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## **SPECIAL ANALYSES AND PRESENTATIONS**

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## 6. FEDERAL INVESTMENT SPENDING AND CAPITAL BUDGETING

Investment spending is spending that yields long-term benefits. Its purpose may be to improve the efficiency of internal Federal agency operations or to increase the Nation's overall stock of capital for economic growth. The spending can be direct Federal spending or grants to State and local governments. It can be for physical capital, which yields a stream of services over a period of years, or for research and development or education and training, which are intangible but also increase income in the future or provide other long-term benefits.

Most presentations in the Federal budget combine investment spending with spending for current use. This chapter focuses solely on Federal and federally financed investment. These investments are discussed in the following sections:

- a description of the size and composition of Federal investment spending;
- a discussion of fixed assets used to provide Federal services and efforts to improve planning and budgeting for these assets;
- a presentation of trends in the stock of federally financed physical capital, research and development, and education;
- alternative capital budget and capital expenditure presentations;
- projections of Federal physical capital outlays and recent assessments of public civilian capital needs, as required by the Federal Capital Investment Program Information Act of 1984; and
- a discussion of transportation infrastructure spending.

### Part I: DESCRIPTION OF FEDERAL INVESTMENT

For more than forty years, a chapter in the budget has shown Federal investment outlays—defined as those outlays that yield long-term benefits—separately from outlays for current use. This year, for the second consecutive year, the discussion of the composition of investment includes estimates of budget authority as well as outlays.

The classification of spending into investment and current outlays is a matter of judgment. The budget has historically employed a relatively broad classification, including physical investment, research, development, education, and training. But presentations for particular purposes could adopt different definitions of investment:

- To suit the purposes of a traditional balance sheet, investment might include only those physical assets owned by the Federal Government, excluding capital financed through grants and intangible assets such as research, education, and training.
- Focusing on the role of investment in improving national productivity and enhancing economic growth would exclude items such as national defense assets, the benefits of which are enhanced national security rather than economic growth.
- Concern with the efficiency of Federal operations would lead to a focus solely on investments to reduce costs or improve the effectiveness of internal Federal agency operations, such as computer systems.
- A “social investment” perspective might broaden the coverage of investment beyond what is included in this chapter to encompass programs such as childhood immunization, maternal health, certain nutrition programs, and substance abuse

treatment, which are designed in part to prevent more costly health problems in future years.

The relatively broad definition of investment used in this section provides consistency over time: historical figures on investment outlays back to 1940 can be found in the separate *Historical Tables* volume. The detailed tables at the end of this section allow disaggregation of the data to focus on those investment outlays that best suit a particular purpose.

In addition to this basic issue of definition, there are two technical problems in the classification of investment data, involving the treatment of grants to State and local governments and the classification of spending that could be shown in more than one category.

First, for some grants to State and local governments, the recipient jurisdiction, not the Federal Government, ultimately determines whether the money is used to finance investment or current purposes. This analysis classifies all of the outlays in the category where the recipient jurisdictions are expected to spend most of the money. Hence, the community development block grant is classified as physical investment, although some may be spent for current purposes. General purpose fiscal assistance is classified as current spending, although some may be spent by recipient jurisdictions on physical investment.

Second, some spending could be classified in more than one category of investment. For example, grants for construction of research facilities finance the acquisition of physical assets, but they also contribute to research and development. To avoid double counting, the outlays are classified in the category that is most commonly recognized as investment. Consequently out-

lays for the conduct of research and development do not include outlays for research facilities, because these outlays are included in the category for physical investment. Similarly, physical investment and research and development related to education and training are included in the categories of physical assets and the conduct of research and development.

When direct loans and loan guarantees are used to fund investment, the subsidy value is included as investment. The subsidies are classified according to their program purpose, such as construction, education and training, or non-investment outlays. For more information about the treatment of Federal credit programs, refer to Chapter 8, "Underwriting Federal Credit and Insurance."

This section presents spending for gross investment, without adjusting for depreciation. A subsequent section discusses depreciation and shows investment and capital stocks both gross and net of depreciation.

## Composition of Federal Investment Outlays

### Major Federal Investment

The composition of major Federal investment outlays is summarized in Table 6-1. They include major public physical investment, the conduct of research and development, and the conduct of education and training. Defense and nondefense investment outlays were \$233.2 billion in 1995. Because of reductions in defense spending they are estimated to decline to \$226.0 billion in 1996 and to \$221.7 billion in 1997. Major Federal investment will comprise an estimated 13.6 percent of total Federal outlays in 1997 and 2.8 percent of the Nation's gross domestic product (GDP). Greater detail on Federal investment is available in tables 6-2 and 6-3 at the end of this section. Those tables include both budget authority and outlays.

*Physical investment.*—Outlays for major public physical capital investment (hereafter referred to as physical investment outlays) are estimated to be \$108.1 billion in 1997. Physical investment outlays are primarily outlays for construction, rehabilitation, and major equipment. Slightly more than three-fifths of these outlays are for direct physical investment by the Federal Government, with the remaining two-fifths being grants to State and local governments for physical investment.

Direct physical investment outlays by the Federal Government are primarily for national defense. Defense outlays for physical investment were \$59.9 billion in 1995 and are estimated to decline to \$48.5 billion in 1997. Almost all of these outlays, or \$44.2 billion, are for the procurement of weapons and other military equipment, and the remainder is primarily for construction of military bases, family housing for military personnel, and Department of Energy defense facilities.

Outlays for direct physical investment for nondefense purposes are estimated to be \$19.3 billion in 1997. These outlays include \$11.8 billion for construction and rehabilitation. This amount funds water, power, and natural resources projects of the Army Corps of Engineers, the Bureau of Reclamation within the Depart-

ment of the Interior, the Tennessee Valley Authority, and the power administrations in the Department of Energy; construction and rehabilitation of veterans hospitals and Postal Service facilities; and facilities for space and science programs. Outlays for the acquisition of major equipment are estimated to be \$7.2 billion in 1997. The largest amounts are for the science and space programs and the air traffic control system. Net outlays for the purchase and sale of land and structures are estimated to be \$0.4 billion in 1997. Collections from the sale of facilities are expected to exceed disbursements by \$1.2 billion in 1996, largely due to the proposed sale of the United States Enrichment Corporation.

Grants to State and local governments for physical investment are estimated to be \$40.2 billion in 1997. More than three fifths of these outlays, or \$24.4 billion, are to assist States and localities with transportation infrastructure. Other major grants for physical investment fund sewage treatment plants, community development, and public housing.

*Conduct of research and development.*—Outlays for the conduct of research and development are estimated to be \$69.1 billion in 1997. These outlays are devoted to increasing basic scientific knowledge and promoting related research and development. They increase the Nation's security, improve the productivity of capital and labor for both public and private purposes, and enhance the quality of life. Slightly more than half of these outlays, an estimated \$37.3 billion in 1997, are for national defense. Physical investment for research and development facilities and equipment is included in the physical investment category.

Nondefense outlays for the conduct of research and development are estimated to be \$31.8 billion in 1997. This is almost entirely direct spending by the Federal Government, and is largely for the space programs, the National Science Foundation, the National Institutes of Health, and research for nuclear and non-nuclear energy programs.

*Conduct of education and training.*—Outlays for the conduct of education and training are estimated to be \$44.6 billion in 1997. These outlays add to the stock of human capital by developing a more skilled and productive labor force. Grants to State and local governments for this category are estimated to be \$26.3 billion in 1997, more than half of the total. They include education programs for the disadvantaged and the handicapped, vocational and adult education programs, training programs in the Department of Labor, and Head Start. Direct education and training outlays by the Federal Government are estimated to be \$18.3 billion in 1997. Programs in this category are primarily aid for higher education through student financial assistance, loan subsidies, the veterans GI bill, and health training programs.

This category does not include outlays for education and training of Federal civilian and military employees. Outlays for education and training that are for physical investment and for research and development are in

Table 6-1. COMPOSITION OF FEDERAL INVESTMENT OUTLAYS

(In billions of dollars)

	1995 actual	Estimate	
		1996	1997
<b>MAJOR FEDERAL INVESTMENT OUTLAYS</b>			
Major public physical capital investment:			
Direct:			
National defense .....	59.9	52.5	48.5
Nondefense .....	19.5	18.4	19.3
Subtotal, direct major public physical capital investment ....	79.3	70.8	67.8
Grants to State and local governments .....	39.6	41.3	40.2
Subtotal, major public physical capital investment .....	118.9	112.2	108.1
Conduct of research and development:			
National defense .....	37.7	37.7	37.3
Nondefense .....	30.7	30.8	31.8
Subtotal, conduct of research and development .....	68.4	68.5	69.1
Conduct of education and training:			
Grants to State and local governments .....	24.7	26.7	26.3
Direct .....	21.2	18.6	18.3
Subtotal, conduct of education and training .....	45.9	45.3	44.6
<b>Major Federal investment outlays .....</b>	<b>233.2</b>	<b>226.0</b>	<b>221.7</b>
<b>MEMORANDUM</b>			
Major Federal investment outlays:			
National defense .....	97.6	90.2	85.8
Nondefense .....	135.6	135.8	135.9
Total, major Federal investment outlays .....	233.2	226.0	221.7
Miscellaneous physical investment:			
Commodity inventories .....	-0.9	-0.8	-0.7
Other physical investment (direct) .....	4.5	4.6	4.2
Total, miscellaneous physical investment .....	3.6	3.8	3.4
Total, Federal investment outlays, including miscellaneous physical investment .....	236.8	229.8	225.2

the categories for physical investment and the conduct of research and development.

