cooperating to harness science and technology intelligence and develop analytic capabilities to assess U.S. competitiveness. Specifically, NSF and DOD will work together in a central interagency hub to conduct Global Competitive Analysis that will deliver a comprehensive and data-driven view of the competitive dynamics between the U.S., its allies, and its adversaries across the breadth of the technology ecosystem, including technologies and broader policy enablers.

The Budget supports DOE's NNSA science-based program to maintain a safe, secure, and reliable nuclear stockpile, including $683 million for inertial confinement fusion to replicate in a laboratory environment conditions of a nuclear detonation and $880 million for advanced simulation and computing to interpret the vast data from such experiments. The Budget also provides $69 million to conduct early technical assessments of future nuclear capabilities and threats.

DOE's NNSA will mature new capabilities for space situational awareness to reinforce arms control and verification missions in support of current treaties, like the Outer Space Treaty. This work protects our national interests and assets, providing information on activities all the way to the lunar surface and beyond. Specifically, the Budget funds the NNSA Space Monitoring and Verification Program at $35 million, advancing our space-based sensing capability.

Tackling the Climate Crisis and Environmental Impacts

Building on the climate funding and tax benefits enacted in the Infrastructure Investment and Jobs Act (IIJA; Public Law 117-58) and Public Law 117-169, commonly referred to as the Inflation Reduction Act of 2022 (IRA) to spur deployment of currently available climate and clean energy solutions, the Budget prioritizes R&D investments that advance the Administration's climate goals, including by leading the world on next generation technology development, harnessing the power of nature, strengthening and protecting the health of communities, especially those disproportionately impacted by climate change, lowering energy costs for families, protecting biodiversity, and creating good-paying jobs here in the United States.

The Budget supports over $10.7 billion in clean energy innovation activities that are crucial for the nation to achieve net-zero greenhouse gas emissions economywide no later than 2050 as embodied in the Long-Term Strategy of the United States: Pathways to Net-Zero Greenhouse Gas Emissions by 2050. Since the start of the Administration, the President has requested, and Congress has enacted, year-over-year increases in the total Government-wide funding for clean energy innovation. The Net-Zero Game Changers Initiative frames 37 innovative technologies, systems, and solutions that will drive significant emissions reductions across sectors. For example, the Budget includes $844 million for a DOE-wide initiative to accelerate the viability of commercial fusion energy, coordinating academia, national laboratories, and the private sector, which supports the Bold Decadal Vision for Commercial Fusion Energy. In addition, DOE's Energy Earthshots initiative aligns climate and energy innovation programs towards a common purpose linking innovation to widespread commercial adoption with the Pathways to Commercial Liftoff effort. The Budget includes $450 million for ARPA-E, which will advance high-impact transformational technologies to cut emissions and make our infrastructure smarter and more resilient, as well as over $3.1 billion for the Office of Energy Efficiency and Renewable Energy to conduct R&D across clean energy sources and uses, ranging from solar and energy to buildings and manufacturing. The Budget also includes $143 million within the DOE Office of Nuclear Energy for five ongoing cost-shared projects to resolve technical, operational, and regulatory challenges and enable future demonstration of a diverse set of advanced reactor designs. The Budget invests $325 million for critical minerals R&D across DOE to advance the goals of increasing domestically-sourced critical minerals, supporting more sustainable extraction, and minimizing supply chain disruptions for products that rely on critical minerals such as batteries for electric vehicles. At NASA, the Budget calls for more than $500 million for green aviation research and development activities, which will lead to the introduction of ultra-efficient U.S.-made commercial airliners in the next decade.

