Congressional Research Service
Informing the legislative debate since 1914

Federally Funded Research and Development Centers (FFRDCs): Background and Issues for Congress

Updated April 3, 2020

Congressional Research Service
https://crsreports.congress.gov
R44629

CRS REPORT
Prepared for Members and
Committees of Congress

Summary

The federal government supports research and development (R&D) that is conducted by a wide variety of performers, including federally owned and operated laboratories, universities, private companies, and other research institutions. A special class of research institutions referred to as federally funded research and development centers, or FFRDCs, are owned by the federal government, but operated by contractors, including universities, other non-profit organizations, and industrial firms. FFRDCs are intended to provide federal agencies with R&D capabilities that cannot be effectively met by the federal government or the private sector alone. FFRDCs are required to have a long-term strategic relationship with the federal agency that supports them. This relationship is presumed to convey a number of benefits, including the ability of an FFRDC to recruit and retain scientific and technical expertise; an in-depth knowledge of, and the capability to rapidly respond to, the R&D needs of the federal agency; and the capacity to offer independent and objective scientific and technical advice. Currently, 13 federal agencies sponsor or co-sponsor a total of 42 FFRDCs. These FFRDCs provide R&D capabilities in support of federal agency missions in a broad range of areas—from energy and cybersecurity to cancer and astronomy. In FY2019, the federal government reported obligations of $14.9 billion or 10.5% of its total estimated R&D spending to FFRDCs.

Congress maintains a continuing interest in FFRDCs due to their contributions to U.S. technological and economic leadership. However, some Members of Congress have questioned the appropriate role of FFRDCs in the federal R&D enterprise and the ability of FFRDCs to effectively address federal agency R&D needs. The following issues have been of particular interest: (1) the effectiveness of federal agency oversight and management of FFRDCs; (2) competition between FFRDCs and the private sector for federal R&D funding; (3) the diversification of FFDRC activities or “mission creep”; (4) the award of noncompetitive FFRDC management and operation contracts; and (5) the adequacy of FFRDC facilities and infrastructure.

Contents

Background 1
Origins of FFRDCs 1
Current FFRDCs 2
Characteristics of FFRDCs 4
Federal Funding of FFRDCs 5
Issues for Congress 11
Effectiveness of Oversight and Management 11
Competition with the Private Sector 14
Mission Creep 15
Competition of FFRDC Contracts 17
Condition of FFRDC Infrastructure 19

Figures

Figure 1. Share of Federal R&D Obligations by R&D Performer, FY2019 6
Figure 2. Federal Obligations to FFRDCs by Character of Work, FY2019 7
Figure 3. Share of Federal R&D Obligations to FFRDCs, FY1967-FY2019 8
Figure 4. Federal R&D Obligations to FFRDCs, FY1967-FY2019 10

Figure B-1. Number of FFRDCs by Fiscal Year, 1967-2020 24

Tables

Table 1. Preliminary Federal Agency R&D Obligations to FFRDCs, FY2019 11

Appendixes

Appendix A. List of Federally Funded Research and Development Centers, as of March 2020 20
Appendix B. Number of FFRDCs, FY1967–FY2020 24

Contacts

Author Information 24

Background

Federally funded research and development centers (FFRDCs) are a special type of government-owned, contractor-operated research centers—commonly referred to as "GOCOs"—that conduct research and development (R&D) and related activities in support of a federal agency's mission. FFRDCs operate under the framework of the Federal Acquisition Regulation.[1] They differ from other performers of federal R&D—such as federal laboratories, universities, non-profit organizations, and private firms—in that they are designed to meet a "special long-term research or development need which cannot be met as effectively by existing in-house or contractor resources" and that they have "access, beyond that which is common to the normal contractual relationship, to Government and supplier data, including sensitive and proprietary data, and to employees and installations equipment and real property."[2]

Over the years, Congress has been concerned with the oversight and management of FFRDCs, lack of competition in contracting, and mission creep. More recently, some Members of Congress have focused on the need to balance responsible oversight with improved efficiency, effectiveness, and innovation.[3] Additionally, the role of FFRDCs in the federal R&D enterprise, including the use of FFRDCs as a model for the governance of federal laboratories, has been an area of congressional interest. The use and management of FFRDCs, in addition to their role in the federal R&D enterprise, will likely be of interest in the 116th Congress.

Origins of FFRDCs

FFRDCs have their origin in World War II. During that time, the federal government sought to mobilize the country's scientific and engineering talent and apply it to the development of technologies that would aid U.S. war efforts. For example, the Department of Defense's (DOD's) Lincoln Laboratory was created to develop radar for identifying aircraft and ships and the Los Alamos and Oak Ridge National Laboratories (now under the auspices of the Department of Energy [DOE]) were established to support the development of the atomic bomb. The purpose of FFRDCs—to bring scientific and technical expertise to bear on pressing R&D challenges—remains.

Then, as now, it was widely believed that a lack of flexibility in the federal government made it difficult to recruit and maintain scientific and technical talent.[4] Since FFRDCs are operated by contractors, many federal restrictions, including restrictions on pay and hiring, do not apply, in effect increasing the flexibility of FFRDCs compared to the federal government.[5]

FFRDCs were called "Federal Contract Research Centers" until 1967.[6] In November 1967, the chairman of the Federal Council for Science and Technology, a predecessor to the National

[1] Federal Acquisition Regulation, 35.017.

[2] Ibid.

[3] U.S. Congress, House Committee on Science, Space, and Technology, *Recommendations of the Commission to Review the Effectiveness of the National Energy Laboratories*, hearing, 114th Cong., 1st sess., November 18, 2015.

[4] Jill M. Hruby et al., *The Evolution of Federally Funded Research & Development Centers*, Public Interest Report, Federation of American Scientists, Spring 2011, p. 24.

[5] CRS Report RL30533, *The Quasi Government: Hybrid Organizations with Both Government and Private Sector Legal Characteristics*, by Kevin R. Kosar.

[6] National Science Foundation, *Annotated List of 36 Federally Funded Research and Development Centers: Fiscal Year 2002*, General Notes, at https://wayback.archive-it.org/5902/20160210231601/http://www.nsf.gov/statistics/nsf02317/notes.htm.

Science and Technology Council,[7] sent a memorandum to federal science agencies formally changing the name of Federal Contract Research Centers to FFRDCs and detailing criteria for the establishment of an FFRDC.[8] Accordingly, an FFRDC was required to:

- conduct basic research, applied research, or development, or perform R&D management;
- be independently incorporated or constitute a separate organizational unit within the parent organization;
- perform R&D under the direction of the federal government;
- receive 70% or more of its funding from one agency;
- have a long-term relationship with its sponsoring agency (five years or more);
- be government-owned; and
- have an average annual budget of at least $500,000.[9]

In 1984, the Office of Federal Procurement Policy (OFPP) issued a policy letter revising and updating the governance of FFRDCs.[10] The OFPP issued regulations in 1990 that incorporated the principles articulated in the policy letter as part of the Federal Acquisition Regulation (FAR).[11] The FAR now defines the purposes of an FFRDC, in addition to the policies that direct an FFRDC's establishment, use, review, and termination. The "Characteristics of FFRDCs" as defined by the FAR are discussed in more detail later in this report.

Current FFRDCs

Currently, 13 federal agencies sponsor or co-sponsor a total of 42 FFRDCs.[12] These FFRDCs provide R&D capabilities in a broad range of areas—from energy and cybersecurity to cancer and astronomy. DOE and DOD sponsor a majority of the FFRDCs, 16 and 10 respectively. The National Science Foundation (NSF) sponsors 5 centers, the Department of Homeland Security (DHS) sponsors 3, and the Department of Health and Human Services (HHS) sponsors 2. The National Aeronautics and Space Administration (NASA), the National Institute of Standards and Technology (NIST), the Department of Transportation (DOT), the Nuclear Regulatory Commission (NRC), and the United States Courts each sponsor a single FFRDC. The Department of the Treasury (Treasury), the Department of Veterans Affairs (VA), and the Social Security Administration co-sponsor a single FFRDC that serves all three.

FFRDCs are classified in three "activity type" categories under a system established by DOD and adopted by NSF. According to NSF, the three categories—R&D laboratory, study and analysis center, or system engineering and integration center are defined as follows:

> **Research and development laboratories** fill voids where in-house and private sector research and development centers are unable to meet agency core area needs. Specific objectives for these FFRDCs are to: (1) maintain over the long-term a competency in

[7] The National Science and Technology Council, located within the Executive Office of President, is tasked with coordinating science and technology policy across the federal government.

[8] National Science Foundation, *Annotated List of 36 Federally Funded Research and Development Centers: Fiscal Year 2002*, General Notes.

[9] Ibid.

[10] 49 *Federal Register* 14462, April 11, 1984.

[11] 55 *Federal Register* 3885, February, 1990. These regulations are codified in Federal Acquisition Regulation 35.017.

[12] National Science Foundation, *Master Government List of Federally Funded R&D Centers*, current as of March 2020, at http://www.nsf.gov/statistics/ffrdclist/.

technology areas where the Government cannot rely on in-house or private sector capabilities, and (2) develop and transfer important new technology to the private sector so the Government can benefit from a wider, broader base of expertise. R&D laboratories engage in research programs that emphasize the evolution and demonstration of advanced concepts and technology, and the transfer or transition of technology.

