

## Federal Funding for R&D and R&D Plant to Drop in FY 1996; Department of Defense Survey Data Expanded

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*The Department of Defense's funding for advanced technology and major systems development are expected to decrease by 17 percent and 2 percent, respectively, in FY 1996.*

Estimated Federal funding for research and development (R&D) and R&D plant, as reported by Federal agencies during the period March through October 1995, is expected to decrease 3 percent to \$71 billion in fiscal year (FY) 1996. Contributing to this decline is a 30-percent drop in R&D plant obligations (to \$2 billion) and a 4-percent decrease in development funding (to \$41 billion). Research spending (including basic and applied research) is expected to increase 2 percent (to \$28 billion). After adjusting for inflation, Federal obligations for R&D and R&D plant are expected to decline 5 percent. The estimated obligations reported in this Data Brief are subject to change as Federal agencies' budgets are updated to reflect approved programs. The statistics presented here are derived from the National Science Foundation's (NSF's) Annual Survey of Federal Funds for R&D.

### DOD's Development Funding

As indicated by the recent National Academy Press report, *Allocating Federal Funds for Science and Technology* (Washington, DC, 1995), there is considerable interest in differentiating between that part of the Federal R&D budget which supports "science and key enabling technologies" (including for military and nondefense applications) and that which primarily concerns "testing and evaluation of large technical systems prior to production" (of mostly defense-related systems). To better understand the component pieces of Federal R&D funding and to allow a closer look at the funding activity of the sixteen agencies within the Department of Defense (DOD) that report to the Federal Funds Survey, NSF now collects from DOD development dollars in two categories, ad-

vanced technology development and major systems development.

DOD is expected to provide \$26 billion (87 percent of its total development obligations) toward major systems development, which represents a projected 2-percent drop in FY 1996 (Table 1). Combined, Air Force, Navy, Army's Military Functions component, and the

**Table 1. Federal Obligations for Development by Agencies in DOD: Fiscal Years 1994-1996**

Agencies	FY 1994 Actual	FY 1995 Estimate	FY 1996 Estimate	Percentage Change FYs 95-96
(Millions of current dollars)				
Total DOD				
Basic Research...	1,222	1,282	1,196	-6.7
Applied Research...	3,040	3,169	2,949	-6.9
Development 1/...	30,304	30,973	29,561	-4.6
Advanced Tech...	4,461	4,496	3,725	-17.1
Major Systems...	25,812	26,451	25,811	-2.4
Army				
Development.....	4,721	4,693	3,864	-17.7
Advanced Tech...	1,187	1,087	578	-46.8
Major Systems...	3,514	3,584	3,262	-9.0
Navy				
Development.....	8,082	8,323	7,539	-9.4
Advanced Tech...	412	592	502	-15.2
Major Systems...	7,670	7,731	7,037	-9.0
Air Force				
Development.....	11,713	11,871	12,369	4.2
Advanced Tech...	448	456	495	8.6
Major Systems...	11,265	11,415	11,874	4.0
Total Defense Agencies				
Development.....	5,544	5,839	5,514	-5.6
Advanced Tech...	2,414	2,360	2,150	-8.9
Major Systems...	3,120	3,475	3,362	-3.3

1/ DOD development does not equal the sum of the advanced technology and major systems detail because some DOD agencies could not break down development into these two categories.

SOURCE: NSF/SRS, Survey of Federal Funds for Research and Development: Fiscal Years 1994, 1995, and 1996

### Electronic Dissemination

SRS data are available through the World Wide Web (<http://www.nsf.gov/sbe/srs/stats.htm>) and also through STIS, NSF's online Science and Technology Information System, described in NSF flyer 95-64, "Getting NSF Information and Publications." For a paper copy of the flyer, call 703-306-1130. For an electronic copy of the *STIS User's Guide*, send an e-mail with the phrase "get NSF 9410.TXT" to [stisserv@nsf.gov](mailto:stisserv@nsf.gov). For NSF's Telephonic Device for the Deaf, dial 703-306-0090.