Further, to advance our understanding of climate change and its implications, the Budget supports $4.5 billion in climate research activities, including the U.S. Global Change Research Program's (USGCRP) Decadal Strategic Plan. The Budget also advances, through coordination by USGCRP, the development of actionable climate services consistent with the Federal Framework and Action Plan, to support communities, Governments, and businesses in enhancing resilience and taking action. USGCRP activities in the Budget include:

- $407 million to support DOE's Office of Science in improving the predictability of climate trends and impacts using high performance computing and advances climate modeling.
- $54 million at the Environmental Protection Agency (EPA) to support USGCRP assessments, air and water quality research, environmental assessments of mitigation technologies, and the Creating Resilient Water Utilities initiative;
- $69 million for the U.S. Geological Survey's National and Regional Climate Adaptation Science Centers, including support for interagency climate resilience technical assistance and climate service coordination;
- $16 million for the National Oceanic and Atmospheric Administration's Climate Adaptation Partnerships, which will support collaborative efforts that help communities build equitable climate resilience;
- $150 million at NASA to develop the next generation of Landsat satellites, which will provide important

data for water resource management and climate science; and

- $218 million at the USDA, including $27 million for Climate Hubs.

The Budget supports increased coordination and integration of greenhouse gas measurement and monitoring activities, consistent with the National Strategy to Advance an Integrated U.S. Greenhouse Gas Measurement, Monitoring, and Information System. This includes continued support for multi-agency efforts like the U.S. Greenhouse Gas Center and research to better understand greenhouse gas emissions and removals from natural systems.

The Budget funds R&D efforts to improve analysis for difficult-to-monetize or -quantify policy options and technologies such as ecosystem services, track natural assets through the increasingly developed national system of environmental and economic statistics (i.e., natural capital accounting), support the National Nature Assessment, and advance recommendations in the Nature-Based Solutions Roadmap. Natural capital accounting capabilities and research continue to evolve and grow consistent with the National Strategy to Develop Statistics for Environmental-Economic Decisions and are supported in the Budget within the Department of the Interior's (DOI) United States Geological Survey, USDA's Economic Research Service and Forest Service, the DOE's Energy Information Administration, the Department of Commerce's Bureau of Economic Analysis and National Oceanic and Atmospheric Administration, and the EPA.

The Budget also supports increased investment in R&D that would improve Federal land and water management as risks to natural resources increase due to climate change. The Budget provides $5 million to support the establishment of the Joint Office for Wildfire Science and Technology between USDA's Forest Service and DOI. In line with recommendations from the President's Council of Advisors on Science and Technology and the Wildland Fire Mitigation and Management Commission, this office would lead Forest Service and DOI's development, deployment, and sustainment of technology, science, and data to be used to improve safety, effectiveness, and cost efficiency across the full spectrum of wildland fire management operations. The Budget also provides $30 million for Bureau of Reclamation research and development supporting applied research to increase water conservation and expand water supplies, including $7 million for desalination and water purification.

Achieving Better Health Outcomes for Every Person

The President's Budget makes major investments in R&D activities to achieve better health outcomes in communities across the United States.

The President has set the ambitious goals of cutting the age-adjusted death rate from cancer by at least 50 percent over the next 25 years, preventing more than four million cancer deaths by 2047, and improving the experience of people who are touched by cancer. The Budget robustly funds activities to help the Cancer Moonshot achieve its goal of ending cancer as we know it, including efforts to close the screening gap, understand and address environmental and toxic exposures, decrease the impact of preventable cancers, bring cutting-edge research through the pipeline of patients and communities, and support patients and caregivers.

At more than $3.4 billion in R&D for Cancer Moonshot-related investments, the Budget supports laboratory, clinical, public health, and environmental health research programs that span five focus areas across more than a dozen departments and agencies, including:

- $2.9 billion in discretionary and mandatory resources at HHS supporting Cancer Moonshot activities across the National Cancer Institute, and cancer projects at the Advanced Research Projects Agency for Health (ARPA-H);
- $521 million at EPA to support cancer prevention and environmental justice priorities;
- $45 million for VA's Cancer Moonshot clinical and research initiatives; and
- $30 million for research at DOD and $59 million for the Murtha Cancer Center Research Programs—the APOLLO project, the Framingham Blood Serum Program, and the Cancer Research and Clinical Trials Network.