### ***Miscellaneous Investment Outlays***

In addition to the categories of major Federal investment, several miscellaneous categories of investment outlays are shown in Table 6-1. These items, all for physical investment, are generally unrelated to improving Government for operations or enhancing economic activity. Outlays for commodity inventories are for the purchase or sale of agricultural products pursuant to farm price support programs and the purchase and sale of other commodities such as oil and gas. Sales are estimated to exceed purchases by \$0.7 billion in 1997.

Outlays for other miscellaneous physical investment are estimated to be \$4.2 billion in 1997. This category

includes primarily conservation programs. These outlays are entirely for direct Federal spending.

### **Detailed Tables on Investment Spending**

In order to include more information in the budget on investment, this section provides data on budget authority as well as outlays. Table 6-2 displays budget authority and outlays by major programs according to defense and nondefense categories. Table 6-3 shows budget authority and outlays divided according to grants to State and local governments and direct Federal spending. Table 6-3 displays several allowances for full funding of fixed assets. These appear for atomic energy (defense), domestic nuclear energy, space, and recreational resources. These allowances are discussed in the next section.

Table 6-2. FEDERAL INVESTMENT BUDGET AUTHORITY AND OUTLAYS: DEFENSE AND NONDEFENSE PROGRAMS

(in millions of dollars)

Source	Budget Authority			Outlays		
	1995 actual	Estimate		1995 actual	Estimate	
		1996	1997		1996	1997
<b>FEDERAL INVESTMENT:</b>						
<b>NATIONAL DEFENSE:</b>						
Major public physical investment:						
Construction and rehabilitation:						
Military construction .....	2,623	2,826	2,584	3,654	3,306	3,021
Family housing .....	592	1,020	750	918	849	934
Atomic energy defense activities and other .....	237	410	455	248	248	371
Subtotal, construction and rehabilitation .....	3,452	4,256	3,789	4,820	4,403	4,326
Acquisition of major equipment:						
Procurement .....	43,529	42,177	38,678	54,901	47,927	44,039
Atomic energy defense activities and other .....	-14	147	332	202	156	150
Subtotal, acquisition of major equipment .....	43,515	42,324	39,010	55,103	48,083	44,189
Purchase or sale of land and structures .....	-51	-11	-11	-51	-11	-11
Subtotal, major public physical investment .....	46,916	46,569	42,788	59,872	52,475	48,504
Conduct of research and development						
Defense military .....	35,291	35,633	35,482	35,356	35,203	34,945
Atomic energy and other .....	2,222	2,366	2,347	2,343	2,479	2,347
Subtotal, conduct of research and development .....	37,513	37,999	37,829	37,699	37,682	37,292
Conduct of education and training (civilian) .....	-66	8	5	12	9	6
Subtotal, national defense investment .....	84,363	84,576	80,622	97,583	90,166	85,802
<b>NONDEFENSE:</b>						
Major public physical investment:						
Construction and rehabilitation:						
Highways .....	20,964	17,611	21,958	19,216	20,224	19,293
Mass transportation .....	3,721	3,517	4,732	3,561	3,801	3,645
Rail transportation .....	212	120	214	153	239	294
Air transportation .....	111	2,250	1,381	1,844	1,689	1,554
Water transportation .....	100	144	133	97	139	155
Community development block grants .....	4,819	4,600	4,900	4,333	5,093	4,931
Other community and regional development .....	1,547	1,219	1,328	1,254	1,488	1,388
Pollution control and abatement .....	3,228	3,675	3,828	4,012	3,692	3,635
Water resources .....	1,827	1,697	1,842	2,253	2,196	1,886
Other natural resources and environment .....	282	236	306	435	324	292
Housing assistance .....	6,066	5,607	6,387	6,425	6,719	7,055
General science, space, and technology .....	389	430	581	573	509	469
Energy .....	2,939	1,809	1,523	2,961	1,963	1,604
Veterans hospitals and other health .....	1,234	1,164	1,461	1,294	1,375	1,494
Postal Service .....	1,004	1,282	946	996	1,015	860
GSA real property activities .....				1,008	1,252	1,349
International affairs .....	219	159	220	307	243	267
Other programs .....	562	688	784	786	879	956
Subtotal, construction and rehabilitation .....	49,224	46,208	52,524	51,508	52,840	51,127
Acquisition of major equipment:						
Air transportation .....	2,039	1,910	1,821	2,655	2,073	1,946
Other transportation .....	450	568	629	441	465	481
Space flight, research, and supporting activities .....	814	900	1,307	1,064	874	746
General science and basic research .....	319	262	277	150	253	316
Veterans medical care .....	527	682	475	290	612	641
Postal Service .....	859	2,493	1,104	390	1,195	1,042
General supply fund .....				477	536	538
Other .....	967	1,351	1,436	707	1,345	1,569
Subtotal, acquisition of major equipment .....	5,975	8,166	7,049	6,174	7,353	7,279
Purchase or sale of land and structures						
International affairs .....	9	10	10	9	11	11

Table 6-2. FEDERAL INVESTMENT BUDGET AUTHORITY AND OUTLAYS: DEFENSE AND NONDEFENSE PROGRAMS—Continued

(in millions of dollars)

Source	Budget Authority			Outlays		
	1995 actual	Estimate		1995 actual	Estimate	
		1996	1997		1996	1997
Domestic .....	227	-1,620	167	599	-1,227	346
Subtotal, purchase or sale of land and structures .....	236	-1,610	177	608	-1,216	357
Other physical assets (grants) .....	807	761	879	756	722	804
Subtotal, major public physical investment .....	56,242	53,525	60,629	59,046	59,699	59,567
Conduct of research and development:						
General science, space, and technology:						
NASA .....	7,866	7,760	7,797	8,243	7,999	7,571
National Science Foundation .....	2,137	2,204	2,305	1,894	2,092	2,202
Other general science .....	685	675	1,045	700	715	705
Subtotal, general science, space, technology .....	10,688	10,639	11,147	10,837	10,806	10,478
Energy .....	2,926	2,933	2,455	3,152	3,079	3,054
Transportation:						
Department of Transportation .....	649	596	677	604	520	792
NASA .....	1,186	1,208	1,237	749	1,146	1,233
Subtotal, transportation .....	1,835	1,804	1,914	1,353	1,666	2,025
Health:						
National Institutes of Health .....	10,691	11,273	11,479	10,299	10,335	11,215
All other health .....	980	921	954	1,033	1,000	917
Subtotal, health .....	11,671	12,194	12,433	11,332	11,335	12,132
Agriculture .....	1,194	1,179	1,193	1,186	1,193	1,175
Natural resources and environment .....	1,963	1,868	1,915	1,662	1,615	1,668
International affairs .....	288	198	204	323	225	244
All other research and development .....	1,124	1,003	1,178	888	915	1,020
Subtotal, conduct of research and development .....	31,689	31,818	32,439	30,733	30,834	31,796
Conduct of education and training:						
Education, training, employment and social services:						
Elementary, secondary, and vocational education .....	15,177	15,493	16,204	14,635	15,948	15,701
Higher education .....	14,418	12,039	10,826	14,194	11,435	10,915
Research and general education aids .....	1,939	1,813	2,140	1,842	1,974	1,904
Training and employment .....	5,267	5,475	6,138	5,699	5,855	5,739
Social services .....	5,987	6,143	6,542	5,826	6,328	6,321
Subtotal, education, training, and social services .....	42,788	40,963	41,850	42,196	41,540	40,580
Income security .....	187	220	220	131	191	225
Veterans education, training, and rehabilitation .....	1,338	1,520	1,384	1,374	1,486	1,587
Health .....	826	795	799	766	766	898
International affairs .....	288	223	233	301	263	234
Other education and training .....	1,071	1,063	1,094	1,093	1,014	1,024
Subtotal, conduct of education and training .....	46,498	44,784	45,580	45,861	45,260	44,548
Subtotal, nondefense investment .....	134,429	130,127	138,648	135,640	135,793	135,911
Total, Federal investment .....	218,792	214,703	219,270	233,223	225,959	221,713

Table 6-3. FEDERAL INVESTMENT BUDGET AUTHORITY AND OUTLAYS: GRANT AND DIRECT FEDERAL PROGRAMS

(in millions of dollars)