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Ballistic Missile Defense Organization (BMDO) is expected to account for \$24 billion (95 percent) of the major systems development obligations. Three of these four top funders are expecting decreases in major systems development between FY 1995 and FY 1996 - Army and Navy are each expected to decline by 9 percent and BMDO is slated to drop by 2 percent. Air Force will increase its funding about \$460 million (4 percent).

DOD's advanced technology development is expected to decrease \$0.8 billion (17 percent to \$3.7 billion) in FY 1996. (Adding in basic and applied research support, DOD's total science and technology R&D budget would decrease 12 percent, from \$8.9 billion to \$7.9 billion in FY 1996.) Advanced technology is expected to comprise all of the estimated FY 1996 development funding at the Defense Logistics Agency (DLA) (\$30 million) and the Defense Nuclear Agency (DNA) (\$34 million) and nearly all (\$1.7 billion or 98 percent) at the Advanced Research Projects Agency (ARPA whose name was recently changed back to DARPA). However, each of these agencies is expected to report a modest increase in funding for advanced technology development between FY 1995 and FY 1996—DNA up by \$4 million, DLA up by \$3 million, and ARPA up by \$2 million. Six of the 13 Defense agencies project no plans for advanced technology funding, while the others (excluding ARPA) expect obligations ranging from \$30 million at DLA to \$280 million at Washington Headquarters Services (WHS). (For this survey cycle, the Army Corps of Engineers was unable to breakout the Corps' \$23 million in development funding.)

ARPA is expected to account for 46 percent of DOD's estimated FY 1996 total advanced technology development funds, compared with its substantially smaller 8-percent share of the DOD R&D and R&D plant total. The largest expected increase of advanced technology funding is expected to occur at Air Force, increasing 9 percent (\$39 million). Nearly half of the projected decrease of advanced technology dollars is expected to occur at Army, dropping from \$1 billion to \$0.6 billion (down 47 percent). The second largest decrease is projected for WHS, which expects a decline of \$180 million (down 39 percent) from its FY 1995 funding level.

### Agency Total Funding Shares

Seven Federal agencies, out of the 32 that report to the R&D survey, are expected to account for 92 percent (\$66 billion) of total Federal funding for R&D and R&D plant in FY 1996 (Table 2). The Department of Defense (DOD) will still comprise the largest share (48 percent), even though its funding is expected to decrease 5 percent from FY 1995 to FY 1996. Contributing to DOD's drop in overall R&D funding are the Army (19 percent decrease), Navy (9 percent decrease), and combined Defense agencies (5 percent decrease). Funding from the Department of Health and Human Services (HHS) will comprise the second largest share (17 percent), increasing by 1 percent in FY 1996. Most of the HHS amount is from its National Institutes of Health for support of the life sciences. The other top funding agencies are projected to be the National Aeronautics and Space Administration (NASA) (12 percent of the FY 1996

**Table 2. Federal Obligations for R&D and R&D Plant: Fiscal Years 1990-1996**

(Millions of current dollars)

Agencies	FY 1990 Actual	FY 1991 Actual	FY 1992 Actual	FY 1993 Actual	FY 1994 Actual	FY 1995 Estimate	FY 1996 Estimate	Current % Change FYs 90-96	Constant % Change FYs 90-96
Total.....	65,831	64,148	68,577	70,415	69,427	73,029	70,906	1.2	-1.3
DOD.....	37,756	32,561	36,526	36,221	34,788	35,573	33,857	-1.8	-4.2
HHS.....	8,513	9,842	9,085	10,499	11,142	11,826	11,989	5.9	3.2
NASA.....	7,060	8,004	8,475	8,769	8,812	9,441	8,499	3.1	0.6
DOE.....	6,547	7,203	7,493	7,724	6,960	7,236	7,770	2.9	0.3
NSF.....	1,729	1,945	1,970	2,012	2,212	2,450	2,540	6.6	4.0
USDA.....	1,211	1,381	1,492	1,470	1,525	1,555	1,476	3.4	0.8
DOC.....	454	505	672	682	857	1,552	1,395	20.6	17.6
Other.....	2,562	2,707	2,864	3,038	3,131	3,396	3,380	4.7	2.1

