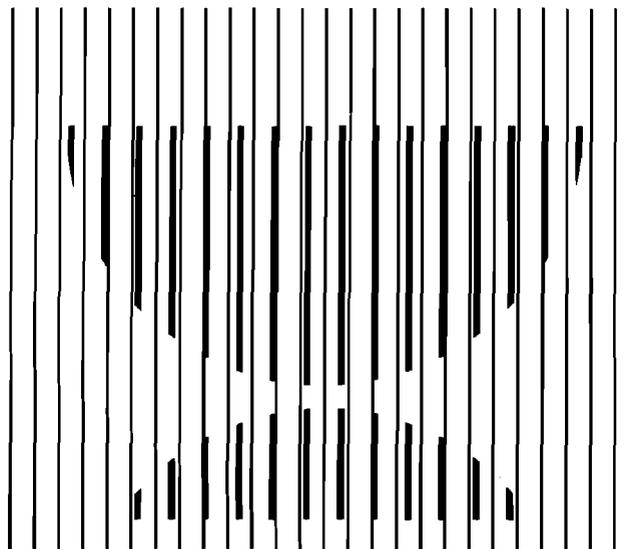


CBO STAFF MEMORANDUM

**LARGE NONDEFENSE R&D PROJECTS
IN THE BUDGET: AN UPDATE**

MARCH 1992



**THE CONGRESS OF THE UNITED STATES
CONGRESSIONAL BUDGET OFFICE
SECOND AND D STREETS, S.W.
WASHINGTON, D.C. 20515**

This staff memorandum was prepared in response to a request from the Senate Budget Committee about the role of large research and development projects in the Administration's 1993 Budget Request.

Philip Webre, together with David Moore, of the Natural Resources and Commerce Division prepared the memorandum under the supervision of Jan Acton and Elliot Schwartz. For further information about the analysis, call (202) 226-2940.

This memo provides an update of the 1991 report by the Congressional Budget Office (CBO) entitled, "Large Nondefense R&D Projects in the Budget: 1980-1996." The executive branch policy of showing a freeze in budget authority for domestic discretionary spending for the fiscal years 1994 through 1997 has complicated the task of evaluating the implications of the Administration's budget request for fiscal year 1993.¹ The budget request fails to make clear the Administration's position on the critical choices that, under overall budgetary constraints, probably must be made between the very largest science and technology projects and all other science spending.

If the largest three projects are funded at the level suggested by the best available projections of their budgetary requirements, their budget authority needs will double between 1992 and 1997. Given the frozen 1994-1997 budget projections for Function 250--General Science, Space, and Technology--doubling the budget of the three largest projects would reduce 1997 funding for all other Function 250 activities by about \$2 billion from their 1992 level.² The Function 250 spending overall would be about \$7.5 billion below the level implied by the projections accompanying the 1992 budget request, which was the last comprehensive presentation of the Administration's civilian science and technology program and its budgetary requirements.

BACKGROUND

In its earlier report, CBO assembled an inventory of 80 large, nondefense research and development (R&D) projects and facilities.³ Most were scientific projects with complex and costly equipment, but several large technology programs were also included. From the inventory, CBO created a revolving series of the three most expensive projects in any given year. The smaller list is intended to show the budgetary effect of the very largest science and technology undertakings, the so-called mega-projects. Of course, the list measures only costs, not the value of the activity. One cannot know before they become operational whether the large projects will prove to be worth their extraordinary expense. Thus the issue of which is more productive--big or little science--is not addressed by this report and remains unresolved.

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1. Except for references to date of publication of the original CBO report, all years in this memorandum refer to fiscal years.
 2. Function 250 funds the National Science Foundation, the space activities within the National Aeronautics and Space Administration, and the general science programs within the Department of Energy (DOE).
 3. For the details of that list, see Congressional Budget Office, "Large Nondefense R&D Projects in the Budget: 1980-1996" (July 1991), pp. 11-18.

From 1992 onward, the three largest projects in the inventory are:

- o the space station,
- o the Earth Observation System (EOS), and
- o the Superconducting Super Collider (SSC).