Study and analysis centers deliver independent and objective analyses and advise in core areas important to their sponsors in support of policy development, decisionmaking, alternative approaches, and new ideas on issues of significance.

System engineering and integration centers provide required support in core areas not available from sponsor's in-house technical and engineering capabilities to ensure that complex systems meet operational requirements. The centers assist with the creation and choice of system concepts and architectures, the specification of technical system and subsystem requirements and interfaces, the development and acquisition of system hardware and software, the testing and verification of performance, the integration of new capabilities, and continuous improvement of system operations and logistics. They often play a critical role in assisting their sponsors in technically formulating, initiating, and evaluating programs and activities undertaken by firms in the for-profit sector. [13]

NSF has the responsibility of maintaining a master list of FFRDCs across the federal government. According to NSF and as shown in **Appendix A**, 26 of the 42 current FFRDCs are R&D laboratories, 10 are study and analysis centers, and 6 are system engineering and integration centers.

DOD Definitions of FFRDC Categories

In 2018, under the *DOD Federally Funded Research and Development (FFRDC) Program*, the department adopted the following DOD specific definitions for the three categories of FFRDCs:

- Research and development laboratory FFRDCs conduct research and development, focusing on the development and prototyping of new technologies and capabilities to meet DOD needs. Research and development laboratory FFRDCs engage in research programs that emphasize the evolution and demonstration of advanced concepts and technology, and transfer new technology to the private sector in accordance with their sponsoring agreements.
- Studies and analysis center FFRDCs deliver independent and objective analyses and advice in core work areas important to the DOD in support of policy and strategy development, decisionmaking, alternative approaches, and new ideas on significant issues for the DOD.
- Systems engineering and integration center FFRDCs meet long-term technical and engineering needs with independence and objectivity to ensure complex systems meet operational requirements. Systems engineering and integration FFRDCs assist work sponsors with the development and choice of system concepts and architectures; specification of technical system and subsystem requirements and interfaces; prioritization of system-of-systems engineering capabilities, especially for joint operations; development and acquisition of system hardware and software; testing and verification of performance; integration and interoperability of new capabilities; continuous improvement of system operations and logistics; evaluation of programs and activities undertaken by for-profit organizations; and transfer of new technology to the private sector in accordance with their sponsoring agreements.[14]

[13] National Science Foundation, "Master Government List of Federally Funded R&D Centers," at https://www.nsf.gov/statistics/ffrdclist/#def.

[14] U.S. Department of Defense, *DOD Instruction 5000.77: DOD Federally Funded Research and Development Center (FFRDC) Program*, October 15, 2018, at https://www.esd.whs.mil/Portals/54/Documents/DD/issuances/dodi/500077p.PDF?ver=2019-12-13-105837-287.

Characteristics of FFRDCs

The Federal Acquisition Regulation system (FAR) governs the establishment, use, review, and termination of FFRDCs.[15] According to the FAR, FFRDCs are intended to address an R&D need that cannot be met as effectively by the federal government or the private sector alone. Essentially, FFRDCs are intended to only perform work that cannot be done by other contractors. FFRDCs accomplish their R&D through a strategic relationship with their sponsoring agency. Two overarching characteristics—special access and longevity—define this strategic relationship.

An FFRDC may be given special access to government and supplier data, employees, and facilities.[16] This access is beyond what is typical in a normal contractual relationship and may include access to sensitive and proprietary information. Accordingly, the FAR requires that FFRDCs (1) operate in the public interest with objectivity and independence, (2) be free from organizational conflicts of interest, and (3) fully disclose their activities to their sponsoring agency.[17] Additionally, FFRDCs are not allowed to use their special access to privileged information, equipment, or property to compete with the private sector for federal R&D contracts. However, an FFRDC is allowed to perform work for other agencies when the capabilities of the FFRDC are not available in the private sector. Finally, the prohibition against competing with the private sector for federal R&D contracts does not apply to the parent organization or any subsidiary of the parent organization associated with an FFRDC.[18]

The other defining characteristic is the long-term relationship between an FFRDC and its sponsoring agency. Under the FAR, the initial contract period of an FFRDC may be up to five years, but these contracts may be renewed, following a review, in increments of up to five years.[19] For example, one DOE FFRDC—the Pacific Northwest National Laboratory—has been operating under the same contract since 1964. The FAR encourages long-term contracts to provide stability and continuity that are intended to allow an FFRDC to attract high-quality personnel.[20] Additionally, under the FAR, a long relationship is required to enable the FFRDC to maintain in-depth expertise, stay familiar with the needs of the agency, provide a quick response capability, and maintain objectivity and independence.[21]

In addition to the described characteristics and requirements, prior to establishing an FFRDC, a sponsoring agency must make sure that there are no existing alternatives for addressing the agency's R&D needs (i.e., the research cannot be done effectively by the federal government or the private sector) and that the agency has the expertise necessary to review the performance of the FFRDC.[22] The sponsoring agency must also ensure that cost controls are in place and that the purpose and mission of the FFRDC are clearly defined.[23]

Other organizations, such as University Affiliated Research Centers (UARCs), have characteristics and requirements similar to those of FFRDCs. A brief description of UARCs is provided in the following box.

---

[15] Federal Acquisition Regulation 35.017.

[16] Federal Acquisition Regulation 35.017(a)(2).

[17] Ibid.

[18] Federal Acquisition Regulation 35.017-1(c)(4).

[19] Federal Acquisition Regulation 35.017-1(e).

[20] Federal Acquisition Regulation 35.017(a)(4).

[21] Ibid.

[22] Federal Acquisition Regulation 35.017-2.

[23] Ibid.

University Affiliated Research Centers (UARCs)

Currently, there are 13 University Affiliated Research Centers all sponsored by a DOD military service, agency, or component. UARCs provide an engineering, research, or development capability to the federal agency that supports them. UARCs are located within a university or college and typically receive funding in excess of $6 million per year on a non-competitive basis from their sponsoring federal agency. As illustrated in a 2018 report by the U.S. Government Accountability Office (GAO), the amount of funding DOD directs to an individual UARC can vary widely. For example, in FY2017 one UARC received $1.2 million in funding while another received $78.7 million.[24]

UARCs are not defined in federal statute. However, DOD has established policies and procedures for their management.[25] The characteristics of UARCs are very similar to FFRDCs. The defining feature of UARCs, like FFRDCs, is the long-term strategic relationship they have with their sponsoring federal agency. This relationship is intended to allow for in-depth knowledge of the agency's research needs, independence and objectivity, freedom from conflicts of interest, access to sensitive information, and the ability to respond quickly to emerging research areas.

The primary differences between UARCs and FFRDCs are that UARCs must be affiliated with a university, must have education as part of their overall mission, and have greater flexibility to compete for public and private R&D contracts.[26] According to GAO, DOD oversight of the department's UARCs differs from its FFRDCs. The DOD military service, agency, or component serving as the primary sponsor of a UARC conducts policy and contract oversight of a UARC, in contrast to conducting active oversight of a DOD FFRDC (i.e., DOD must approve all FFRDC work before it is placed on contract).[27]

Federal Funding of FFRDCs

According to NSF, the federal government reported obligating $141.5 billion on R&D in FY2019.[28] Of this amount, $14.9 billion or 10.5% of the total reported amount was spent on R&D performed by FFRDCs, compared to $43.6 billion (30.8%) performed by industry, $39.6 billion (28.0%) performed by federal agencies (intramural), and $33.4 billion (23.6%) performed by universities and colleges (**Figure 1**). Other nonprofit organizations, state and local governments, and foreign entities performed the remaining $10.1 billion (7.2%) of R&D funded by the federal government in FY2019 (**Figure 1**, see box below for definitions of R&D performers. Of the reported federal funds obligated to FFRDCs in FY2019, 41% was for basic research, 36% was for applied research, and 24% was for development (**Figure 2**).

Figure 3 and **Figure 4** illustrate federal R&D spending trends for FFRDCs from FY1967 to FY2019. **Figure 3** shows that the proportion of total reported federal R&D spending obligated to

[24] U.S. Government Accountability Office, *Defense Science and Technology: Actions Needed to Enhance Use of Laboratory Initiated Research Authority*, GAO-19-64, December 20, 2018, pp. 28-29, Table 1, https://www.gao.gov/products/GAO-19-64.

[25] U.S. Department of Defense, University Affiliated Research Center (UARC) Management Plan, July, 2010, at https://acc.dau.mil/adl/en-US/458427/file/58921/UARC%20%20Mgmt%20Plan-Jun%2023%2010%20FINAL%206811.doc.