Since its launch in March 2022, ARPA-H has initiated multiple programs and onboarded 50 program managers as they work towards their ambitious goals. The R&D programs funded by ARPA-H impact cancer and other diseases, conditions, and disruptive health systems and continued funds will allow ARPA-H to successfully launch programs, such as the Novel Innovations for Tissue Regeneration in Osteoarthritis, Precision Surgical Interventions, and Platform Accelerating Rural Access to Distributed & InteGrated Medical care.

The Budget provides $317 million to bolster the capacity to mitigate current and emerging health threats across the Centers for Disease Prevention and Control, including addressing antimicrobial resistance investing in advanced molecular detection, wastewater surveillance and continued support for the Center for Forecasting, and Outbreak Analytics. The Budget will continue to make progress toward ending the HIV epidemic globally with bilateral assistance through the President's Emergency Plan for AIDS Relief (PEPFAR).

To achieve the promise of the President's Unity Agenda, the Budget emphasizes R&D investments to tackle an unprecedented mental health crisis, with resources targeted towards at-risk communities like caregivers, medical professionals, youth, and members of the LGBTQI+ community by providing support for behavioral and mental health for all Americans. The Budget emphasizes suicide prevention and mental health of our veterans with over $135 million for VA Medical Care.

Reducing Barriers and Inequalities While Strengthening Research

The Budget supports workforce development in science, technology, engineering, and mathematics (STEM) all across America with an emphasis on emerging research institutions and historically underserved communities. In addition, the Budget increases funding for work to secure the Nation's research enterprise, make that enterprise more efficient, and increase public access to federally-funded research.

Key workforce efforts include:

- NSF's programs to broaden participation of underrepresented groups in STEM education and research programs, such as Expanding AI Innovation through Capacity Building and Partnerships (ExpandAI) and the Experiential Learning for Emerging and Novel Technologies (ExLENT) program;
- Department of Commerce efforts to nurture STEM talent and develop the EDA's STEM Talent Challenge; and
- The Minority Serving Institution Partnership Program at DOE's NNSA and DOE's Reaching a New Energy Sciences Workforce (RENEW) program.

Multiple agencies are also supporting and building R&D capacity at Historically Black Colleges and Universities (HBCUs), Tribally Controlled Colleges and Universities (TCCUs), and Minority Servicing Institutions (MSIs):

- DOE proposes to build capacity for advancing energy research and developing a new energy workforce at HBCUs, MSIs, Tribal Colleges, Community Colleges and emerging research institutions;
- NSF supports education and research at minority-serving institutions through programs such as HBCU – Excellence in Research, HBCU – Undergraduate Program, Hispanic Serving Institutions Program, and the Tribal Colleges and Universities Program;
- DOD proposes to fund individual grants in research areas important to the DOD, equipment, and cooperative agreements with HBCUs and other minority-serving institutions;
- The Department of Transportation invests in the University Transportation Centers
- NASA supports the Minority University Research & Education Project to build STEM capacity and retain underrepresented students in STEM at minority-serving institutions; and
- The Department of Homeland Security proposes to support summer research experiences for MSI participants in order to advance research areas of importance to DHS and strengthen the talent pool for the homeland security enterprise.

Research security efforts in both the industrial and academic sectors continue to identify and address challenges to protect the Nation's research enterprise. NSF will stand up the SECURE Center, authorized by the CHIPS and Science Act, to serve as a clearinghouse for research security information to share with the research community, to share information and reports on research security risks, and to provide training to the research community. NSF is also identifying ways to use the Growing Research Access for Nationally Transformative Equity and Diversity (GRANTED) program, an initiative to increase participation and competitiveness of researchers and investigators at emerging research institutions, to support research security assistance at HBCUs, MSIs, and TCCUs. At NIH, funding will support the Offices of Data Science to oversee data management and sharing, the responsible use of data, data science training to staff, and new funding programs in data science. These efforts strengthen the data science workforce within NIH and provide a strong foundation for continued growth.