Source	Budget Authority			Outlays		
	1995 actual	Estimate		1995 actual	Estimate	
		1996	1997		1996	1997
<b>FEDERAL INVESTMENT:</b>						
<b>GRANTS TO STATE AND LOCAL GOVERNMENTS:</b>						
Major public physical investments:						
Construction and rehabilitation:						
Highways .....	20,961	17,610	21,957	19,200	20,212	19,283
Mass transportation .....	3,721	3,517	4,732	3,561	3,801	3,645
Rail transportation .....	18	1	10	20	16	29
Air transportation .....	67	2,214	1,350	1,826	1,622	1,483
Pollution control and abatement .....	2,066	2,366	2,379	2,671	2,360	2,224
Other natural resources and environment .....	95	109	117	264	294	179
Community development block grants .....	4,819	4,600	4,900	4,333	5,093	4,931
Other community and regional development .....	1,307	998	1,066	982	1,170	1,144
Housing assistance .....	4,934	4,574	5,585	5,762	5,801	6,278
National defense .....	70	.....	.....	7	15	9
Other construction .....	136	130	119	173	155	137
Subtotal, construction and rehabilitation .....	38,194	36,119	42,215	38,799	40,539	39,342
Other physical assets .....	862	833	964	780	798	894
Subtotal, major public physical capital .....	39,056	36,952	43,179	39,579	41,337	40,236
Conduct of research and development .....	395	386	391	348	363	445
Conduct of education and training:						
Elementary, secondary, and vocational education .....	14,336	14,844	15,408	13,677	15,246	15,032
Higher education .....	96	27	159	117	106	48
Research and general education aids .....	288	243	501	268	315	276
Training and employment .....	4,064	4,251	4,880	4,573	4,577	4,501
Social services .....	5,742	5,633	6,293	5,584	5,959	5,929
National defense (civilian) .....	.....	.....	.....	4	1	.....
Other .....	506	508	501	492	495	494
Subtotal, conduct of education and training .....	25,032	25,506	27,742	24,715	26,699	26,280
Subtotal, grants for investment .....	64,483	62,844	71,312	64,642	68,399	66,961
<b>DIRECT FEDERAL PROGRAMS:</b>						
Major public physical investment:						
Construction and rehabilitation:						
National defense .....	3,382	4,256	3,789	4,813	4,388	4,317
International affairs .....	219	159	220	307	243	267
Full funding allowance (general science and space) .....	.....	.....	203	.....	.....	.....
Other general science, space, and technology .....	389	430	378	573	509	469
Water resources projects .....	1,788	1,628	1,757	2,009	1,961	1,768
Full funding allowance (recreational resources) .....	.....	.....	81	.....	.....	.....
Other natural resources and environment .....	1,388	1,505	1,642	1,756	1,597	1,642
Full funding allowance (energy) .....	.....	.....	13	.....	.....	.....
Other energy .....	2,939	1,809	1,510	2,961	1,963	1,604
Transportation .....	340	299	368	263	440	500
Veterans hospitals and other health facilities .....	1,187	1,117	1,421	1,230	1,334	1,450
Postal Service .....	1,004	1,282	946	996	1,015	860
Federal Prison System .....	147	219	210	420	326	238
GSA real property activities .....	.....	.....	.....	1,008	1,252	1,349
Other construction .....	1,699	1,641	1,560	1,193	1,676	1,647
Subtotal, construction and rehabilitation .....	14,482	14,345	14,098	17,529	16,704	16,111
Acquisition of major equipment:						
Full funding allowance (atomic energy) .....	.....	.....	182	.....	.....	.....
Other national defense .....	43,515	42,324	38,828	55,103	48,083	44,189
General science and basic research .....	319	262	277	150	253	316
Full funding allowance (space programs) .....	.....	.....	558	.....	.....	.....
Space flight, research, and supporting activities .....	814	900	749	1,064	874	746
Energy .....	219	305	208	250	317	238
Postal Service .....	859	2,493	1,104	390	1,195	1,042
Air transportation .....	2,039	1,910	1,821	2,655	2,073	1,946
Water transportation (Coast Guard) .....	199	228	252	177	217	201

Table 6-3. FEDERAL INVESTMENT BUDGET AUTHORITY AND OUTLAYS: GRANT AND DIRECT FEDERAL PROGRAMS—Continued

(in millions of dollars)

Source	Budget Authority			Outlays		
	1995 actual	Estimate		1995 actual	Estimate	
		1996	1997		1996	1997
Hospital and medical care for veterans .....	527	682	475	290	612	641
General supply fund .....	.....	.....	.....	477	536	538
Other .....	944	1,314	1,520	697	1,200	1,521
Subtotal, acquisition of major equipment .....	49,435	50,418	45,974	61,253	55,360	51,378
Purchase or sale of land and structures:						
National defense .....	-51	-11	-11	-51	-11	-11
International affairs .....	9	10	10	9	11	11
Full funding allowance (recreational resources) .....	.....	.....	30	.....	.....	.....
Other domestic .....	227	-1,620	137	599	-1,227	346
Subtotal, purchase or sale of land and structures .....	185	-1,621	166	557	-1,227	346
Subtotal, major public physical investment .....	64,102	63,142	60,238	79,339	70,837	67,835
Conduct of research and development:						
National defense .....	37,513	37,999	37,829	37,699	37,682	37,292
International affairs .....	288	198	204	323	225	244
Full funding allowance (space programs) .....	.....	.....	342	.....	.....	.....
Other domestic .....	31,006	31,234	31,502	30,062	30,246	31,107
Subtotal, conduct of research and development .....	68,807	69,431	69,877	68,084	68,153	68,643
Conduct of education and training:						
Elementary, secondary, and vocational education .....	841	649	796	958	702	669
Higher education .....	14,322	12,012	10,667	14,077	11,329	10,867
Research and general education aids .....	1,651	1,570	1,639	1,574	1,659	1,628
Training and employment .....	1,203	1,224	1,258	1,126	1,278	1,238
Health .....	826	795	799	766	766	898
Veterans education, training, and rehabilitation .....	1,338	1,520	1,384	1,374	1,486	1,587
National defense .....	-66	8	5	8	8	6
International affairs .....	288	223	233	301	263	234
Other .....	997	1,285	1,062	974	1,079	1,147
Subtotal, conduct of education and training .....	21,400	19,286	17,843	21,158	18,570	18,274
Subtotal, direct Federal investment .....	154,309	151,859	147,958	168,581	157,560	154,752
Total, Federal investment .....	218,792	214,703	219,270	233,223	225,959	221,713

## Part II: PLANNING, BUDGETING, AND ACQUISITION OF FIXED ASSETS

The previous section discussed Federal investment as broadly defined. The focus of this section is much narrower—the review of planning and budgeting for fixed assets during the past year and the resultant budget proposals for fixed assets owned by the Federal Government and used to deliver primarily domestic Federal services. These assets include Federal buildings, information technology, and other facilities and major equipment, including federally owned infrastructure and the space program.<sup>1</sup>

With proposed major agency restructuring, organizational streamlining and other reforms, it may be appro-

appropriate to reduce spending for some assets, such as office buildings, and increase spending for others, such as information technology, to increase the productivity of a smaller workforce. In either case, in a time of severely constrained resources, it is essential that the caliber of government planning and budgeting for fixed assets be high.

### Improving Planning, Budgeting, and Acquisition of Fixed Assets

During 1994 and 1995 the Office of Management and Budget (OMB) devoted particular attention to improving the process of planning, budgeting, and acquiring fixed assets. After seeking out and analyzing the problems, which differed from agency to agency, OMB reissued the comprehensive guidance to agencies on this process in 1995 that it had first issued the year before.

<sup>1</sup>Not included are national defense weapons systems, grants to State and local governments and to others, and the Postal Service. The definition this year is broader than the definition used last year in the *Analytical Perspectives* volume that accompanied the 1996 Budget. Last year the definition excluded federally owned infrastructure, such as water resources projects and the air traffic control system, power marketing activities, and the space programs, all of which are included this year.

A separate OMB review focused on fixed assets. The Administration proposes to make agencies responsible for the fixed assets they use, and to work throughout the coming year to improve agency planning, budgeting, acquisition, management, and accountability for these assets.

**Long-term planning and analysis.**—Planning and managing fixed assets has historically been a low priority for most agencies. Attention focuses on coming-year appropriations, and justifications are generally lists of desired projects. The increased use of long-range planning linked to performance goals required by the Government Performance and Results Act would provide a better basis for justifications. It would increase foresight and improve the odds for cost-effective investments.

The lack of integrated life-cycle planning for fixed assets at many agencies and their operation was evident in the review. Research equipment was acquired with inadequate funding for its operation. New medical facilities sometimes were built without funds for maintenance and operation. New information technology sometimes was acquired without planning for associated changes in agency operations.

OMB Bulletin 95-03: "Planning and Budgeting for the Acquisition of Fixed Assets," provided guidance for agencies on what fixed asset planning should include. Agencies were requested to approach planning for fixed assets in the context of strategic plans to carry out their missions, and to consider alternative methods of meeting their goals. Systematic analysis of the full life-cycle expected costs and benefits was required, along with risk analysis and assessment of alternative means of acquiring assets. The Bulletin noted other OMB guidance in planning and budgeting for fixed assets.<sup>2</sup>

The Bulletin is part of an ongoing effort to improve decision making on the acquisition of fixed assets. OMB will be working with the President's Management Council and the agencies in 1996 to carry it out more completely.

**From Planning to Budgeting.**—Long-range agency plans should channel fully justified budget-year and out-year proposals into the budget process. Agencies were asked to submit projections of both budget authority and outlays for all investment spending, not only for the budget year, but for the four out-years. For fixed assets, agencies were asked to provide specific

proposals going beyond the budget year. In addition, OMB held a separate review on fixed assets in the 1997 Budget Review process. This provided an overview of requests, flagged issues, and considered cross-cutting recommendations. Agency-specific fixed asset issues were highlighted in the agency reviews.

Attention was given to whether the "lumpiness" of some fixed assets disadvantaged them in the budget review process. In some cases, agencies aggregate fixed asset acquisitions into budget accounts containing only such acquisitions; such accounts tend to smooth out year-to-year changes in outlays and avoid crowding other expenditures. In other cases, agencies or program managers do not hesitate to request "spikes" or "bulges" in spending for asset acquisitions, and the review process accommodates them. But some agencies go out of their way to avoid such spikes, and some agencies have trouble accommodating them. The Bulletin encouraged agencies to accommodate justified spikes in their own internal reviews, and the OMB review also made special allowance for these one-time increases.

**Full Funding of Fixed Assets.**—Good budgeting requires that appropriations for the full costs of asset acquisition be provided up front to help ensure that all costs and benefits are fully taken into account when decisions are made about providing resources. In most cases this rule is followed throughout the Government. When it is not followed and fixed assets are funded in increments, without certainty if or when future funding will be available, it can and occasionally does result in poor planning, acquisition of assets not fully justified, higher acquisition costs, cancellation of major projects, the loss of sunk costs, and inadequate funding to maintain and operate the assets.