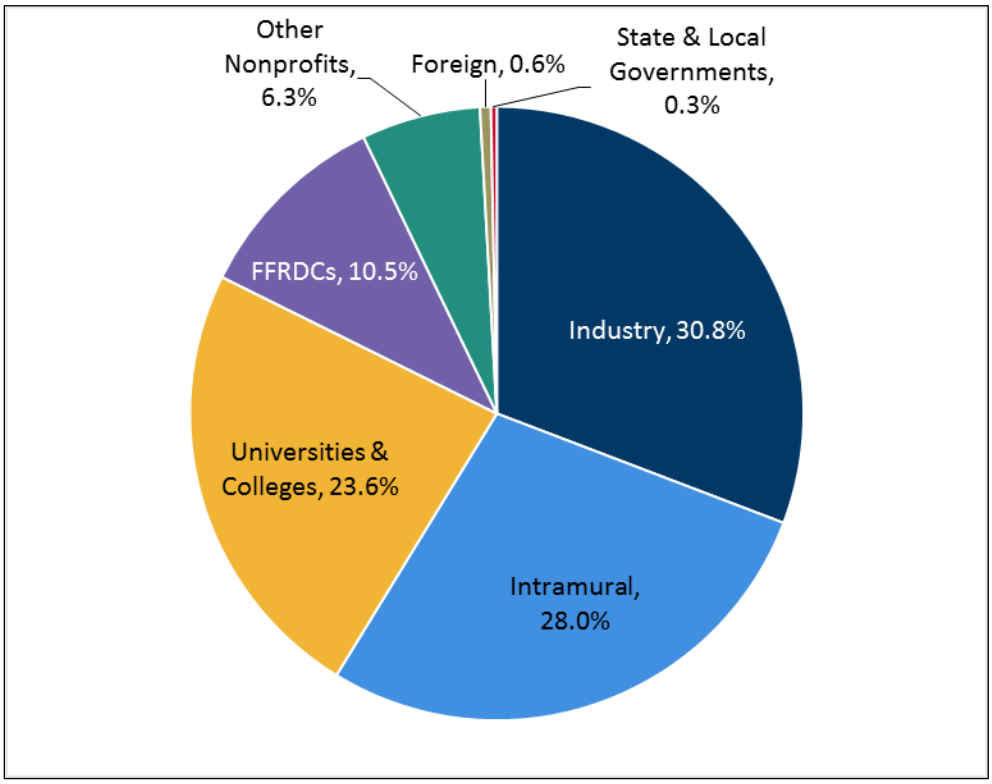
[26] Jill M. Hruby et al., *The Evolution of Federally Funded Research and Development Centers*, Public Interest Report, Federation of American Scientists, Spring 2011, p. 25.

[27] U.S. Government Accountability Office, *Defense Science and Technology: Actions Needed to Enhance Use of Laboratory Initiated Research Authority*, GAO-19-64, December 20, 2018, p. 55, Table 5, https://www.gao.gov/products/GAO-19-64.

[28] National Science Foundation, National Center for Science and Engineering Statistics, *Survey of Federal Funds for Research and Development, Fiscal Years 2018–19*, at https://ncsesdata.nsf.gov/fedfunds/2018/. A total of 32 federal agencies (15 federal departments and 17 independent agencies) reported R&D data to NSF for the survey for FY2018-FY2019. As described by NSF, "some measurement problems are known to exist in the Federal Funds Survey data. Some agencies cannot report the full costs of R&D, the final performer of the R&D, or the R&D plant data." For more information on the survey design, data collection and processing, and survey quality measures, among other areas, see "Survey Description," at https://www.nsf.gov/statistics/srvyfedfunds/#tabs-1&sd.

FFRDCs has varied over time, ranging from a high of 11.6% in FY1983 to a low of 6.4% in FY2008. On average, between FY1967 and FY2019, the federal government reported obligating 9.2% of its federal R&D spending to FFRDCs. In constant dollars, federal funding for FFRDCs grew from $7.69 billion to $14.87 billion from FY1967 to FY2019 (**Figure 4**). This increase represents a compound annual growth rate (CAGR) of 1.25% compared to the CAGR of 0.66% for total reported federal R&D spending over the same period. Federal funding for FFRDCs in FY2019 ($14.87 billion) was 17.1% higher than in FY2018 ($12.70 billion) and represents the largest amount of federal funding for FFRDCs to date. As shown in **Appendix B**, the number of FFRDCs has fluctuated over time, from a high of 74 in FY1969 to a low of 34 in FY1982.

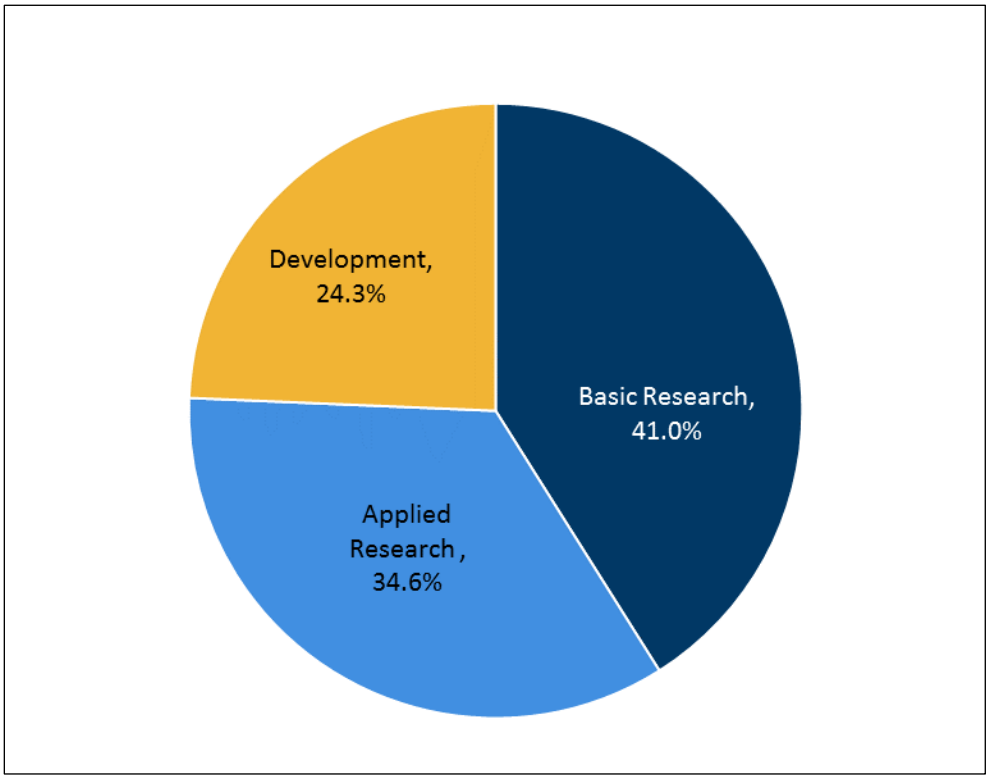
Figure 1. Share of Federal R&D Obligations by R&D Performer, FY2019



Source: CRS analysis of data from National Science Foundation, *Survey of Federal Funds for Research and Development, Fiscal Years 2018–19*, Table 8, https://ncsesdata.nsf.gov/fedfunds/2018/index.html.

Notes: Components may not sum to 100% due to rounding. A total of 32 federal agencies (15 federal departments and 17 independent agencies) reported R&D data to NSF for the survey for FY2018-FY2019. As described by NSF, "some measurement problems are known to exist in the Federal Funds Survey data. Some agencies cannot report the full costs of R&D, the final performer of the R&D, or the R&D plant data." For more information on the survey design, data collection and processing, and survey quality measures, among other areas, see "Survey Description," at https://www.nsf.gov/statistics/srvyfedfunds/#tabs-1&sd.

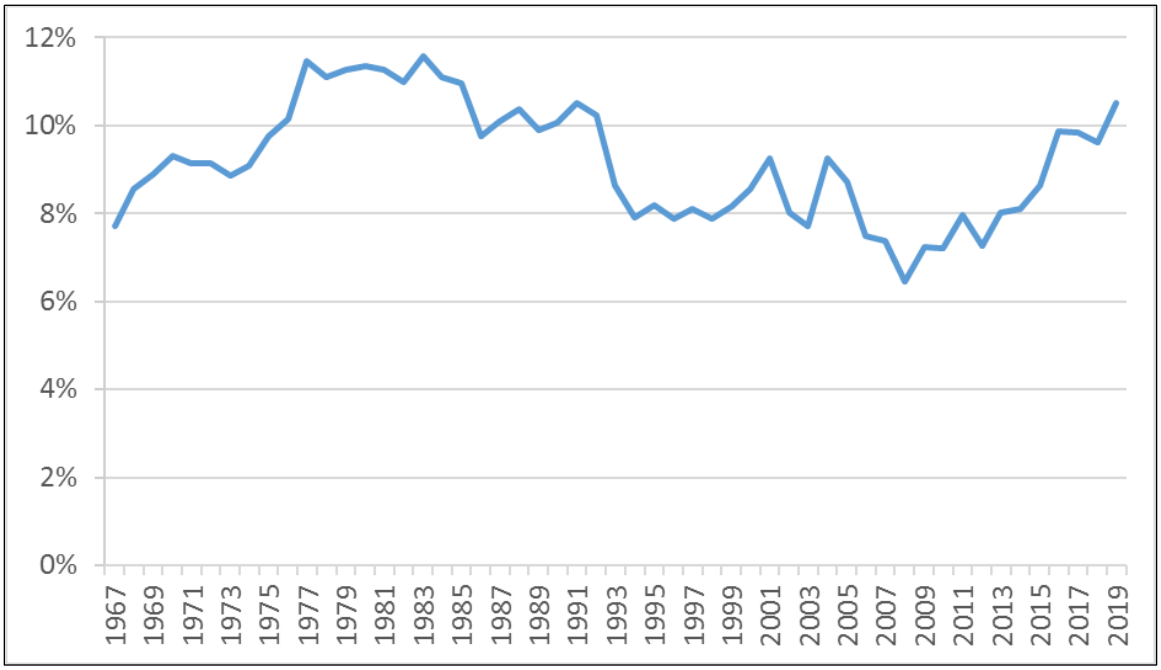
Figure 2. Federal Obligations to FFRDCs by Character of Work, FY2019



Source: CRS analysis of data from National Science Foundation, *Survey of Federal Funds for Research and Development, Fiscal Years 2018–19*, Tables 28, 40, and 52, https://ncsesdata.nsf.gov/fedfunds/2018/index.html.