SOURCE: NSF/SRS, Survey of Federal Funds for Research and Development: Fiscal Years 1994, 1995, and 1996

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Federal R&D and R&D plant total), the Department of Energy (DOE) (11 percent), NSF (4 percent), the Department of Agriculture (USDA) (2 percent), and the Department of Commerce (DOC) (nearly 2 percent). R&D and R&D plant funding is projected to decline at NASA, DOC, and USDA in FY 1996, whereas that from DOE and NSF is slated to increase.

**R&D Growth in the 1990s**

Of the seven major R&D funding agencies, DOC projects show the largest R&D and R&D plant funding annual growth rate—21 percent (18 percent in constant 1987 dollars)—from FY 1990 to FY 1996. DOC’s growth reflects the rapid increases in funding at its National Institute of Standards and Technology. DOC is followed by NSF with a 7-percent growth rate (4 percent in constant dollars during the same period). R&D and R&D plant funding from HHS is expected to average 6-percent growth per year (3 percent in constant dollars) between FY 1990 and FY 1996. DOD’s obligations will drop 1 percent annually. In constant dollars, its funding will decrease at an estimated annualized rate of 4 percent over this six-year period.

**Funding by Character of Work**

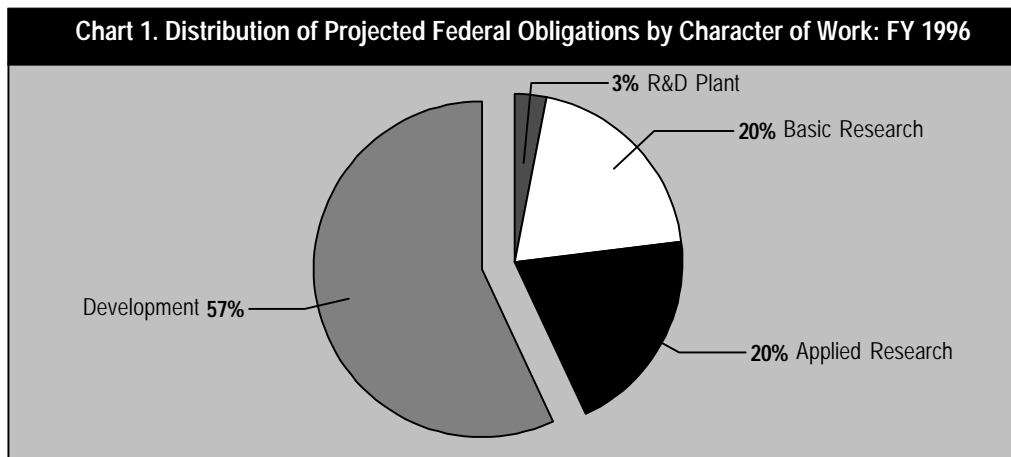
In FY 1996, basic research and applied research are each expected to comprise about 20 percent (\$14 billion) of the total estimated Federal funding for R&D and R&D plant (Chart 1). Funding for basic research is projected to increase about \$0.5 billion (3.5

percent) in FY 1996, and that for applied research will not change. Between FY 1990 and FY 1996, research funding is expected to have an average annual growth of 5 percent, which in constant dollars would be a 2-percent rate of increase. Applied research is expected to increase at an estimated 6-percent growth rate (3 percent in constant dollars) between FY 1990 and FY 1996, while basic research is expected to grow about 4 percent per year (1 percent in constant dollars). Funds for development and R&D plant are slated to decrease by 4 percent and 30 percent, respectively, from FY 1995 to FY 1996. Although development will represent 57 percent of the total R&D and R&D plant, its funding is expected to drop at a rate of 1 percent (3 percent in constant dollars) between 1990 and 1996.