The Budget includes funding at multiple agencies for the infrastructure and capacity to provide free, immediate, and equitable public access to federally-funded research results, while developing mechanisms to incentivize and reward open, reproducible, and secure research practices, in ways that benefit individuals, industry, and innovators everywhere. For example, the Budget proposes investments at NSF to support public access activities, such as those through the Findable, Accessible, Interoperable, and Reusable Research Coordination Networks and Pathways to Enable Open-Source Ecosystems programs, which aim to support best practices in open science through coordination of research projects, development of community standards, advancing educational opportunities, and fostering synthesis and new collaborations. At NASA, the Budget includes funding to advance its Transform to Open Science Initiative, developing training and incentivizing researchers to accelerate adoption of practices that increase public access to the Nation's taxpayer-supported research.

The Budget supports new approaches to achieve agency missions, such as streamlining processes to minimize administrative burdens, engaging new R&D performers, exploring new R&D methods, and forging new partnerships. The Administration's evidence agenda includes the design and implementation of rigorous experiments and evaluations, data sharing agreements, and prototyping exercises to answer critical policy questions by generating comparative evidence about how well different approaches can help us reach national goals more equitably, effectively, and expeditiously, with appropriate privacy protections in place. These efforts include:

- A Census Bureau partnership with the National Telecommunications and Information Administration (NTIA) to understand the economic impacts of broadband infrastructure, adoption, and digital equity by providing detailed, single-year estimates, as

well as through its community resilience estimates, which include broadband access as a metric for assessing the capacity of communities to cope with and respond to disasters; and

- NSF's Analytics for Equity Initiative, which pilots a new way to support social, economic, and behavioral sciences research that leverages federal data assets (ensuring privacy is protected and data are secure) and scientific advances in researching equity-related topics for greater.

Bolstering R&D for Future Economic Competitiveness

The Administration prioritizes supporting and expanding applied research, experimental development, pre-commercialization, standards, and related efforts that will facilitate the adoption of a broad range of new technologies. Emerging technology R&D efforts include:

- Robust funding for biotechnology and biomanufacturing research and development, including all components of the pre-commercial pipeline, that support bio in the economy;
- $900 million, an increase of 36 percent from 2023, for NSF's TIP Directorate, which focuses on building partnerships across R&D sectors to translate basic R&D to products and processes that can benefit the American people; and
- $606 million at DOE's Office of Science to integrate supercomputing, AI, and quantum-based technology for developing next-generation high performance computing systems to ensure U.S. leadership while broadening access to leading-edge computing resources by the community.

The Budget builds on regional innovation and resilience by invigorating communities and traditional or emerging industries to spark growth and create good-paying jobs. This builds on the Inflation Reduction Act's R&D payroll tax credit, which incentivizes qualified R&D activities while reducing tax liability for companies. Notable investments include $4 billion in mandatory funding and $41 million in discretionary funding for EDA's Regional Technology and Innovation Hub Program. This funding would enable EDA to establish cutting-edge and strategic regional technology hubs that foster the geographic diversity of innovation and create quality jobs in underserved and vulnerable communities. The Budget also includes $205 million for the Regional Innovation Engines program in NSF's TIP Directorate, which was first proposed by the Administration in 2022 and recently announced awards of up to $160 million each over ten years to 10 teams spanning universities, nonprofits, businesses and other organizations across the United States. Both programs have made important strides and issued initial awards in 2023 and the Budget will drive additional growth to create innovation ecosystems in parts of the Nation that do not have them.