Notes: Components may not sum to 100% due to rounding. A total of 32 federal agencies (15 federal departments and 17 independent agencies) reported R&D data to NSF for the survey for FY2018-FY2019. As described by NSF, "some measurement problems are known to exist in the Federal Funds Survey data. Some agencies cannot report the full costs of R&D, the final performer of the R&D, or the R&D plant data." For more information on the survey design, data collection and processing, and survey quality measures, among other areas, see "Survey Description," at https://www.nsf.gov/statistics/srvyfedfunds/#tabs-1&sd.

Figure 3. Share of Federal R&D Obligations to FFRDCs, FY1967-FY2019



Source: CRS analysis of data from National Science Foundation, *Survey of Federal Funds for Research and Development, Fiscal Years 2018–19*, Table 116, https://ncsesdata.nsf.gov/fedfunds/2018/index.html.

Notes: As described by NSF, "some measurement problems are known to exist in the Federal Funds Survey data. Some agencies cannot report the full costs of R&D, the final performer of the R&D, or the R&D plant data." For more information on the survey design, data collection and processing, and survey quality measures, among other areas, see "Survey Description," at https://www.nsf.gov/statistics/srvyfedfunds/#tabs-1&sd.

Definitions Associated with Federal R&D Performers[29]

Intramural performers are the agencies of the federal government. R&D is carried out directly by agency personnel.

Extramural performers are organizations outside the federal sector that perform R&D with federal funds under contract, grant, or cooperative agreement. Types of extramural performers:

Businesses or Industrial firms: organizations that may legally distribute net earnings to individuals or to other organizations.

Universities and colleges: institutions of higher education in the United States that engage primarily in providing resident or accredited instruction for a not less than a 2-year program above the secondary school level that is acceptable for full credit toward a bachelor's degree or that provide not less than a 1-year program of training above the secondary school level that prepares students for gainful employment in a recognized occupation.

Other nonprofit institutions: private organizations other than educational institutions whose net earnings do not benefit either private stockholders or individuals and other private organizations organized for the exclusive purpose of turning over their entire net earnings to such nonprofit organizations.

Federally funded research and development centers (FFRDCs): R&D-performing organizations that are exclusively or substantially financed by the federal government and are supported by the federal government either to meet a particular R&D objective or in some instances to provide major facilities at universities for research and associated training purposes. Each center is administered by an industrial firm, a university, or another nonprofit institution.

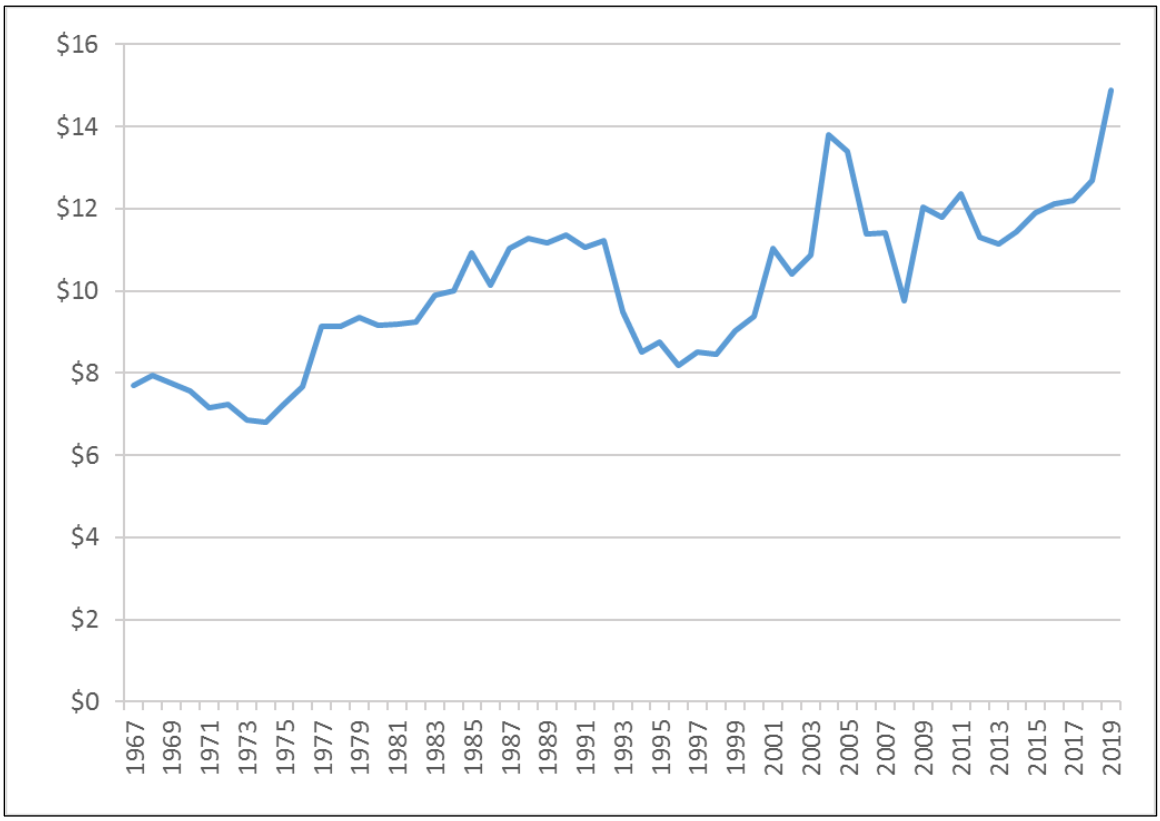
State and local governments: State and local government agencies, excluding state or local universities and colleges, agricultural experiment stations, medical schools, and affiliated hospitals. R&D activities are performed either by the state or local agencies themselves or by other organizations under grants or contracts from such agencies.

Foreign performers: Foreign citizens, organizations, or governments, as well as international organizations performing R&D work abroad financed by the federal government.

[29] National Science Foundation, National Center for Science and Engineering Statistics, *Survey of Federal Funds for Research and Development, Fiscal Years 2017–18*, Technical Notes, at https://ncsesdata.nsf.gov/fedfunds/2017/ffs17-tech-notes.pdf.

Figure 4. Federal R&D Obligations to FFRDCs, FY1967-FY2019

in billions of constant FY2019 dollars



Source: CRS analysis of data from National Science Foundation, *Survey of Federal Funds for Research and Development, Fiscal Years 2018–19*, Table 116, https://ncsesdata.nsf.gov/fedfunds/2018/index.html.

Notes: As described by NSF, "some measurement problems are known to exist in the Federal Funds Survey data. Some agencies cannot report the full costs of R&D, the final performer of the R&D, or the R&D plant data." For more information on the survey design, data collection and processing, and survey quality measures, among other areas, see "Survey Description," at https://www.nsf.gov/statistics/srvyfedfunds/#tabs-1&sd.

Table 1 shows the amount of reported preliminary federal funding obligated to FFRDC in FY2019, the share of total FFRDC funding provided by each agency, and the share of each agency's R&D budget spent at FFRDCs. Three federal agencies—DOE, NASA, and DOD—accounted for nearly 92% of all reported preliminary federal R&D funding obligated to FFRDCs in FY2019. DOE accounted for $8.5 billion (57.0%) of the total $14.9 billion in preliminary FFRDC funding reported for FY2019. This represented 58.0% of DOE's total R&D budget, indicating the central role FFRDCs play in fulfilling the agency's research needs. By comparison, NASA accounted for $3.1 billion (20.9%) of total preliminary FFRDC funding, which represented 20.3% of the agency's R&D budget and DOD accounted for $2.1 billion (14.1%) of the total funding, which represented 3.7% of DOD's R&D budget (**Table 1**).

Similar to DOE, the United States Courts and the NRC relied heavily on FFRDCs to execute their R&D needs in FY2019. The United States Courts spent all of its R&D budget on R&D performed by FFRDCs ($5.9 million) and the NRC obligated 32.9% ($21.3 million) of the agency's R&D budget to FFRDCs (**Table 1**). Other federal agencies spent variable amounts of their agency's estimated FY2019 R&D budget on R&D performed by FFRDCs. For example, HHS spent $673.1 million or 1.7% of its R&D budget, NSF spent $290.8 million or 4.8% of its R&D budget, DOT spent $126.9 million or 10.8% of its R&D budget, DHS spent $64.0 million or 6.8% of its

R&D budget, and the Department of Commerce (DOC) spent $22 million or 1.4% of its R&D budget on R&D performed by FFRDCs (**Table 1**).