**Funding by Fields of Science and Engineering**

Seven of the eight fields of science and engineering identified in the survey are expected to show an increase in combined basic and applied research funding between FY 1990 and FY 1996 (Chart 2). Only the environmental sciences are expected to drop—by one percent (3 percent in constant dollars)—between FY 1990 and FY 1996. Average annual growth in research support is projected to range from 0.3 percent (down 2 percent in constant dollars) for engineering, to 11 percent (8 percent in con-

*Research accounts for an estimated 40 percent of the FY 1996 Federal R&D and R&D plant total, up considerably from its 33-percent share in FY 1990.*



SOURCE: NSF/SRS, Survey of Federal Funds for Research and Development: Fiscal Years 1994, 1995, and 1996

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stant dollars) for mathematics and computer sciences. In FY 1996, life sciences is expected to continue to have the greatest share of the funding and is projected to comprise an estimated 41 percent of total Federal research dollars. The physical sciences will again have the second largest share, accounting for 22 percent of the total research. Life and physical sciences plus engineering (the third largest category) are expected to account for nearly 80 percent of total Federal research funding in FY 1996.

uncertainty and flux in the Nation's R&D enterprise. For example, during the period March through October 1993, Federal agencies projected total R&D and R&D plant obligations of \$74 billion. As detailed in Table 2 of this Data Brief, agencies now report actual FY 1994 obligations of \$69 billion, a 7 percent downward revision from earlier expectations.

The data presented in this Data Brief are being released in advance of the comprehensive Detailed Statistical

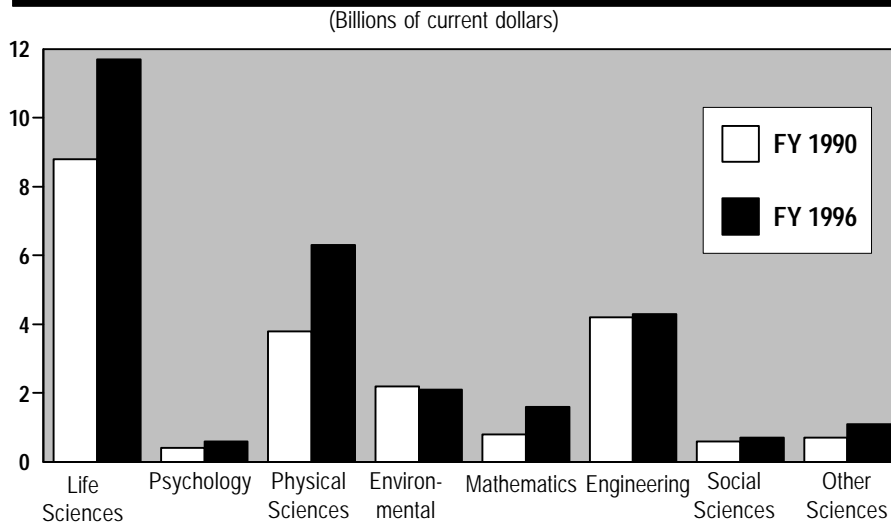
Tables Report, *Federal Funds for Research and Development: Fiscal Years 1994, 1995, and 1996, Volume 44.*

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**Survey Notes**

The 32 Federal agencies that report R&D obligations to the Federal Funds survey submitted actual obligations for FY 1994 and estimates for FYs 1995 and 1996. Data were reported during the period March through October 1995. Agencies can later revise the estimates on the basis of expected changes in the funding levels of R&D programs. Therefore, all FYs 1995 and 1996 obligations are subject to revision in the next survey cycle. Data collected from a survey cycle are put into tables that incorporate changes in prior-year data made by the agencies to reflect program reclassifications. In recent years, agency-reported revisions have been extensive, reflecting the current

**Chart 2. Federal Obligations for Basic and Applied Research, by Fields of Science and Engineering: FYs 1990 and 1996**



**SOURCE:** NSF/SRS, Survey of Federal Funds for Research and Development: Fiscal Years 1994, 1995, and 1996

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