This budget includes full funding requests for a number of projects that might have been funded in increments in past years. For certain of these projects, budget authority of \$1.4 billion is requested for 1997 in a separate allowance for full funding of fixed assets. The request appears in the governmentwide general provisions in the *Appendix* volume of the *1997 Budget*. These projects are identified below in the discussion that accompanies Table 6-4. Next year additional effort will be made to include full upfront funding for all new projects, or at least economically and programatically viable segments (or modules) of new projects.

**Other Budgeting Issues.**—The nature of asset acquisition requires some flexibility in funding. One-year funding often may not be enough to complete the acquisition process. Most agencies request multi-year funding to complete acquisitions efficiently, and the Bulletin encourages this. As noted, many agencies aggregate asset acquisition in budget accounts for this purpose. In some cases, these are revolving funds which "rent" the assets to the agency's programs.

To promote better program performance, agencies are also being encouraged by OMB to examine their budget account structures to better align them with program outputs and outcomes and to charge the appropriate

<sup>2</sup> Other OMB guidance includes: (1) OMB Circular No. A-109, Major System Acquisitions, which establishes policies for planning major systems that are generally applicable to fixed asset acquisitions. (2) OMB Circular No. A-94, Guidelines and Discount Rates for Benefit-Cost Analysis of Federal Programs, which provides guidance on benefit-cost, cost-effectiveness, and lease-purchase analysis to be used by agencies in evaluating Federal activities including fixed asset acquisition. It includes guidelines on the discount rate to use in evaluating future benefits and costs, the measurement of benefits and costs, the treatment of uncertainty, and other issues. This guidance must be followed in all analyses submitted to OMB in support of legislative and budget programs. (3) Executive Order No. 12893, "Principles for Federal Infrastructure Investments," which provides principles for the systematic economic analysis of infrastructure investments and their management. (4) OMB Bulletin No. 94-16, Guidance on Executive Order No. 12893, "Principles for Federal Infrastructure Investments," which provides guidance for implementing this order and appends the order itself. (5) The revision of OMB Circular No. A-130, Transmittal 2, Management of Federal Information Resources (July 15, 1994), which provides principles for internal management and planning practices for information systems and technology (published in the *Federal Register* (Part V), July 25, 1994, pp. 37905-37928).

account with significant costs used to achieve these results. The asset acquisition rental accounts, mentioned above, would contribute to this. Budgeting this way would provide information and incentives for better resource allocation among programs and a continual search for better ways to deliver services. It would also provide incentives for efficient fixed asset acquisition and management.

**Acquisition of Fixed Assets.**—Improved planning and budgeting for fixed assets should increase the ability of agencies to acquire fixed assets within, or close to, the original estimates of cost, schedule, and performance goals. Agencies have not always been able to do this in the past on large acquisitions. In conjunction with efforts to improve planning and budgeting for fixed assets, Title V of the Federal Acquisition Streamlining Act (FASA) of 1994 requires agencies to improve the management of large acquisitions. FASA requires baseline cost, schedule, and performance goals for large acquisitions and management of the acquisitions to achieve, on average, 90 percent of the baseline goals. Management to baseline goals will reduce the propensity of agencies to propose acquisition costs lower than realistically expected to improve the chance of program approval. Management to realistic goals means that agencies must put in place performance-based management systems to obtain accurate program management information. These systems will provide significantly improved information that will allow management to analyze the achievement of, or deviation from, baseline goals and make informed decisions on the continued viability of ongoing acquisitions.

The Administrator of the Office of Federal Procurement Policy in OMB is required to submit to Congress an annual assessment of the progress made by civilian agencies in implementing the above policy. (The Secretary of Defense reports separately for Defense acquisition programs). For the Administrator's first report, civilian agencies were asked in OMB Bulletin 95-03 to submit, for fixed asset acquisitions of \$20 million or more, information on their use of performance-based management systems to accurately measure actual contract accomplishments against the baseline estimates and to report the extent of achievement of the baseline goals. As expected for this first report, the information submitted by the agencies was insufficient to evaluate the achievement of the average of the cost, schedule, and performance goals or to demonstrate that adequate management systems are in place. However, the information submitted by the agencies indicated that many acquisition programs are falling substantially short of their original goals. OMB has developed draft guidance to implement FASA, Title V, throughout the civilian agencies. The draft guidance has been reviewed by the President's Management Council, with final guidance for the agencies expected in the Spring. Major improvements in acquisition management are expected to be reported next year.

**Outlook.**—The effort to improve planning and budgeting for fixed assets will continue in 1996.

- OMB and the President's Management Council will work with agencies to improve planning, analysis, and acquisition of fixed assets, as required in Bulletin 95-03: "Planning and Budgeting for the Acquisition of Fixed Assets."
- In the OMB review process, proposals for the acquisition of fixed assets and related issues of lumpiness or "spikes" will continue to receive special attention. Agencies will be encouraged to give the same special attention to future asset acquisition proposals.
- To ensure that the full costs and benefits of all budget proposals are fully taken into account in allocating resources, agencies will be required to include upfront budget authority for acquisitions in their budget requests.
- OMB will be working with congressional committees, the President's Management Council, and the Chief Financial Officers Council, to help agencies with their responsibility for fixed assets through the alignment of budgetary resources with program results.
- OMB will finalize the guidance to implement the requirements of FASA Title V within the civilian agencies and develop materials for OMB use in reviewing agency planning for new acquisitions and performance information on acquisitions in process.

### Major Acquisition Proposals

For the definition of major fixed assets described above, this budget requests \$19.2 billion of budget authority for 1997. The major requests are shown in the accompanying Table 6-4: "Fixed Asset Acquisitions."

### Buildings

This category includes both general purpose office buildings as well as special purpose buildings, such as hospitals, prisons, and courthouses. This budget includes \$6.6 billion of budget authority for 1997 for the major building acquisitions included in the fixed assets definition.

**Military construction and family housing.**—The budget includes \$3.3 billion for general construction on military bases and family housing. This funding will be used to:

- support the fielding of new systems;
- enhance operational readiness, including deployment and support of military forces;
- provide housing for military personnel and their families;
- implement base closure and realignment actions; and
- correct safety deficiencies and environmental problems.

**General Services Administration.**—The 1997 budget requests \$1.4 billion for GSA for the construction or renovation of buildings. These funds will allow for new construction for U.S. Courts and the acquisition of gen-

eral purpose office space in locations where long-term needs show that ownership is preferable to leasing.

**Veterans hospital construction.**—The budget requests \$0.4 billion in budget authority for new construction and rehabilitation of veterans hospitals, clinics, and other facilities for 1997. This request includes incremental funding for new veterans hospitals at Travis Air Force Base, California, and Brevard County, Florida, plus full funding for the expansion or renovation of medical facilities in Wilkes-Barre, Pennsylvania; Pittsburgh; Salisbury, North Carolina; Marion, Indiana; and at other locations.

**National Institutes of Health (NIH).**—The budget requests \$0.3 billion to fully fund a new Clinical Research Center on the NIH campus. This state-of-the-art clinical research facility will house laboratories and hospital beds under one roof, and allow for the continuation of the best research possible and its availability to nearby patients.

**Table 6-4. FIXED ASSET ACQUISITIONS**  
(Budget authority in billions)

	1995 actual	1996 proposed	1997 proposed
<b>Buildings:</b>			
Defense military construction and family housing .....	3.3	3.8	3.3
General Services Administration .....	1.2	1.2	1.4
Veterans hospital construction .....	0.5	0.4	0.4
National Institutes of Health .....	.....	*	0.3
Other agencies .....	1.0	1.0	1.1
Subtotal, buildings .....	5.9	6.3	6.6
<b>Information technology:</b>			
Department of Defense .....	2.0	2.1	2.1
Department of Commerce .....	0.3	0.4	0.6
Tax system modernization (IRS) .....	0.3	0.3	0.3
Social Security Administration .....	0.1	0.3	0.3
Other agencies .....	0.5	0.6	0.6
Subtotal, information technology .....	3.2	3.7	3.9
<b>Other acquisitions:</b>			
Department of Transportation .....	2.2	2.1	2.1
Full funding allowance for fixed assets .....	.....	.....	1.4
Army Corps of Engineers .....	1.1	1.0	1.0
NASA .....	1.0	1.0	0.9
Department of Energy .....	0.8	0.6	0.6
Department of Veterans Affairs .....	0.7	0.6	0.5
Other agencies .....	3.2	2.5	2.2
Subtotal, other acquisitions .....	9.0	7.9	8.7
<b>Total, fixed assets .....</b>	<b>18.1</b>	<b>18.0</b>	<b>19.2</b>
<b>Addendum: Full funding allowance for fixed assets:</b>			
NASA .....	.....	.....	0.9
Department of Energy .....	.....	.....	0.4
Department of Interior .....	.....	.....	0.1
<b>Total .....</b>	<b>.....</b>	<b>.....</b>	<b>1.4</b>

\* \$50 million or less.

**Other building acquisitions.**—Other building acquisitions are primarily for Federal prisons; the Research Triangle Park consolidated facility in North Carolina for the Environmental Protection Agency; the Depart-

ment of State for buildings abroad; a National Laboratory Center and fire research facility for the Bureau of Alcohol, Tobacco, and Firearms; and renovation of aging and obsolete research laboratories for the National Institute of Standards and Technology in the Department of Commerce.

**Information Technology**

This category includes computer hardware, major software, and renovations required for this equipment. This budget includes \$3.9 billion in 1997 budget authority for major information technology included in the fixed assets category.