Had the Administration's 1992 program been enacted, the three largest projects in the inventory would have nearly doubled their share of Function 250 spending--from 14 percent in 1991 to 24 percent in 1996. A share of that size has not been devoted to the largest three nondefense R&D projects since the early 1980s, when they totaled almost 50 percent of Function 250 spending. Unlike the 1993 request, the Administration's 1992 proposal called for increases in overall R&D spending large enough to maintain the levels going to both the largest three projects and other R&D spending. The previous CBO report noted that funding for other science and technology projects would be at greatest risk if budgetary pressures reduced aggregate science spending growth and if funding for the largest projects continued to grow.

Changes to the 1992 Request

The Congress and the Administration took action to redesign and reduce the cost of the space station and EOS, as well as to postpone some spending on the SSC for several years. In March 1991, the National Aeronautics and Space Administration (NASA) presented the Congress with its restructured and scaled-down space station program. Late that year, NASA unveiled a restructured EOS program that would lower its funding requirement during the 1990s from \$17 billion to \$11 billion; about \$2 billion of that reduction would occur in the 1993-1997 period.

For this memorandum, CBO updated the cost estimates of the three largest R&D projects to reflect 1992 legislation. CBO has not, however, done a similar update on the total inventory of 80 large R&D projects. The Administration's estimate of the federal cost of the SSC includes a substantial number of yet-to-be committed funds. In this tally of federal costs, CBO includes only the funds already committed by Texas and India.⁴

4. DOE is also counting a small differential between the cost of building certain components in the United States and building them in the former Soviet Union as a foreign contribution in 1992. Insofar as that reduced the level of funds that the Congress had to appropriate in 1992, CBO also included the differential in its calculations.

ADMINISTRATION REQUEST FOR FISCAL YEAR 1993

The Administration proposes increasing the funding for the three largest civilian R&D projects by \$600 million above the \$2.8 billion they received in the 1992 appropriations. The three will account for almost two-thirds of the \$1.1 billion increase that the Administration proposes for all of Function 250. This rise in Function 250 surpasses the CBO baseline, which estimates that an increase of \$355 million would be sufficient to keep the function at a constant level of resources, adjusted for inflation. The three largest projects also would increase their share of Function 250--from 16 percent in 1992 to more than 18 percent in 1993.

The 1993 request for Function 250 is lower than the 1992 Administration budget plan suggested. In 1992, the Administration forecast that the 1993 request would be \$20.7 billion; but \$18.4 billion has actually been requested. Proposed spending on the three largest projects fell by only \$270 million of the roughly \$2.3 billion cut. (Figure 1 compares the Administration's 1993 request for Function 250, minus the three largest projects, with the Administration's 1992 request and the 1992 appropriations.)