Table 1. Preliminary Federal Agency R&D Obligations to FFRDCs, FY2019

dollars in millions

	FFRDC Obligations	% of Total Federal R&D Obligations to FFRDCs	% of Agency R&D Budget to FFRDCs
Department of Energy	$8,470.9	57.0%	58.0%
National Aeronautics and Space Administration	$3,105.7	20.9%	20.3%
Department of Defense	$2,089.9	14.1%	3.7%
Department of Health and Human Services	$673.1	4.5%	1.7%
National Science Foundation	$290.8	2.0%	4.8%
Department of Transportation	$126.9	0.9%	10.8%
Department of Homeland Security	$64.0	0.4%	6.8%
Department of Commerce	$22.0	0.1%	1.4%
Nuclear Regulatory Commission	$21.3	0.1%	32.9%
United States Courts	$5.9	<0.1%	100.0%
Department of Education	$1.1	<0.1%	0.4%
Department of the Interior	$0.1	<0.1%	<0.1%
Total	**$14,876.1**	**100.0%**	**11.0%**

Source: CRS analysis of data from National Science Foundation, *Survey of Federal Funds for Research and Development, Fiscal Years 2018–19*, https://ncsesdata.nsf.gov/fedfunds/2018/index.html.

Notes: As described by NSF, "some measurement problems are known to exist in the Federal Funds Survey data. Some agencies cannot report the full costs of R&D, the final performer of the R&D, or the R&D plant data." For more information on the survey design, data collection and processing, and survey quality measures, among other areas, see "Survey Description," at https://www.nsf.gov/statistics/srvyfedfunds/#tabs-1&sd.

Issues for Congress

FFRDCs have attracted the attention of Congress for decades. Historically, congressional concern focused on the growth of FFRDCs and their cost to the government (see **Appendix B** for the number of FFRDCs from FY1967 to FY2020). In more recent years, Congress has focused on the management and oversight of FFRDCs and their insulation from competition. Many of these concerns remain. The following sections describe some of these issues.

Effectiveness of Oversight and Management

The adequacy of agency oversight and management of FFRDCs is a long-standing congressional concern. Some Members of Congress have repeatedly expressed concern about the ability of federal agencies to control costs and address perceived mismanagement at FFRDCs. For example, in 1992, a Senate subcommittee report indicated "that FFRDCs today operate under an inadequate, inconsistent patchwork of federal cost, accounting and auditing controls, whose

deficiencies have contributed to the wasteful or inappropriate use of millions of federal dollars."[30] In a 2016 hearing examining the mission and management of DOE's FFRDCs, Representative Fred Upton, Chairman of the House Committee on Energy and Commerce, stated,

> DOE's safety, security, and contract management problems span administrations, span Congresses. From my experience, and as our witnesses will explain, improving DOE's performance requires long, sustained attention to ensure sustained improvement in agency performance.[31]

Congressional scrutiny is driven, in part, by a number of high-profile incidents. For example, in 2000, two Los Alamos National Laboratory (LANL) computer hard drives went missing and an employee was accused of planning to sell nuclear information to China.[32] In 2004, the mishandling of classified data and the partial blinding of a student from a laser accident closed LANL for seven months, costing $370 million.[33] Additionally, in 2016, an investigation found that LANL mishandled hazardous waste, and nine LANL workers were injured during routine maintenance of an electrical substation.[34]

Since the early 1990s, the Government Accountability Office (GAO) has designated DOE's contract management as a high-risk area for fraud, waste, abuse, and mismanagement.[35] In 2013, GAO narrowed its high-risk designation to major contracts and projects within DOE's Office of Environmental Management and the National Nuclear Security Administration, which manages three DOE FFRDCs.[36] In 2018, while noting some of the progress made by DOE in addressing its oversight and management challenges, GAO indicated that "challenges remain."[37] And, in a 2019 review of how DOE evaluates the performance of contractors who manage and operate DOE facilities, including FFRDCs, GAO found the following:

> In analyzing DOE's fiscal year 2016 Performance Evaluation Reports (PER), GAO found that these reports provided less information on M&O [management and operating] contractors' cost performance than on contractors' technical and administrative performance. The cost information provided in the PERs often was not detailed, did not indicate the significance of the performance being described, and applied only to specific activities. Further, the information is of limited use for acquisition decision-making, such as deciding whether to extend the length of a contract, because it does not permit an overall assessment of cost performance.[38]

---

[30] Subcommittee on Oversight of Government Management, Committee on Governmental Affairs, U.S. Senate, *Inadequate Federal Oversight of Federally Funded Research and Development Centers*, 102nd Cong., 2nd sess., S.Prt. 102-98, (Washington, DC: GPO 1992), p. iii.

[31] Statement of Chairman Fred Upton, in U.S. Congress, House Committee on Energy and Commerce, Subcommittee on Oversight and Investigations, *DOE for the 21st Century: Science, Environment, and National Security Missions*, hearing, 114th Cong., 2nd sess., February 24, 2016.

[32] Suzanne Struglinski, "DOE: Abraham Announces Los Alamos Contract Will Undergo Competitive Bidding," *Greenwire*, May 1, 2003.

[33] Mary O'Driscoll, "Nuclear Safety: Lawmakers Seek GAO Help in Solving Los Alamos Problems," *Greenwire*, February 21, 2007.

[34] "National Labs: Los Alamos' Mission in Question amid Management Turmoil," *Greenwire*, January 4, 2016.

[35] U.S. Government Accountability Office, *High-Risk Series: An Update*, GAO-15-290, February, 2015, p. 294.

[36] Ibid.

[37] David C. Trimble, Director, Natural Resources and Environment, U.S. Government Accountability Office, Testimony before the Subcommittee on Strategic Forces, Senate Committee Armed Services, *Department of Energy: Continued Actions Needed to Address Management Challenges*, March 14, 2018, pp. 14-21.

[38] U.S. Government Accountability Office, *Department of Energy: Performance Evaluations Could Better Assess Management and Operating Contractor Costs*, GAO-19-5, February 26, 2019, https://www.gao.gov/products/GAO-19-

Since 2002, DOE has been shifting its FFRDC oversight from a transactional model to a systems-based approach that assesses analytical information collected by the FFRDCs through what is known as contractor assurance systems (CAS).[39] Many stakeholders recognize the use of CAS as a positive step to improving DOE oversight.[40] However, in 2013, the National Academy of Public Administration (NAPA) called on DOE to exercise caution as it transitioned to this oversight model.[41] NAPA indicated that the maturity of CAS varies and that DOE needs to verify the ability of an FFRDC's CAS to identify problems before they occur.

In contrast, others view DOE's overall oversight and management activities as burdensome, counterproductive, and a distortion of the FFRDC model.[42] Critics assert that the original benefit of the FFRDC model—flexibility—has been substantially diminished because DOE now micromanages its FFRDCs. According to a 2013 report by the Information Technology and Innovation Foundation, the Center for American Progress, and the Heritage Foundation,

> Decisions that should be made by research teams and lab managers are instead preapproved and double checked by a long and growing chain of command at DOE. There is no better example of this oversight than the hundreds of DOE site-office[43] employees staffed to regulate lab managers and research by proxy. This adds considerable delay and introduces additional costs to routine business decisions.[44]

Some of those concerned about the detrimental effects of increased micromanagement would like to see a return to the original intent of the FFRDC model: a model where the government sets the overall strategic direction and provides the necessary funding and the FFRDC is given the flexibility to determine how to address the identified challenges.[45] Critics indicate that a lack of trust currently exists between DOE and its laboratories and that in order to return to the partnership envisioned by the FFRDC model, this trust needs to be restored. They recommend that DOE provide its FFRDCs with more authority and flexibility, and then hold each FFRDC to a high standard of transparency and accountability.[46] According to the Information Technology and Innovation Foundation, the Center for American Progress, and the Heritage Foundation, if an individual FFRDC does not meet its obligations, corrective actions, including punitive restrictions and possibly the firing of the FFRDC contractor, are valid options, but they assert that the

5.

[39] Transactional oversight is an oversight model that ensures contractor performance by identifying those technical areas, activities, or actions that will be observed, reviewed, or approved by the oversight organization. A systems-based approach, on the other hand, is intended to ensure performance through the implementation of an effective management system that provides high-quality information for decisionmaking. For an example of a DOE contractor assurance system, see https://commons.lbl.gov/download/attachments/77332681/PUB+5520+UC+CAS+Description.pdf.

[40] National Academy of Public Administration, *Positioning DOE's Labs for the Future: A Review of DOE's Management and Oversight of the National Laboratories*, January 2013, p. 47.

[41] Ibid.

[42] Information Technology and Innovation Foundation, Center for American Progress, and the Heritage Foundation, *Turning the Page: Reimagining the National Labs in the 21st Century Innovation Economy*, June 2013, p. 19.

[43] Each DOE FFRDC has a co-located field office staffed by agency employees who supervise the day to day operations of the FFRDC.

[44] Ibid., p. 20.

[45] U.S. Department of Energy, Commission to Review the Effectiveness of the National Energy Laboratories, *Securing America's Future: Realizing the Potential of the Department of Energy's National Laboratories, Volume 2*: Technical Chapters and Appendices, October 28, 2015, p. 15.