**Department of Defense.**—The budget requests \$2.1 billion for the Department of Defense for information technology for defense-wide procurement. These funds will be used to purchase hardware and software to improve information security for critical computer systems, support worldwide communications to bases and deployed forces, replace obsolete equipment, and improve the information processing capabilities for the Department.

**Department of Commerce.**—The budget requests \$0.6 billion for the multi-year acquisition of information technology critical to the National Weather Service Modernization initiative underway at the Department of Commerce. The modernization initiative involves the development and deployment of advanced radar equipment, other ground observing systems, and geostationary (GOES) and polar orbiting satellites. GOES satellites provide information necessary to make severe weather predictions, while Polar satellites provide the data necessary to make routine weather forecasts. The key integrating system is the Advanced Weather Interactive Processing System (AWIPS) which processes the massive amounts of incoming data into weather products usable to meteorologists in “real time.” The modernization and cutting-edge information technology has greatly improved weather warnings and forecasts which results in lives and property saved.

**Internal Revenue Service Tax Systems Modernization.**—The budget includes \$0.3 billion for 1997 to continue acquisitions for the IRS tax systems modernization (TSM) project. With related spending the total request is \$0.8 billion for 1997. This is a large, capital-intensive investment to modernize antiquated systems and processes. The 1997 funding will finance infrastructure and computing center hardware, telecommunications and security, and customer service workstations. The long-term business vision for TSM includes providing alternative means of filing returns and paying taxes; improving taxpayer contacts via telephone and resolving taxpayer issues with a single contact; enhancing compliance issue identification; and giving employees immediate access to complete information and the modern tools to do their jobs.

**Social Security Administration.**—This request of \$0.3 billion for 1997 is to modernize the information technology systems used by the Social Security Administration. The funds will allow for replacement of an antiquated main-frame based architecture that uses “dumb

terminals” with a nation-wide system of modern personal computers and local area networks.

*Other.*—Other major information technology purchases include funds for the Department of Justice to acquire communications and ADP equipment to support law enforcement activities in the Federal Bureau of Investigation, the Drug Enforcement Administration, and the Immigration and Naturalization Service; and to support medical care for veterans’ hospitals.

### **Other Acquisitions**

This category includes facilities and major equipment not included above. The budget requests \$8.7 billion for the acquisitions included in this fixed assets category, including an allowance of \$1.4 billion to fully fund certain acquisitions now funded incrementally.

*Department of Transportation.*—The budget requests \$2.1 billion for the Department of Transportation, which includes \$1.8 billion for equipment to modernize the air traffic control system and \$0.3 billion for Coast Guard vessels and shore facilities.

*Full funding allowance for fixed assets.*—In a separate allowance the budget requests \$1.4 billion to provide full upfront funding for certain fixed assets that would otherwise have been funded incrementally. The amounts are proposed in the governmentwide general provisions in the *Appendix* volume of the budget, which requests that the funds be transferred to the parent accounts in the three agencies acquiring the assets. The amount is included in the budget totals as a governmentwide allowance, not attributed to the three agencies. This request is part of an initiative to improve planning and budgeting for fixed assets and avoid the problems of incremental funding.

*NASA.*—The allowance requests that \$0.9 billion be transferred to NASA. This includes \$558 million for the Tracking and Data Relay Satellite Replenishment program and \$342 million for the New Millennium program.

*Department of Energy.*—The allowance requests that \$0.4 billion be transferred to the Department of

Energy. These funds include \$182 million for environmental projects, \$131 million for the Relativistic Heavy Ion Collider at Brookhaven National Laboratory, \$37 million for the Fermilab Main Injector, \$35 million for the B-factory at the Stanford Linear Accelerator Center, and \$13 million for the Combustion Research Facility, Phase II.

*Department of the Interior.*—The allowance requests that \$111 million be transferred to the National Park Service for restoration of the Elwha River in Olympia National Park, including the removal of two aging dams, starting in 1998.

*Army Corps of Engineers.*—The budget requests \$1.0 billion for fixed assets for the Corps of Engineers. These funds finance construction, rehabilitation, and related activity for water resources development projects that provide navigation, flood control, water supply, hydroelectric, and other benefits.

*NASA.*—The budget includes \$0.9 billion for NASA for acquisitions in this category. The acquisitions include the International Space Station, important space shuttle upgrades, the Cassini mission to Saturn, the advanced x-ray astrophysics facility, and the Earth observing system, in addition to a wide variety of research and technology acquisitions.

*Department of Energy.*—This budget includes \$0.6 billion for major facilities. These are largely for general science and research activities, environmental restoration, weapons activities, nuclear and non-nuclear energy activities, and the Bonneville Power Administration fund.

*Department of Veterans Affairs.*—The budget requests \$0.5 billion for medical equipment for veterans’ hospitals. This equipment is for new and refurbished medical facilities, for equipment requirements at existing facilities, and for additional needed medical equipment.

*Other.*—Other major acquisitions in this category are for the Tennessee Valley Authority for dams, locks, and other facilities; and the purchase of vehicles by the General Services Administration.

## **Part III: FEDERALLY FINANCED CAPITAL STOCKS**

Federal investment spending, by definition, creates a “stock” of capital that is available in the future for productive use. Each year, Federal investment outlays add to the stock of capital. At the same time, however, wear and tear and obsolescence reduce it. This section presents very rough measures over time of three different kinds of capital stocks financed by the Federal Government: public physical capital, research and development (R&D), and education. Capital stocks are not estimated for training.

Federal spending for physical assets adds to the Nation’s capital stock of tangible assets, such as roads, buildings, and aircraft carriers. These assets deliver a flow of services over their lifetime. The capital depreciates as the asset is used, wears out, or becomes obsolete.

Federal spending for the conduct of research, development, and education adds to an “intangible” asset, the Nation’s stock of knowledge. Although financed by the Federal Government, the research and development or education can be performed by Federal or State government laboratories, universities and other nonprofit organizations, or private industry. Research and development covers a wide range of endeavors, from the investigation of subatomic particles to the exploration of outer space; it can be “basic” research without particular applications in mind, or it can have a highly specific practical use. Similarly, education includes a wide variety of programs, assisting people of all ages with basic education through graduate studies. Like physical assets, the capital stocks of R&D and education provide

services over a number of years and depreciate as they become outdated.

For this analysis, physical and R&D capital stocks are estimated using the perpetual inventory method. In this method, the estimates are based on the sum of net investment in prior years. Each year's Federal outlays are treated as gross investment, adding to the capital stock; depreciation and discards reduce the capital stock. Gross investment less depreciation and discards is net investment. One limitation of the perpetual inventory method is that investment spending is not necessarily an accurate measure of the value of the asset created. However, alternative methods for measuring asset value, such as direct surveys of current market worth or indirect estimation based on an expected rate of return, are difficult to apply to investments without a private market, such as highways or defense procurement.

In contrast to physical and R&D stocks, the estimate of the education stock is based on the replacement cost method. Data on the cumulative years of education in the U.S. population are combined with data on the cost of education and the Federal share of education spending to yield the cost of replacing the Federal share of the Nation's stock of education.

Additional detail about the methods used to estimate capital stocks appears in a methodological note at the end of this section. It should be stressed that these estimates are rough approximations, and provide a basis only for making broad generalizations. Errors may arise from incomplete data for historical outlays, imprecision in the deflators used to express costs in constant dollars, and uncertainty about the useful lives and depreciation rates of different types of assets.

## The Stock of Physical Capital

This section presents data on stocks of physical capital assets and estimates of the depreciation on these assets.

**Trends.**—Table 6-5 shows the value of the net federally financed physical capital stock since 1960, in constant fiscal year 1987 dollars.<sup>3</sup> After rising in the 1960s, the total stock held constant through the 1970s and began rising again in the early 1980s. The stock reached a high of \$1,383 billion in 1994 and is estimated to decline slightly to \$1,356 billion by 1997. In 1995, the national defense capital stock accounted for \$651 billion, or 47 percent of the total, and nondefense stocks for \$731 billion, or 53 percent of the total.

Real stocks of defense and nondefense capital show very different trends. Nondefense stocks have grown consistently since 1970, increasing from \$368 billion in 1970 to \$731 billion in 1995. With the investments proposed in the budget, nondefense stocks are estimated to grow to \$761 billion in 1997. During the 1970s, the nondefense capital stock grew at an average annual rate of 3.9 percent. In the 1980s, however, the growth rate slowed to just over half that rate, or 2.0 percent annually, with growth slightly above that rate since then.

National defense stocks began in 1970 at a relatively high level, and declined steadily throughout the decade, as depreciation from the Vietnam era exceeded new investment in military construction and weapons procurement. Starting in 1983, however, a large defense buildup began to increase the stock of defense capital. By 1992, the defense stock had nearly equaled its size at the height of the Vietnam War. In the last few years, depreciation on this increased stock and a slower

<sup>3</sup>Constant dollar stock estimates do not reflect the revisions to the National Income and Product Accounts (NIPAs) released in January 1996.