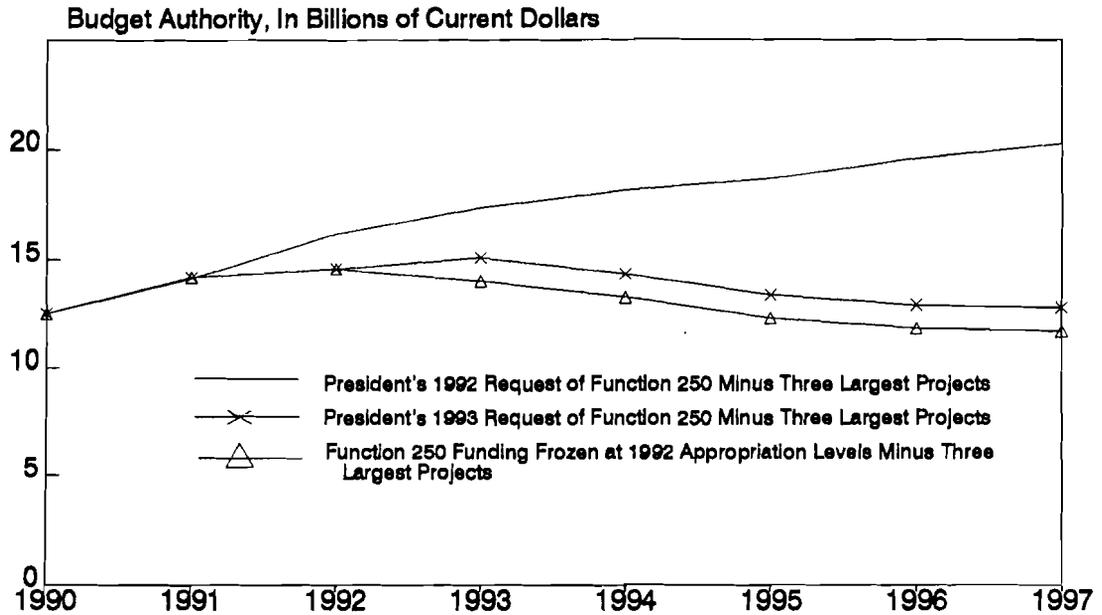
Tradeoffs

As noted in the 1991 study, the risks to smaller R&D projects are the greatest under current circumstances when aggregate science spending growth is restricted and the largest projects continue to grow. In fact, the tradeoffs between the spending for the largest projects and for other science and technology have begun.

For example, the Department of Energy's Office of Energy Research undertook a major review in the fall of 1991, consulting with its panels of experts on how best to accommodate the cuts required by the Budget Enforcement Act (BEA).⁵ At issue was which science projects could be sacrificed, postponed, or delayed. The Superconducting Super Collider was exempted from this review, while most of the rest of DOE's R&D was cut or held flat. From these discussions came a list of research priorities that is reflected in DOE's budget request. Notably, the high-energy physics community reaffirmed its commitment to the SSC, although it expressed dismay that it would be paid for with money from current physics research.

5. See Irwin Goodwin, "Does 1992 Mark the End of an Era for DOE's Crown Jewels of Physics?" Physics Today (December 1991), pp. 53-57.

Figure 1
Alternative Projections of Spending for General Science,
Space, and Technology Minus the President's Request for
the Three Largest Projects, 1990-1997



SOURCE: Congressional Budget Office

NOTE: Function 250 covers spending on general science, space, and technology.
The 1992 request has been extended to 1997 by adjusting for inflation

The Administration's 1994-1997 Projections

The Administration's projections for the years 1994 through 1997 are virtually flat for Function 250 and its major components, reflecting the executive branch policy of showing a freeze in budget authority for domestic discretionary spending. Beginning in 1994, according to the Administration's plan, each proposal to increase spending will be weighed against all other discretionary spending.

The overall request for Function 250 hovers around \$18.4 billion, while NASA and National Science Foundation (NSF) are held constant at \$15 billion and \$3 billion, respectively. This flat forecast contradicts the Administration's stated policy goals for Function 250. Specifically, the 1993 budget request restated the Administration's commitment to doubling NSF funding--to \$3.2 billion--by 1994. Yet NSF cannot reach this goal if its budget is kept flat. Indeed, without additional funds, the expansion of science and technology programs cannot occur as specified in the budget request.

The overall flat forecast for this period, plus the growth in funding for the three largest projects, implies that funding for other programs will be squeezed. Figure 2 shows the percentage changes in funding for the three largest projects and for other Function 250 spending. After an initial increase in 1993, funding for science other than the largest three projects declines during the remainder of the period, and funding for the three largest increases by almost 100 percent.