[46] Ibid., p. 27.

mistakes of one FFRDC should not result in new regulations and additional oversight for all DOE FFRDCs.[47]

Competition with the Private Sector

Congress and the executive branch have been interested in promoting competition in federal procurement, including the procurement of R&D, for decades. However, federal law explicitly exempts FFRDCs from competitive practices.[48] Historically, critics of this exemption have asserted that it prohibits the federal government from receiving the best possible R&D at the most competitive price.[49] For example, in a 1997 report, the Defense Science Board stated, "the lack of competition for much of the work being done in the FFRDCs is not justified, nor in the long run is it in the best interests of the DOD."[50] Additionally, some critics have pointed out that the R&D capabilities of the private sector have increased dramatically since World War II and the continued use of FFRDCs is in direct opposition to their original intent—to conduct R&D that cannot be done as effectively by the private sector or the federal government.[51] A 2016 report by the Defense Business Board—an advisory committee composed of business leaders and managers—stated,

> Today, the for-profit sector can provide most of the technical services that was, in the past, only available from a FFRDC. However, in many cases there remain sound reasons to give the work to FFRDCs, such as avoiding potential conflicts of interest, access to confidential competitive information or deep historical knowledge and experience not available in for-profit companies.[52]

More recently, critics have focused on the use of FFRDCs for systems engineering and integration (SE&I) services.[53] The Professional Services Council (PSC), the national trade association of the government professional and technical services industry, has asserted that the SE&I capabilities of the private sector are as good as or better than those of FFRDCs.[54] According to PSC, "prior to the 1990s, FFRDCs were often favored over for-profit systems engineering companies on grounds of avoiding potential conflicts of interest."[55] However, PSC also suggested that congressionally initiated reforms through the Weapon System Acquisition Reform Act of 2009 (P.L. 111-23) have resulted in a sizable number of private sector SE&I

---

[47] Information Technology and Innovation Foundation, Center for American Progress, and the Heritage Foundation, *Turning the Page: Reimaging the National Labs in the 21st Century Innovation Economy,* June 2013, p. 24.

[48] The Competition in Contracting Act (CICA) of 1984 (Title VII of P.L. 98-369) directs competition practices in federal contracting. CICA requires the use of "full and open competition" in the procurement of goods and services. However, the CICA also permits the use of noncompetitive procedures in a number of circumstances, including "establishing or maintaining an essential engineering, research, or development capability" provided by an FFRDC.

[49] U.S. General Accounting Office, *Competition: Issues on Establishing and Using Federally Funded Research and Development Centers*, GAO-88-22, March, 1988, p. 8.

[50] U.S. Department of Defense, Defense Science Board, Office of the Under Secretary of Defense for Acquisition and Technology, *Report of the Defense Science Board Task Force on Federally Funded Research and Development Centers (FFRDC) and University Affiliated Research Centers (UARC)*, January, 1997, p. 5.

[51] Professional Services Council, *Federally Funded Research and Development Centers: A Strategic Reassessment for Budget-Constrained Times*, June 5, 2012, pp. 8-9.

[52] Defense Business Board, *Future Models for Federally Funded Research and Development Contracts*, DBB FY17-02, October 2016, p. 6, https://dbb.defense.gov/Portals/35/Documents/Reports/2017/DBB%20FY17-02%20FFRDCs%20Completed%20Study%20(October%202016).pdf.

[53] Ibid., p. 2.

[54] Ibid., p. 4.

[55] Ibid,. p. 9.

companies that are conflict free, independent, and capable of performing the SE&I work currently going to FFRDCs.[56]

In the National Defense Authorization Act for Fiscal Year 2016 (Section 895 of P.L. 114-92), Congress included a provision to address concerns about conflicts of interest and unfair competitive advantages associated with sole-source task orders to entities that provide technical advice on defense programs. Specifically, the provision requires DOD to review and, if necessary, issue policy guidance related to the identification, mitigation, and prevention of potential unfair competitive advantages conferred to technical advisors to acquisition programs. As detailed in the joint explanatory statement accompanying the bill, technical advisors are contractors, FFRDCs, university-affiliated research centers, non-profit entities, and federal laboratories that provide, among other services, systems engineering and technical direction.[57] In carrying out the provision, the joint explanatory statement directs DOD

> To review the efficacy of current conflict-of-interest policies, the use of non-disclosure agreements, the application of appropriate regulations, and decisions to allocate resources through direct award of funds to intramural programs or sole-source task orders to entities that provide technical advice on defense programs versus open and competitive extramural solicitations.[58]

In December 2019, GAO reviewed DOD's use of study and analysis FFRDCs and found that all five of DOD's study and analysis centers had conflict of interest policies and practices in line with the FAR and DOD guidance related to FFRDCs.[59]

It is less clear, however, if the private sector could fully address the work being performed by FFRDCs categorized as R&D laboratories. According to PSC, FFRDCs "maintain laboratories and specialized test and evaluation facilities beyond those available to the government and its for-profit contractors."[60] Additionally, proponents assert that FFRDCs "occupy a key role in the nation's S&T [science and technology] community that cannot be carried out solely by academic institutions or the business sector."[61] FFRDCs are widely seen as contributing to U.S. technological and economic leadership.

Mission Creep

The diversification of FFDRC activities or "mission creep" is an issue closely related to concerns about competition with the private sector. A poorly defined mission or scope may make it more difficult to determine what R&D tasks are appropriate for an FFRDC to perform and what tasks are better left to the private sector. Concerns over mission creep are associated not only with the broadening of FFRDC activities into new fields, but also with the broadening of FFRDC clients (e.g., work for other agencies). Some analysts have asserted that diversification of FFRDC activities is contrary to the intent of FFRDCs—to serve a special R&D need—and an ineffective

[56] Ibid., pp. 9-10.

[57] Joint Explanatory Statement on S. 1356 published in Congressional Record, November 5, 2015, p. H7989.

[58] Ibid.

[59] U.S. Government Accountability Office, *Federal Research: DOD's Use of Study and Analysis Centers*, GAO-20-31, December 9, 2019, pp. 28-29, https://www.gao.gov/products/GAO-20-31.

[60] Professional Services Council, *Federally Funded Research and Development Centers: A Strategic Reassessment for Budget-Constrained Times*, June 5, 2012, p. 4.

[61] U.S. Department of Energy, Commission to Review the Effectiveness of the National Energy Laboratories, "Securing America's Future: Realizing the Potential of the Department of Energy's National Laboratories," Volume 1: Executive Report, October 28, 2015, p. 7.

means for accomplishing the federal agency's mission.[62] In 1995, a task force examining the future of the DOE national laboratories stated that applying the technical competencies of the national laboratories to new problem areas needed to be carefully managed.[63] Specifically, the task force said such activities

> should not be a license to expand into areas of science and technology which already are being addressed effectively or more appropriately by other Research and Development (R&D) performers in government, academia and the private sector.[64]

Agencies have approached mission creep concerns in different ways. DOE has placed limits on the amount of work its FFRDCs can perform for other agencies. Specifically, if the work for other agencies and non-governmental entities in a DOE Office of Science FFRDC is 20% above the FFRDC's operating budget, then DOE requires an in-depth review prior to approving the work.[65] Such a review is intended to ensure the work that DOE FFRDCs are performing for other entities will not impede its ability to meet DOE's research needs. However, in a 2013 report, GAO indicated that DOE is not consistently fulfilling agency requirements—project approval, cost recovery, or program review—to ensure its work for others program is not negatively affecting the laboratories' mission.[66]

In regards to DOD, Congress has included language each year since 1993 in the defense appropriations bill that prohibits DOD from establishing new FFRDCs.[67] Congress has also placed an annual limit on the number of Staff Years of Technical Effort (STE) that DOD FFRDCs can use to perform work for the agency.[68] STE is a cap on personnel time which translates into a cap on funding levels for each FFRDC. DOD allocates a portion of STE to each of its FFRDCs. Limiting the personnel time available to each DOD FFRDC is believed to drive prioritization of needs and provide greater assurance that the work being performed by FFRDCs is appropriate in scope.[69] As noted by the Defense Business Board, the STE limitation does not apply to work that DOD FFRDCs perform for other agencies and "it is not clear how much rigor is applied to the [STE] allocation process."[70]

In general, according to GAO, federal agency approval of annual FFRDC R&D plans should ensure activities remain within the scope, mission, and purpose of the FFRDC.[71] Additionally, the

---

[62] Letter from Stan Soloway, President and Chief Executive Officer of Professional Services Council, to Dr. Reginald Brothers, Under Secretary for Science and Technology, U.S. Department of Homeland Security, at http://www.pscouncil.org/PolicyIssues/GovernmentCompetition/FFRDCCompetition/Letter_to_DHS_on_HSOAC_FFRDC.aspx.

[63] U.S. Department of Energy, Secretary of Energy Advisory Board, Report of the Taskforce on Alternative Futures for the Department of Energy Laboratories, *Alternative Futures for the Department of Energy Laboratories*, February, 1995, at, http://www2.lbl.gov/LBL-PID/Galvin-Report/index.html.

[64] Ibid.

[65] Ibid., p. 22.

[66] U.S. Government Accountability Office, *National Laboratories: DOE Needs to Improve Oversight of Work Performed for Non-DOE Entities*, GAO-14-78, October, 2012, p. 25.

[67] See, for example, Section 8025 of P.L. 116-93.