Table 6-5. NET STOCK OF FEDERALLY FINANCED PHYSICAL CAPITAL

(In billions of constant 1987 dollars)

Fiscal Year	Total	National Defense	Total Nondefense	Direct Federal Capital			Capital Financed by Federal Grants				
				Total	Water and Power	Other	Total	Transportation	Community and Regional	Natural Resources	Other
Five year intervals:											
1960 .....	903	689	214	119	73	46	95	62	15	11	7
1965 .....	974	686	288	139	84	55	149	113	17	10	9
1970 .....	1,063	696	368	152	92	60	215	164	26	11	15
1975 .....	1,023	583	441	162	101	61	278	195	45	21	17
1980 .....	1,009	470	539	176	113	63	363	225	74	46	17
1985 .....	1,100	501	599	187	114	72	413	250	89	59	14
Annual data:											
1990 .....	1,306	649	657	207	114	93	450	278	92	65	14
1991 .....	1,339	670	669	212	114	98	457	283	92	66	15
1992 .....	1,365	680	685	221	115	106	464	289	92	66	17
1993 .....	1,380	681	699	228	115	113	471	294	92	67	19
1994 .....	1,383	670	714	232	114	118	481	301	92	67	22
1995 .....	1,382	651	731	238	114	125	493	307	92	67	26
1996 est. ....	1,372	625	747	243	112	130	505	314	94	67	30
1997 est. ....	1,356	595	761	247	111	136	514	319	94	67	34

pace of defense investment have begun to reduce the stock somewhat from its recent levels.

Another trend in the Federal physical capital stocks is the shift from direct Federal assets to grant-financed assets. In 1960, 56 percent of federally financed nondefense capital was owned by the Federal Government, and 44 percent was owned by State and local governments but financed by Federal grants. Expansion in Federal grants for highways and other state and local capital, coupled with relatively slow growth in direct Federal investments by agencies such as the Bureau of Reclamation and Corps of Engineers, shifted the composition of the stock substantially. In 1995, 33 percent of the nondefense stock was owned by the Federal Government and 67 percent by State and local governments.

The growth in the stock of physical capital financed by grants has come in several areas. The growth in the stock for transportation is largely grants for highways, including the Interstate Highway System. The growth in community and regional development stocks occurred largely with the enactment of the community development block grant in the early 1970s. The value of this capital stock has been unchanged in the past few years. The growth in the natural resources area occurred primarily because of construction grants for sewage treatment facilities. The value of this federally financed stock has also been relatively stable since the mid-1980s.

Table 6-6 shows nondefense physical capital outlays both gross and net of depreciation since 1960. Total nondefense net investment has been consistently positive over the period covered by the table, indicating that new investment has exceeded depreciation on the existing stock. For some categories in the table, such as water and power programs, net investment has been

negative in some years, indicating that new investment has not been sufficient to offset depreciation. The net investment in this table is the change in the net nondefense physical capital stock displayed in Table 6-5.

### The Stock of Research and Development Capital

This section presents data on the stock of research and development, taking into account adjustments for its depreciation.

**Trends.**—As shown in Table 6-7, the R&D capital stock financed by Federal outlays is estimated to be \$655 billion in 1995 in constant 1987 dollars. About two-fifths is the stock of basic research knowledge; about three-fifths is the stock of applied research and development.

The total federally financed R&D stock in 1995 was about evenly divided between defense and nondefense. Although investment in defense R&D has exceeded that of nondefense R&D in every year since 1979, the two stocks are much closer in size because of the different emphasis between basic research and applied R&D. Defense R&D spending is heavily concentrated in applied research and development, which depreciates much more quickly than basic research. Applied research and development is assumed to depreciate at a ten percent geometric rate, while basic research is assumed not to depreciate at all.

The defense R&D stock rose slowly during the 1970s, as gross outlays for R&D trended down in constant dollars and the stock created in the 1960s depreciated. A renewed emphasis on defense R&D spending from 1980 through 1989 led to a more rapid growth of the R&D stock. Since then, defense R&D outlays have ta-

Table 6-6. COMPOSITION OF GROSS AND NET FEDERAL AND FEDERALLY FINANCED NONDEFENSE PUBLIC PHYSICAL INVESTMENT

(In billions of constant 1987 dollars)

Fiscal Year	Total nondefense investment			Direct Federal investment					Investment financed by Federal grants						
	Gross	Depreciation	Net	Gross	Depreciation	Net	Composition of net investment		Gross	Depreciation	Net	Composition of net investment			
							Water and power	Other				Transportation (mainly highways)	Community and regional development	Natural resources and environment	Other
Five year intervals:															
1960 .....	21.0	8.3	12.7	7.3	4.6	2.7	1.4	1.3	13.7	3.7	10.0	10.2	-0.3	-0.2	0.3
1965 .....	29.9	11.1	18.9	10.5	5.6	4.9	2.1	2.8	19.5	5.5	14.0	12.4	1.4	-*	0.3
1970 .....	29.2	14.5	14.7	7.3	6.6	0.7	1.0	-0.3	21.9	7.9	14.0	8.6	3.8	0.4	1.2
1975 .....	29.9	17.6	12.3	9.3	7.3	2.0	2.0	-*	20.6	10.3	10.3	3.8	2.9	3.3	0.3
1980 .....	37.7	20.1	17.6	10.0	7.6	2.4	1.4	1.0	27.7	12.5	15.2	6.1	4.8	4.8	-0.5
1985 .....	37.8	23.6	14.2	12.1	8.3	3.7	0.1	3.6	25.8	15.3	10.5	6.7	2.3	1.9	-0.4
Annual data:															
1990 .....	38.8	27.8	11.0	14.1	9.7	4.3	0.2	4.1	24.8	18.1	6.7	5.1	*	0.7	0.8
1991 .....	40.6	28.8	11.9	15.3	10.1	5.1	-0.2	5.4	25.4	18.6	6.7	5.0	-0.1	0.8	1.0
1992 .....	45.4	29.8	15.6	19.3	10.6	8.6	1.1	7.5	26.1	19.2	6.9	5.1	-0.1	0.7	1.3
1993 .....	45.7	30.9	14.8	18.2	11.2	7.1	-0.1	7.1	27.5	19.8	7.7	5.9	-0.4	0.3	1.8
1994 .....	46.3	32.0	14.2	16.0	11.6	4.4	-1.1	5.5	30.3	20.4	9.9	6.2	0.1	0.1	3.5
1995 .....	51.1	33.2	17.9	18.2	12.1	6.2	-0.1	6.3	32.8	21.1	11.7	6.7	0.6	0.4	4.0
1996 est. ....	50.4	34.4	16.0	16.9	12.6	4.3	-1.2	5.5	33.6	21.8	11.7	6.7	1.2	*	3.8
1997 est. ....	49.3	35.6	13.7	17.4	13.0	4.4	-1.7	6.1	31.9	22.6	9.3	4.9	0.8	-0.2	3.9

\* \$50 million or less.

Table 6-7. NET STOCK OF FEDERALLY FINANCED RESEARCH AND DEVELOPMENT <sup>1</sup>

(In billions of constant 1987 dollars)

Fiscal Year	National Defense			Nondefense			Total Federal		
	Total	Basic Research	Applied Research and Development	Total	Basic Research	Applied Research and Development	Total	Basic Research	Applied Research and Development
Five year intervals:									
1970 .....	207	13	195	170	54	117	378	66	311
1975 .....	217	16	201	206	77	129	423	93	330
1980 .....	217	20	197	241	103	138	458	123	335
1985 .....	244	24	221	260	135	126	505	158	346
Annual data:									
1990 .....	300	28	272	290	174	116	590	202	387
1991 .....	303	29	274	300	184	116	603	213	390
1992 .....	306	30	276	310	193	117	616	223	393
1993 .....	308	30	278	321	203	118	629	233	396
1994 .....	310	31	279	332	212	120	642	243	399
1995 .....	311	32	279	344	221	122	655	254	401
1996 est. ....	311	34	278	355	231	124	667	264	402
1997 est. ....	311	35	277	367	240	126	678	275	403

<sup>1</sup>Excludes outlays for physical capital for research and development, which are included in Table 6-5.

pered off, depreciation has grown, and, as a result, the net defense R&D stock has grown more slowly.

The growth of the nondefense R&D stock slowed from the 1970s to the late 1980s, from an annual rate of 3.6 percent in the 1970s to a rate of 1.6 percent from 1980 to 1988. Gross investment in real terms fell during much of the 1980s, and about three-fourths of new outlays went to replacing depreciated R&D. Since 1988, however, nondefense R&D outlays have been on an upward trend while depreciation has edged down. As a result, the net nondefense R&D capital stock has grown more rapidly.

### The Stock of Education Capital

This section presents estimates of the stock of education capital financed by the Federal government.

As shown in Table 6-8, the federally financed education stock is estimated at \$649 billion in 1995 in constant 1987 dollars, rising to \$692 billion in 1997.

The vast majority of the Nation's education stock is financed by State and local governments, and by students and their families themselves. This federally financed portion of the stock represents about 3 percent of the Nation's total education stock.<sup>4</sup> Nearly three-quarters is for elementary and secondary education, while the remaining one quarter is for higher education.

In 1970, the federally financed stock of education was only about half the size of the research and development stock, but with steady growth in the intervening decades the education stock is nearly equal to the stock of R&D. Despite a slowdown in growth during the early 1980s, the stock grew at an average annual rate of 4.9 percent from 1970 to 1995, and the expansion of the education stock is projected to continue under this budget.

<sup>4</sup>For estimates of the total education stock, see Table 2-4 in Chapter 2, "Stewardship: Toward a Federal Balance Sheet."

Table 6-8. NET STOCK OF FEDERALLY FINANCED EDUCATION CAPITAL

(In billions of constant 1987 dollars)

Fiscal Year	Total Education Stock	Elementary and Secondary Education	Higher Education
Five year intervals:			
1960 .....	63	46	16
1965 .....	88	64	23
1970 .....	194	155	39
1975 .....	263	215	49
1980 .....	348	274	74
1985 .....	424	318	105
Annual data:			
1990 .....	541	400	141
1991 .....	559	412	148
1992 .....	575	421	153
1993 .....	600	435	164
1994 .....	622	451	171
1995 .....	649	464	185
1996 est. ....	672	478	194
1997 est. ....	692	490	203

### Methodological Note

This note provides further technical detail about the estimation of the capital stock series presented in Tables 6-5 through 6-8.