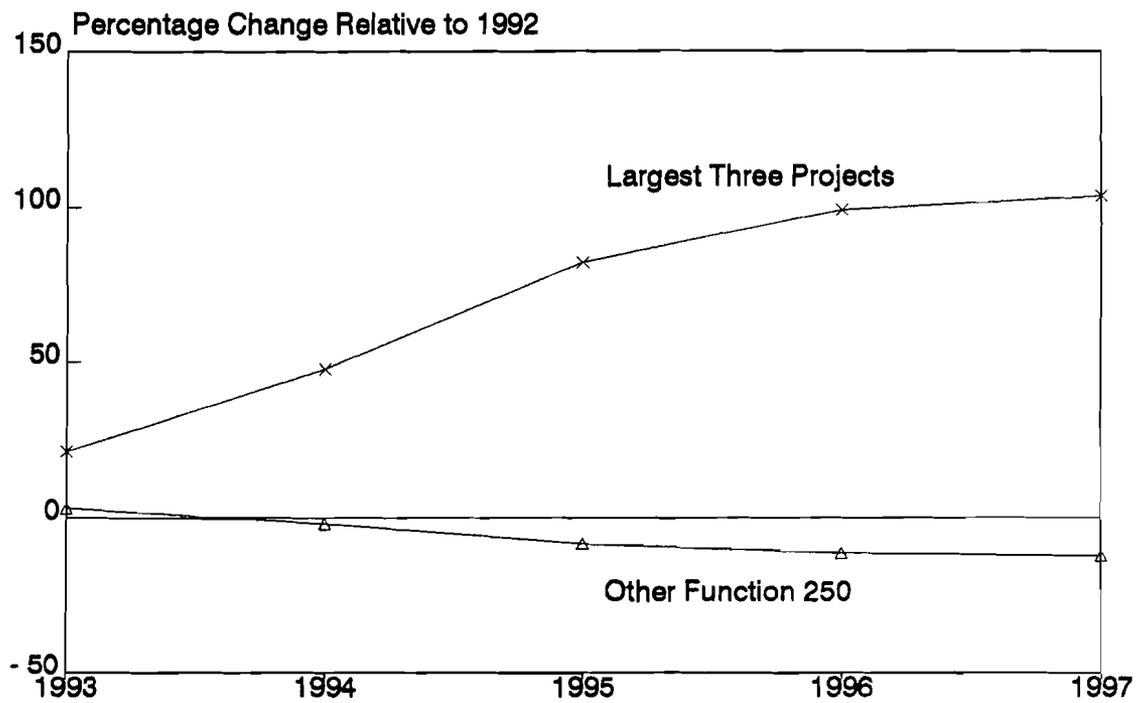
Presidential Initiatives for 1993 Budget

The Administration has also requested substantial increases for several major science initiatives for 1993. The largest three increases in Function 250 involve the space station, the Superconducting Super Collider, and the doubling of the NSF budget by 1994. The Administration has requested an additional \$920 million for those three initiatives, a 19 percent rise to \$6.0 billion. If passed by the Congress, the three initiatives would account for the entire increase in Function 250 save \$140 million. In the Administration's request, their share of Function 250 rises from 29 percent in 1992 to 33 percent in 1993.

EFFECTS OF MANDATED DISCRETIONARY SPENDING CUTS

Both the Administration's and CBO's projections for the budget show a pool of funds that must be cut from domestic discretionary spending under the terms of the BEA. However, neither forecast has allocated any share of the cuts to a specific function. A policy decision of the Congress and the

Figure 2.
Projected Growth of Components
of Function 250 in Administration's
Budget Request



SOURCE: Congressional Budget Office

NOTE: Functions 250 covers spending on general science, space, and technology.

Administration will determine exactly where the cuts are made. In 1993, the total domestic discretionary baseline is \$213 billion in budget authority. To meet the BEA guidelines, CBO estimates that \$6 billion would have to be cut. Should the Congress and the Administration agree on a flat, across-the-board reduction, each function would face a 3 per cent loss of funds. In the case of Function 250, the cut would be \$520 million, more than the entire nominal increase in the CBO baseline and half the increase the Administration is requesting for General Science, Space, and Technology.

In 1994 when the BEA restrictions on transferring funds between the various categories of discretionary spending are removed, aggregate cuts will be deeper. By 1995, the cumulative cuts will be so large that Function 250 is unlikely to escape without any reduction. Even assuming the BEA-mandated cuts of 3 and 4.5 percent were made in 1993 and 1994, a proportional, across-the-board reduction would further reduce the 1995 CBO baseline for Function 250--\$18.8 billion--by over \$400 million.