[68] Ibid.

[69] U.S. Government Accountability Office, *Federal Research: Opportunities Exist to Improve the Management and Oversight of Federally Funded Research and Development Centers*, GAO-09-15, October, 2008, p. 16.

[70] Defense Business Board, Future Models for Federally Funded Research and Development Contracts, DBB FY17-02, October 2016, p. 8, https://dbb.defense.gov/Portals/35/Documents/Reports/2017/DBB%20FY17-02%20FFRDCs%20Completed%20Study%20(October%202016).pdf.

[71] U.S. Government Accountability Office, Federal Research: Opportunities Exist to Improve the Management and

Defense Business Board recommended that DOD conduct periodic in-depth reviews of its FFRDCs every seven to ten years using independent experts to review an FFRDC's mission and priorities; assess the quality of an FFRDC's work; and assess the relevance of their strategic or technical expertise.[72]

Competition of FFRDC Contracts

A hallmark of FFRDCs is the long-term relationship each has with its sponsoring agency. A long-term relationship is believed to provide stability and continuity and is considered central to attracting and retaining scientific and technical expertise. Many FFRDCs have been managed by the same contractor since they were created. For example, Associated Universities, Inc. has operated NSF's National Radio Astronomy Observatory since 1956; RAND Corporation has operated DOD's Project Air Force since 1946; and MITRE Corporation has operated FAA's Center for Aviation System Development since 1990. However, some Members of Congress, GAO, and others have criticized the use of noncompetitive procedures for FFRDC contracts.[73] These critics view competition as the best way to decrease costs and increase quality. For example, in 2003, a report by the Blue Ribbon Commission on the Use of Competitive Procedures for the Department of Energy Labs found that "competition imposes discipline and can elicit quality performance and efficient operation in ways simply not inspired by oversight alone."[74]

DOE has shifted from a position of not regularly conducting full and open competitions for its FFRDCs to routinely subjecting its FFRDCs to competition. Congressional action spurred this shift. Specifically, between FY1998 and FY2009 congressional appropriations acts mandated the use of competition for all DOE FFRDC contracts unless the Secretary of Energy granted a waiver to competition and provided the appropriations committees with a detailed justification for the waiver.[75]

Annual appropriations language was not included after FY2009 because on December 22, 2009, the Secretary of Energy released a policy on the agency's use of competition for the management and operation of its FFRDCs.[76] The policy states,

> DOE does not default to a posture of determining *a priori* either that the Department will conduct competitions for all its M&O contracts, or that it will extend all these contracts. DOE recognizes a preference for full and open competition, and exercises, on a case-by-case basis, the authorities available to the Secretary.

Oversight of Federally Funded Research and Development Centers, GAO-09-15, October, 2008, p. 15.

[72] Defense Business Board, Future Models for Federally Funded Research and Development Contracts, DBB FY17-02, October 2016, p. 9, https://dbb.defense.gov/Portals/35/Documents/Reports/2017/DBB%20FY17-02%20FFRDCs%20Completed%20Study%20(October%202016).pdf.

[73] See, for example, Subcommittee on Oversight of Government Management, Committee on Governmental Affairs, U.S. Senate, *Inadequate Federal Oversight of Federally Funded Research and Development Centers*, 102nd Cong., 2nd sess., S.Prt. 102-98 (Washington, DC: GPO 1992), p. 31.

[74] U.S. Department of Energy, Report of the Blue Ribbon Commission on the Use of Competitive Procedures for the Department of Energy Labs, *Competing the Management and Operations Contracts for DOE's National Laboratories*, November 2003, p. 10.

[75] See, for example, Section 301 of the Energy and Water Development Appropriations Act, 2002, P.L. 107-66.

[76] U.S. Department of Energy, *Policy Regarding the Competition of Contracts to Manage and Operate Its National Laboratories*, December 22, 2009, at, http://science.energy.gov/~/media/lp/pdf/management-and-operating-contracts/DOE_Policy_Extension_or_Competition_of_Contracts_for_National_Labs_2009-12-22.pdf.

According to DOE, the agency generally uses full and open competition under the following circumstances: when the performance of an FFRDC operator is viewed as unsatisfactory; when the potential for improved costs or technical performance has been identified; when viable alternatives exist in the marketplace; or when the agency decides to change the focus or mission of an FFRDC.[77] In 2018, DOE awarded a new contract to Triad National Security, LLC—a partnership between Battelle Memorial Institute, the Texas A&M University System, and the Regents of the University of California—for the management and operation of Los Alamos National Laboratory. The new contract was awarded due to concerns with the performance of the previous contractor, which included health and safety issues.[78] Media reports, however, question the ability of Triad National Security to make significant improvements as one of the entities involved in the partnership, the University of California, was part of the previous contract management team.[79]

Although competition is widely seen as an important tool for increasing performance and efficiency, some experts have asserted that there are downsides associated with the competition of FFRDC contracts.[80] Specifically, critics view competition of existing FFRDCs as disruptive, costly, and harmful to FFRDC productivity.[81] According to DOE, the time to conduct an FFRDC competition is approximately 18 months and it is estimated to cost a contractor preparing a bid between $3 million and $5 million.[82] In describing its experiences with increased competition, DOE has stated,

> although some efficiencies or improved contractual agreements have been made possible as a result of the new contracts the overall performance of the new contractors has in most cases not surpassed that of the old, and it is arguable that what improvements have been observed could have been achieved even in the absence of competition.[83]

In 2008, GAO found that while most agencies required full and open competition for their FFRDC contracts, DOD continued to award noncompetitive or sole-source contracts to its FFRDCs.[84] However, GAO also found that in response to criticism DOD began conducting more detailed and comprehensive reviews before renewing its FFRDC contracts.[85] Additionally, a 2009 report by NASA's Office of Inspector General (OIG) found that the agency did not conduct an assessment of possible competitors, as required by the FAR, for operation of the Jet Propulsion

---

[77] Ibid.

[78] U.S. Government Accountability Office, National Nuclear Security Administration Contracting: Review of the NNSA Report on the Los Alamos National Laboratory Contract Competition, GAO-20-292R, January 2020, https://www.gao.gov/products/GAO-20-292R.

[79] Rebecca Moss, "The Government's New Contractor to Run Los Alamos Includes the Same Manager It Effectively Fired for Safety Problems," *ProPublica*, June 8, 2018, https://www.propublica.org/article/new-contractor-los-alamos-university-of-california-safety-problems.

[80] U.S. Department of Energy, *Report of the Blue Ribbon Commission on the Use of Competitive Procedures for the Department of Energy Labs: Competing the Management and Operations Contracts for DOE's National Laboratories*, November 2003, p. 14.

[81] Ibid.

[82] U.S. Department of Energy, *Policy Regarding the Competition of Contracts to Manage and Operate Its National Laboratories*, December 22, 2009, at, http://science.energy.gov/~/media/lp/pdf/management-and-operating-contracts/DOE_Policy_Extension_or_Competition_of_Contracts_for_National_Labs_2009-12-22.pdf.

[83] Ibid.

[84] The Competition in Contracting Act of 1984 (P.L. 98-369) includes a statutory exemption for FFRDCs.

U.S. Government Accountability Office, *Federal Research: Opportunities Exist to Improve the Management and Oversight of Federally Funded Research and Development Centers*, GAO-09-15, October, 2008, p. 9.

[85] Ibid., p. 29.

Laboratory.[86] According to the NASA OIG, without performing the assessment NASA could not determine if it was getting the best value for the operation of its FFRDC.[87]

Condition of FFRDC Infrastructure

Similar to other government-owned laboratories, the facilities and infrastructure of many FFRDCs are decades old. According to GAO, DOD FFRDC officials cited aging facilities and equipment as a hindrance to research and development efforts. For example, officials from the Massachusetts Institute of Technology—the contractor and administrator of Lincoln Laboratory—indicated that some of the facilities "were not structurally designed for modern research and have relatively poor vibration isolation, resulting in inefficient workarounds or work that could not be performed."[88]

In a recent report, the Inspector General of the Department of Energy listed infrastructure modernization as one of DOE's top management challenges, stating,

> Facilities and infrastructure can have a substantial impact on laboratory research and operations in a variety of ways. For instance, poor conditions in laboratory facilities and infrastructure can lead to inadequate functionality in mission performance; negative effects on the environment, safety, and health of the site; higher maintenance costs; and problems with recruiting and retaining high-quality scientists and engineers.[89]

Furthermore, a 2017 report on the state of DOE's national labs, indicates that despite investment by DOE "the condition of a large percentage of the infrastructure is substandard or inadequate for the mission as a result of more than five decades of aging, deterioration, and insufficient funding to keep pace with needed improvements."[90]

According to GAO, NASA's Inspector General has also identified aging infrastructure and facilities as a management challenge for the agency, including for NASA's FFRDC—the Jet Propulsion Laboratory (JPL)—where more than 50% of JPL's facilities are more than 50 years old.[91]

---

[86] Office of Inspector General, National Aeronautics and Space Administration, *NASA Should Reconsider the Award Evaluation Process and Contract Type for the Operation of the Jet Propulsion Laboratory*, Report No. IG-09-022-R, September 25, 2009, p. iii.

[87] Ibid.