FEDERAL RESEARCH AND DEVELOPMENT DATA

R&D is the collection of efforts directed toward gaining greater knowledge or understanding and applying knowledge toward the production of useful materials, devices, and methods. R&D investments can be characterized as basic research, applied research, development, R&D equipment, or R&D facilities. The Office of Management and Budget has used those or similar categories in its collection of R&D data since 1949. Please note that R&D crosscuts in specific topical areas as mandated by law will be reported separately in forthcoming Supplements to the President's 2025 Budget.

Background on Federal R&D Funding

More than 20 Federal agencies fund R&D in the United States. The character of the R&D that these agencies fund depends on the mission of each agency and on the role of R&D in accomplishing it. Table 6-1 shows agency-by-agency spending on basic research, applied research, experimental development, and R&D equipment and facilities.

Basic research is systematic study directed toward a fuller knowledge or understanding of the fundamental aspects of phenomena and of observable facts without specific applications toward processes or products in mind. Basic research, however, may include activities with broad applications in mind.

Applied research is systematic study to gain knowledge or understanding necessary to determine the means by which a recognized and specific need may be met.

Experimental development is creative and systematic work, drawing on knowledge gained from research and practical experience, which is directed at producing new products or processes or improving existing products or processes. Like research, experimental development will result in gaining additional knowledge.

Research and development equipment includes acquisition or design and production of movable equipment, such as spectrometers, research satellites, detectors, and other instruments. At a minimum, this category includes programs devoted to the purchase or construction of R&D equipment.

Research and development facilities include the acquisition, design, and construction of, or major repairs or alterations to, all physical facilities for use in R&D activities. Facilities include land, buildings, and fixed capital equipment, regardless of whether the facilities are to be used by the Government or by a private organization, and regardless of where title to the property may rest. This category includes such fixed facilities as reactors, wind tunnels, and particle accelerators.

Table 6–1. FEDERAL RESEARCH AND DEVELOPMENT SPENDING

(Mandatory and discretionary budget authority[1], dollar amounts in millions)

	2023 Actual	2024 Estimate[2]	2025 Proposed	Dollar Change: 2024 to 2025	Percent Change: 2024 to 2025
By Agency					
Defense[3]	95,541	90,632	92,757	2,125	2%
Health and Human Services	48,393	47,591	51,364	3,773	8%
Energy	20,790	22,237	23,440	1,203	5%
NASA	11,691	11,797	11,715	-82	-1%
National Science Foundation	7,988	7,800	8,122	322	4%
Agriculture	3,380	3,379	3,283	-96	-3%
Commerce	5,141	3,930	3,926	-4	0%
Veterans Affairs	1,684	1,799	1,709	-90	-5%
Transportation	1,411	1,462	1,513	51	3%
Interior	1,296	1,258	1,330	72	6%
Homeland Security	634	634	544	-90	-14%
Environmental Protection Agency	568	568	614	46	8%
Education	389	446	441	-5	-1%
Smithsonian Institution	347	347	390	43	12%
Other	702	684	601[4]	-83	-12%
AI Mandatory Proposal	0	0	200	200	.....
TOTAL	**199,955**	**194,564**	**201,949[4]**	**7,385**	**4%**
Basic Research					
Defense	2,847	2,519	2,493	-26	-1%
Health and Human Services	23,097	22,748	23,602	854	4%
Energy	6,775	6,324	6,923	599	9%
NASA	5,115	5,417	5,302	-115	-2%
National Science Foundation	6,290	6,134	6,267	133	2%
Agriculture	1,392	1,386	1,383	-3	0%
Commerce	316	316	355	39	12%
Veterans Affairs	683	756	718	-38	-5%
Transportation	.....	.....	.....	.....	.....
Interior	101	99	105	6	6%
Homeland Security	62	62	62	0	0%
Environmental Protection Agency	.....	.....	.....	.....	.....
Education	29	28	28	0	0%
Smithsonian Institution	314	314	351	37	12%
Other	2	2	2	0	0%
AI Mandatory Proposal	0	0	93	93	.....
SUBTOTAL	**47,023**	**46,105**	**47,684**	**1,579**	**3%**
Applied Research					
Defense	8,013	6,237	6,024	-213	-3%
Health and Human Services	24,819	24,363	27,262	2,899	12%
Energy	6,643	7,086	7,351	265	4%
NASA	1,843	1,948	2,228	280	14%
National Science Foundation	1,178	1,155	1,215	60	5%
Agriculture	1,371	1,372	1,358	-14	-1%
Commerce	1,637	1,495	1,412	-83	-6%
Veterans Affairs	965	1,007	953	-54	-5%
Transportation	981	1,036	1,045	9	1%
Interior	990	955	1,014	59	6%
Homeland Security	161	161	149	-12	-7%
Environmental Protection Agency	441	441	477	36	8%
Education	256	292	290	-2	-1%
Smithsonian Institution	.....	.....	.....	.....	.....
Other	427	382	346	-36	-9%
AI Mandatory Proposal	0	0	97	97	.....
SUBTOTAL	**49,725**	**47,930**	**51,221**	**3,291**	**7%**