As stated previously, the capital stock estimates are very rough approximations. Sources of possible error include:

**The historical outlay series.**—The historical outlay series for physical capital was based on budget records since 1940 and was extended back to 1915 using data from selected sources. There are no consistent outlay data on physical capital for this earlier period, and the estimates are approximations. In addition, the historical outlay series in the budget for physical capital extending back to 1940 may be incomplete. The historical outlay series for the conduct of research and development began in the early 1950s and required selected sources to be extended back to 1940. In addition, separate outlay data for basic research and applied R&D were not available for any years and had to be estimated from obligations and budget authority. For education, data for Federal outlays from the budget were combined with data for non-Federal spending from the institution or jurisdiction receiving Federal funds, which may introduce error because of differing fiscal years and confusion about whether the Federal Government was the original source of funding.

**Price adjustments.**—The prices for the components of the Federal stock of physical, R&D, and education capital have increased through time, but the rates of increase are not accurately known. Estimates of costs in fiscal year 1987 prices were made through the application of price deflators from the National Income and Product Accounts (NIPAs), but these should be considered only approximations of the costs of these assets in 1987 prices. Although source data for the NIPA deflators were revised in January 1996 as part of a comprehensive statistical revision, the revised data were not used for the estimates in this chapter, because detailed historical series on the revised basis were not available in time to be included in the Budget.

**Depreciation.**—The useful lives of physical, R&D, and education capital, as well as the pattern by which they depreciate, are very uncertain. This is compounded by using depreciation rates for broad classes of assets, which do not apply uniformly to all the components of each group. As a result, the depreciation estimates should also be considered approximations.

Research continues on the best methods to estimate these capital stocks. The estimates presented in the text could change as better information becomes available on the underlying investment data and as improved methods are developed for estimating the stocks based on those data.

### Physical Capital Stocks

For many years, current and constant-cost data on the stock of most forms of public and private physical

capital—e.g., roads, factories, and housing—have been estimated annually by the Bureau of Economic Analysis (BEA) in the Department of Commerce. In the January 1996 comprehensive revision of the NIPAs, government investment takes increased prominence. Government investment in physical capital is now measured separately from consumption expenditures, and government consumption includes a measure of the consumption of the existing capital stock. In addition, estimates of depreciation are improved based on the results of recent empirical research.<sup>5</sup>

The BEA data are not directly linked to the Federal budget, do not extend to the years covered by the budget, and do not classify as Federal the capital financed but not owned by the Federal Government. For budgetary purposes, OMB prepares separate estimates.

**Method of estimation.**—The estimates were developed from the OMB historical data base for physical capital outlays and grants to State and local governments for physical capital. These are the same major public physical capital outlays presented in Part I. This data base extends back to 1940 and was supplemented by rough estimates for 1915–1939.

The deflators for Federal, State, and local purchases of durables and structures were used going back to 1940. Specific deflators were not used for subdivisions of durables and structures. There are no specific price indices for public purchases of durables and structures for 1915 through 1939, and estimates were made on the basis of Census Bureau historical statistics on constant price public capital formation. Using these deflators, the outlays were converted to constant fiscal year 1987 dollars.

The resulting series was adjusted for depreciation. The data were depreciated on a straight-line basis over the following assumed useful lives: 46 years for water and power projects; 40 years for other direct Federal construction and capital financed by grants (primarily highways); and 16 years for defense procurement and major nondefense equipment.

### Research and Development Capital Stocks

**Method of estimation.**—The estimates were developed from a data base for the conduct of research and development largely consistent with the data in the Historical Tables. Although there is no consistent time series on basic and applied R&D for defense and nondefense outlays back to 1940, it was possible to estimate the data using obligations and budget authority. The data are for the conduct of R&D only and exclude outlays for physical capital for research and development, because those are included in the estimates of physical capital. Nominal outlays were deflated by the implicit price deflator for gross domestic

<sup>5</sup>The revisions for government investment and depreciation methods are discussed in "Preview of the Comprehensive Revision of the National Income and Product Accounts: Recognition of Government Investment and Incorporation of a New Methodology for Calculating Depreciation", *Survey of Current Business*, September 1995, pp. 33–41. BEA's most recent published estimates of capital stocks, prepared before the revisions, are contained in "Fixed Reproducible Tangible Wealth in the United States", *Survey of Current Business*, August 1994, pp. 54–62.

product (GDP) in fiscal 1987 dollars to obtain estimates of constant dollar R&D spending.

The appropriate depreciation rate of intangible R&D capital is even more uncertain than that of physical capital. Empirical evidence is inconclusive. It was assumed that basic research capital does not depreciate and that applied research and development capital has a ten percent geometric depreciation rate. These are the same assumptions used in a study published by the Bureau of Labor Statistics estimating the R&D stock financed by private industry.<sup>6</sup> Recent experimental work at the Bureau of Economic Analysis, extending estimates of tangible capital stocks to R&D, used slightly different assumptions. This work assumed straight-line depreciation for all R&D over a useful life of 18 years, which is roughly equivalent to a geometric depreciation rate of 11 percent. The slightly higher depreciation rate and its extension to basic research would result in smaller stocks than the method used here.<sup>7</sup>

#### Part IV: ALTERNATIVE CAPITAL BUDGET AND CAPITAL EXPENDITURE PRESENTATIONS

A capital budget would separate Federal expenditures into two categories: spending for investment and all other spending. In this sense, Part I of the present chapter provides a capital budget for the Federal Government, distinguishing outlays that yield long-term benefits from all others. But alternative capital budget presentations have also been suggested.

The Federal budget finances investment for two quite different types of reasons. It invests in capital—such as office buildings, computers, and weapons systems—that primarily contributes to its ability to provide governmental services to the public; some of these services, in turn, are designed to increase economic growth. And it invests in capital—such as highways, education, and research—that contributes more directly to the economic growth of the Nation. Most of the capital in the second category, unlike the first, is not owned or controlled by the Federal Government. In the discussion that follows, the first is called “Federal capital” and the second is called “national capital.” Table 6-9 compares total Federal investment as defined in this chapter with investment in national capital and with that part of investment in Federal capital which was defined as “fixed assets” in Part II of this chapter.

Capital budgets and other changes in Federal budgeting have been suggested from time to time for the Government’s investment in both Federal and national capital. These proposals differ widely in coverage, depending on the rationale for the suggestion. Some would include all the investment shown in Table 6-1, or more, whereas others would be narrower in various ways. These proposals also differ in other respects, such as whether investment would be financed by borrowing and whether the non-investment budget would nec-

#### Education Capital Stocks

**Method of estimation.**—The estimates of the federally financed education capital stock in Table 6-8 were calculated by first estimating the Nation’s total stock of education capital, based on the current replacement cost of the total years of education of the population. To derive the Federal share of this total stock, the Federal share of total educational expenditures was applied to the total amount. The percent in any year was estimated by averaging the prior years’ share of Federal education outlays in total education costs. For more information, refer to the technical note in Chapter 2, “Stewardship: Toward a Federal Balance Sheet.”

The stock of capital estimated in Table 6-8 is based only on spending for education. Stocks created by other human capital investment outlays included in Table 6-1, such as job training and vocational rehabilitation, were not calculated because of the lack of historical data prior to 1962 and the absence of estimates of depreciation rates.

essarily be balanced. Some of these proposals are discussed below and illustrated by alternative capital budget and other capital expenditure presentations, although the discussion does not address matters of implementation such as the effect on the Budget Enforcement Act. The planning and budgeting process for fixed assets, which is a different subject, is discussed in Part II of this chapter together with the steps this Administration is taking to improve it.

#### Investment in Federal Capital

The goal of investment in Federal capital is to deliver Government services as efficiently and effectively as possible. The Congress allocates resources to Federal agencies to accomplish a wide variety of programmatic goals. Because these goals are diverse and most are not measured in dollars, they are difficult to compare with each other. Policy judgments must be made as to their relative importance.

Once amounts have been allocated for one of these goals, however, analysis may be able to assist in choosing the most efficient and effective means of delivering service. This is the context in which decisions are made on the amount of investment in Federal capital. For example, budget proposals for the Department of Justice must consider whether to increase the number of FBI agents, the amount of justice assistance grants to State and local governments, or the number of prisons in order to accomplish the department’s objectives. The optimal amount of investment in Federal capital derives from these decisions. There is no efficient target for total investment in Federal capital as such.

The universe of Federal capital encompasses federally owned fixed assets. It excludes Federal grants to States

<sup>6</sup>See U.S. Department of Labor, Bureau of Labor Statistics, *The Impact of Research and Development on Productivity Growth*, Bulletin 2331, September 1989.

<sup>7</sup>See “A Satellite Account for Research and Development”, *Survey of Current Business*, November 1994, pp. 37-71.