[88] U.S. Government Accountability Office, Defense Science and Technology: Actions Needed to Enhance Use of Laboratory Initiated Research Authority, GAO-19-64, December 20, 2018, p. 34, https://www.gao.gov/products/GAO-19-64.

[89] Office of Inspector General, U.S. Department of Energy, *Management Challenges at the Department of Energy - Fiscal Year 2020*, DOE-OIG-20-09, November 15, 2019, p. 19, https://www.energy.gov/ig/downloads/special-report-doe-oig-20-09.

[90] U.S. Department of Energy, *Annual Report on the State of the DOE National Laboratories*, January 2017, p. 87, https://www.energy.gov/sites/prod/files/2017/02/f34/DOE%20State%20of%20the%20National%20Labs%20Report%2002132017.pdf.

[91] U.S. Government Accountability Office, Defense Science and Technology: Actions Needed to Enhance Use of Laboratory Initiated Research Authority, GAO-19-64, December 20, 2018, p. 44, https://www.gao.gov/products/GAO-19-64.

Appendix A. List of Federally Funded Research and Development Centers, as of March 2020

Sponsoring Agency	Name of FFRDC	Activity Type	Contractor
Department of Defense	Aerospace Federally Funded Research and Development Center	Systems Engineering and Integration Center	The Aerospace Corporation
	Arroyo Center	Study and Analysis Center	RAND Corp.
	National Security Engineering Center	Systems Engineering and Integration Center	MITRE Corp.
	Center for Naval Analyses	Study and Analysis Center	The CNA Corporation
	Center for Communications and Computing	R&D Laboratory	Institute for Defense Analyses
	Lincoln Laboratory	R&D Laboratory	Massachusetts Institute of Technology
	National Defense Research Institute	Study and Analysis Center	RAND Corp.
	Project Air Force	Study and Analysis Center	RAND Corp.
	Software Engineering Institute	R&D Laboratory	Carnegie Mellon University
	Systems and Analyses Center	Study and Analysis Center	Institute for Defense Analyses
Department of Energy	Ames Laboratory	R&D Laboratory	Iowa State University
	Argonne National Laboratory	R&D Laboratory	UChicago Argonne, LLC
	Brookhaven National Laboratory	R&D Laboratory	Brookhaven Science Associates, LLC

Sponsoring Agency	Name of FFRDC	Activity Type	Contractor
	Fermi National Accelerator Laboratory	R&D Laboratory	Fermi Research Alliance, LLC
	Idaho National Laboratory	R&D Laboratory	Battelle Energy Alliance, LLC
	Lawrence Berkeley National Laboratory	R&D Laboratory	University of California
	Lawrence Livermore National Laboratory	R&D Laboratory	Lawrence Livermore National Security, LLC
	Los Alamos National Laboratory	R&D Laboratory	Triad National Security, LLC
	National Renewable Energy Laboratory	R&D Laboratory	Alliance for Sustainable Energy, LLC
	Oak Ridge National Laboratory	R&D Laboratory	UT-Battelle, LLC
	Pacific Northwest National Laboratory	R&D Laboratory	Battelle Memorial Institute
	Princeton Plasma Physics Laboratory	R&D Laboratory	Princeton University
	Sandia National Laboratories	R&D Laboratory	National Technology and Engineering Solutions of Sandia, LLC
	Savannah River National Laboratory	R&D Laboratory	Savannah River Nuclear Solutions, LLC
	SLAC National Accelerator Laboratory	R&D Laboratory	Stanford University
	Thomas Jefferson National Accelerator Facility	R&D Laboratory	Jefferson Science Associates, LLC
Department of Health and Human Services	CMS Alliance to Modernize Healthcare	Study and Analysis Center	MITRE Corp.
	Frederick National Laboratory for Cancer Research	R&D Laboratory	Leidos Biomedical Research, Inc.
Department of Homeland Security	Homeland Security Operational Analysis Center	Study and Analysis Center	RAND Corp.

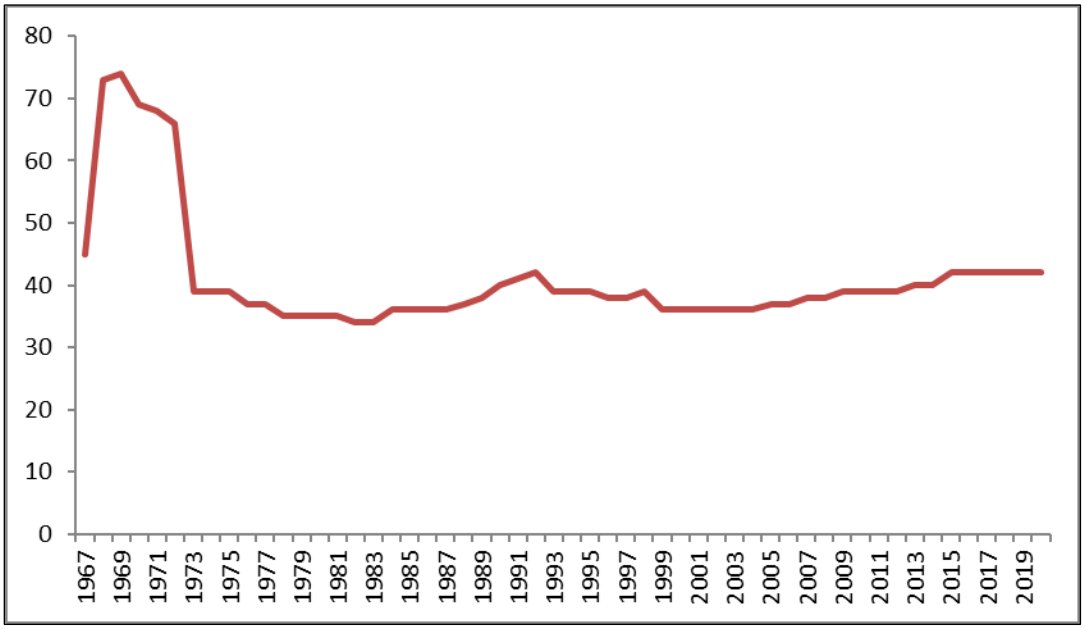
Sponsoring Agency	Name of FFRDC	Activity Type	Contractor
	Homeland Security Systems Engineering and Development Institute	Systems Engineering and Integration Center	MITRE Corp.
	National Biodefense Analysis and Countermeasures Center	Study and Analysis Center	Battelle National Biodefense Institute
Department of Transportation	Center for Advanced Aviation System Development	R&D Laboratory	MITRE Corp.
Department of the Treasury, Department of Veterans Affairs, and the Social Security Administration	Center for Enterprise Modernization	Systems Engineering and Integration Center	MITRE Corp.
National Aeronautics and Space Administration	Jet Propulsion Laboratory	R&D Laboratory	California Institute of Technology
National Institute of Standards and Technology	National Cybersecurity Center of Excellence	Systems Engineering and Integration Center	MITRE Corp.
National Science Foundation	National Center for Atmospheric Research	R&D Laboratory	University Corporation for Atmospheric Research
	National Optical Astronomy Observatory	R&D Laboratory	Association of Universities for Research in Astronomy, Inc.
	National Radio Astronomy Observatory	R&D Laboratory	Associated Universities, Inc.
	National Solar Observatory	R&D Laboratory	Association of Universities for Research in Astronomy, Inc.
	Science and Technology Policy Institute	Study and Analysis Center	Institute for Defense Analyses
Nuclear Regulatory Commission	Center for Nuclear Waste Regulatory Analyses	Study and Analysis Center	Southwest Research Institute

Sponsoring Agency	Name of FFRDC	Activity Type	Contractor
United States Courts	Judiciary Engineering and Modernization Center	Systems Engineering and Integration Center	MITRE Corp.

Source: National Science Foundation, *Master List of Federally Funded R&D Centers,* at http://www.nsf.gov/statistics/ffrdclist/ and CRS analysis of data from National Science Foundation, *Survey of Federal Funds for Research and Development*, *Fiscal Years 2018–19*, Table 13, https://ncsesdata.nsf.gov/fedfunds/2018/index.html.

Appendix B. Number of FFRDCs, FY1967–FY2020

Figure B-1. Number of FFRDCs by Fiscal Year, 1967-2020



Source: CRS generated figure. Data from U.S. Congress, Office of Technology Assessment, A History of the Department of Defense Federally Funded Research and Development Centers, OTA-BP-ISS-157 (Washington, DC: U.S. Government Printing Office, June 1995), pp. 51-52; and National Science Foundation, Master List of Federally Funded R&D Centers, at http://www.nsf.gov/statistics/ffrdclist/.

Author Information

Marcy E. Gallo
Analyst in Science and Technology Policy

Disclaimer

This document was prepared by the Congressional Research Service (CRS). CRS serves as nonpartisan shared staff to congressional committees and Members of Congress. It operates solely at the behest of and under the direction of Congress. Information in a CRS Report should not be relied upon for purposes other than public understanding of information that has been provided by CRS to Members of Congress in connection with CRS's institutional role. CRS Reports, as a work of the United States Government, are not subject to copyright protection in the United States. Any CRS Report may be reproduced and distributed in its entirety without permission from CRS. However, as a CRS Report may include copyrighted images or material from a third party, you may need to obtain the permission of the copyright holder if you wish to copy or otherwise use copyrighted material.