Table 6–1. FEDERAL RESEARCH AND DEVELOPMENT SPENDING —Continued

(Mandatory and discretionary budget authority[1], dollar amounts in millions)

	2023 Actual	2024 Estimate[2]	2025 Proposed	Dollar Change: 2024 to 2025	Percent Change: 2024 to 2025
Experimental Development					
Defense[3]	84,681	81,624	84,019	2,395	3%
Health and Human Services	46	58	58	0	0%
Energy	4,499	5,270	5,343	73	1%
NASA	4,654	4,399	4,133	-266	-6%
National Science Foundation	.....	.....	.....	.....	.....
Agriculture	295	296	334	38	13%
Commerce	2,361	1,627	1,510	-117	-7%
Veterans Affairs	36	36	38	2	6%
Transportation	384	384	391	7	2%
Interior	203	202	209	7	3%
Homeland Security	356	356	283	-73	-21%
Environmental Protection Agency	127	127	137	10	8%
Education	104	126	123	-3	-2%
Smithsonian Institution	.....	.....	.....	.....	.....
Other	271	298	253	-45	-15%
AI Mandatory Proposal	.....	.....	.....	.....	.....
SUBTOTAL	**98,017**	**94,803**	**96,831**	**2,028**	**2%**
Facilities and Equipment					
Defense	0	252	221	-31	-12%
Health and Human Services	431	422	442	20	5%
Energy	2,873	3,557	3,823	266	7%
NASA	79	33	52	19	58%
National Science Foundation	520	511	640	129	25%
Agriculture	322	325	208	-117	-36%
Commerce	827	492	649	157	32%
Veterans Affairs	.....	.....	.....	.....	.....
Transportation	46	42	77	35	83%
Interior	2	2	2	0	0%
Homeland Security	55	55	50	-5	-9%
Environmental Protection Agency	.....	.....	.....	.....	.....
Education	.....	.....	.....	.....	.....
Smithsonian Institution	33	33	39	6	18%
Other	2	2	0[4]	-2	-100%
AI Mandatory Proposal	0	0	10	10	.....
SUBTOTAL	**5,190**	**5,726**	**6,213**[4]	**487**	**9%**

[1] This table shows funding levels for Departments or Independent agencies with more than $200 million in R&D activities in 2025.

[2] The 2024 Estimate column applies the main 2025 Budget volume approach of using annualized appropriations provided by the 2024 Continuing Resolution.

[3] DOD's contribution to the overall Federal R&D budget includes DOD Research, Development, Test, and Evaluation Budget Activities 6.1 through 6.6 (Basic Research; Applied Research; Advanced Technology Development; Advanced Component Development and Prototypes; System Development and Demonstation; and Management Support).

[4] Does not match the amount published in the 2025 Appendix, but is the correct amount.