Table 6-9. ALTERNATIVE DEFINITIONS OF INVESTMENT OUTLAYS, 1997

(In millions of dollars)

	All Federal investment	Fixed assets	National capital
Construction and rehabilitation:			
Grants:			
Transportation .....	24,440	.....	24,440
Natural resources and environment .....	2,403	.....	2,400
Community and regional development .....	6,075	.....	1,068
Housing assistance .....	6,278	.....	.....
Other grants .....	1,040	.....	155
Direct Federal:			
National defense .....	4,317	4,065	.....
General science, space, and technology .....	469	295	469
Natural resources and environment .....	3,410	1,701	3,200
Energy .....	1,604	1,403	1,604
Transportation .....	500	68	500
Veterans and other health facilities .....	1,450	748	1,450
Postal Service .....	860	.....	860
GSA real property activities .....	1,349	1,336	.....
Other construction .....	2,152	892	564
Total construction and rehabilitation .....	56,347	10,508	36,710
Acquisition of major equipment (direct):			
National defense .....	44,189	1,945	.....
Postal Service .....	1,042	.....	1,042
Air transportation .....	1,946	1,896	1,946
Other .....	4,201	3,761	2,500
Total major equipment .....	51,378	7,602	5,488
Purchase or sale of land and structures .....	346	.....	.....
Total physical investment .....	108,071	18,110	42,198
Research and development:			
Defense .....	37,292	.....	1,226
Nondefense .....	31,796	.....	31,411
Total research and development .....	69,088	.....	32,637
Education and training .....	44,554	.....	44,067
Total investment outlays .....	221,713	18,110	118,902

for infrastructure, such as highways, and it excludes intangible investment, such as education and research. Investment in Federal capital in 1997 is estimated to be \$68 billion, or 31 percent of the total Federal investment outlays shown in table 6-1. Of the investment in Federal capital, 72 percent is for defense and 28 percent for nondefense purposes.

### ***A Capital Budget for Fixed Assets***

Discussion of a capital budget has often centered on the part of Federal capital called "fixed assets" in Part II of this chapter—buildings, other construction, and equipment that support the delivery of domestic Federal services. This includes capital commonly available from the commercial sector, such as office buildings, computers, military family housing, veterans hospitals, research and development facilities, and associated equipment; it also includes nondefense special purpose capital such as space stations and dams. This definition excludes Federal capital for weapons systems and military bases, and capital that the Federal Government has financed but does not own.<sup>8</sup>

<sup>8</sup>This definition of "fixed assets" is broader than the definition used in last year's budget, as explained in Part II of this chapter. Expenditures for fixed assets in 1997 under this definition are \$18 billion, as shown in tables 6-9 and 6-10, which is around two and

Some capital budget proposals would partition the unified budget into a capital budget, an operating budget, and a total budget. Table 6-10 illustrates such a capital budget for fixed assets as defined above. It is accompanied by an operating budget and a total budget. The operating budget consists of all expenditures except those included in the capital budget, plus depreciation on the stock of assets of the type purchased through the capital budget. The capital budget consists of expenditures for fixed assets and, on the income side of the account, depreciation. The total budget is the present unified budget, largely based on cash for its measure of transactions, which records all outlays and receipts of the Federal Government. It consolidates the operating and capital budgets by adding them together and netting out depreciation as an intragovernmental transaction. The difference between the operating budget deficit and the unified budget deficit is small, reflecting both the relatively small Federal investment in new fixed assets and the offsetting effect of depreciation on the existing stock. The figures in table 6-10 and the subsequent tables of this section are rough estimates and intended to be illustrative.

a half times larger than under the previous definition.

Table 6-10. CAPITAL, OPERATING, AND UNIFIED BUDGETS: FIXED ASSETS, 1997<sup>1</sup>

(In billions of dollars)

<b>Operating Budget</b>	
Receipts .....	1,495
Expenses:	
Depreciation .....	20
Other .....	1,617
Subtotal, expenses .....	1,637
Surplus or deficit (-) .....	-142
<b>Capital Budget</b>	
Income: depreciation .....	20
Capital expenditures .....	18
Surplus or deficit (-) .....	2
<b>Unified Budget</b>	
Receipts .....	1,495
Outlays .....	1,635
Surplus or deficit (-) .....	-140

<sup>1</sup>Historical data to estimate the capital stocks and calculate depreciation are not readily available for fixed assets. Depreciation estimates were based on the assumption that outlays for fixed assets were a constant percentage of the larger categories in which such outlays were classified. They are also subject to the limitations discussed in Part III of this chapter.

### **Budget Discipline and a Capital Budget**

Many proposals for a capital budget, though not all, would effectively dispense with the unified budget and make expenditure decisions on fixed asset acquisitions in terms of the operating budget instead. When the Government proposed to purchase a fixed asset, the operating budget would include only the estimated depreciation. For example, suppose that an agency proposed to buy a \$50 million building at the beginning of the year with an estimated life of 25 years and with depreciation calculated by the straightline method. Operating expense in the budget year would increase by \$2 million, or only 4 percent of the asset cost. The same amount of depreciation would be recorded as an increase in operating expense for each year of the asset's life.<sup>9</sup>

Recording the annual depreciation in the operating budget each year would provide little control over the decision about whether to invest in the first place. Most Federal investments are sunk costs and as a practical matter cannot be recovered by selling or renting the asset. At the same time, there is a significant risk that the need for a fixed asset may change over a period of years, because either the need was not permanent, it was initially misjudged, or other needs became more important. Since the cost is sunk, however, control cannot be exercised later on by comparing the annual benefit of the asset services with depreciation and interest and then selling the asset if its annual services are not worth this expense. Control can only be exercised up front when the Government commits itself to

<sup>9</sup>The amount of depreciation recorded as an expense in the budget year might be overstated by this illustration. First, assets are mostly purchased after the beginning of the year, in which case less than a full year's depreciation would be recorded. Second, assets may be constructed or built to order, in which case no depreciation would be recorded until the work was completed and the asset put into service. This could be several years after the initial expenditure.

the full sunk cost. By spreading the real cost of the project over time, however, use of the operating budget for expenditure decisions would make the budgetary cost of the fixed asset appear very cheap when decisions were being made that compared it to alternative expenditures. As a result, there would be an incentive to purchase fixed assets with little regard for need, and also with little regard for the least-cost method of acquisition.

A budget is a financial plan for allocating resources—deciding how much the Federal Government should spend in total, program by program, and for the parts of each program. The budgetary system provides a process for proposing policies, making decisions, implementing them, and reporting the results. The budget needs to measure costs accurately so that decision makers can compare the cost of a program with its benefit, the cost of one program with another, and the cost of alternative methods of reaching a specified goal. These costs need to be fully included in the budget up front, when the spending decision is made, so that executive and congressional decision makers have the information and the incentive to take the total costs into account.

The unified budget does this for investment. By recording investment on a cash basis, it causes the total cost to be compared up front in a rough and ready way with the total expected future net benefits. Since the budget measures only cost, the benefits with which these costs are compared, based on policy makers' judgment, must be presented in supplementary materials. Such a comparison of total cost with benefits is consistent with the formal method of cost-benefit analysis of capital projects in government, in which the full cost of a fixed asset as the cash is paid out is compared with the full stream of future benefits (all in terms of present values).<sup>10</sup> This comparison is also consistent with common business practice, in which capital budgeting decisions for the most part are made by comparing cash flows. The cash outflow for the full purchase price is compared with expected future cash inflows, either through a relatively sophisticated technique of discounted cash flows—such as net present value or internal rate of return—or through cruder methods such as payback periods.<sup>11</sup> Regardless of the specific technique adopted, it usually requires comparing future returns with the entire cost of the asset up front—not spread over time through annual depreciation.<sup>12</sup>

<sup>10</sup>For example, see Edward M. Gramlich, *A Guide to Benefit-Cost Analysis* (2nd ed.; Englewood Cliffs: Prentice Hall, 1990), chap. 6; or Joseph E. Stiglitz, *Economics of the Public Sector* (2nd ed.; New York: Norton, 1988), chap. 10. This theory is applied in formal OMB instructions to Federal agencies in OMB Circular No. A-94, *Guidelines and Discount Rates for Benefit-Cost Analysis of Federal Programs* (October 29, 1992). General Accounting Office, *Discount Rate Policy*, GAO/OCE-17.1.1 (May 1991), discusses the appropriate discount rate for such analysis but not the foundation of the analysis itself, which is implicitly assumed.

<sup>11</sup>For a full textbook analysis of capital budgeting techniques in business, see Harold Bierman, Jr., and Seymour Smidt, *The Capital Budgeting Decision* (7th ed.; New York: Macmillan, 1988). Shorter analyses may be found, for example, in Charles T. Horngren and George Foster, *Cost Accounting* (6th ed.; Englewood Cliffs: Prentice-Hall, 1987), chap. 19 and 20; and in Surendra S. Singhvi, "The Capital Budgeting Process" and "The Capital Expenditure Evaluation Methods," chap. 19 and 20 in Robert Rachlin and H.W. Allen Sweeney, *Handbook of Budgeting* (3rd ed.; New York: Wiley, 1993).

<sup>12</sup>A recent survey of business practice found that such techniques are predominant. See Glenn H. Petry and James Sprow, "The Theory and Practice of Finance in the 1990s," *The Quarterly Review of Economics and Finance*, vol. 33 (Winter 1993), pp. 359-82. Petry

### **Practice Outside the Federal Government**

The proponents of making investment decisions on the basis of an operating budget with depreciation have sometimes claimed that this is the common practice outside the Federal Government. However, while the practice of others may differ from the Federal budget and the terms “capital budget” and “capital budgeting” are often used, these terms do not normally mean that fixed asset acquisitions are decided on the basis of annual depreciation cost. The use of these terms in business and State government also does not mean that businesses and States finance all their investment by borrowing. Nor does it mean that under a capital budget the extent of borrowing by the Federal Government to finance investment would be limited by the same forces that constrain business and State borrowing for investment.

**Private business firms** call their investment decision making process “capital budgeting,” and they record the resulting planned expenditures in a “capital budget.” However, decisions are normally based on up-front comparisons of the cash outflows needed to make the investment with the resulting cash inflows expected in the future, and the capital budget records the period-by-period cash outflows proposed for capital projects.<sup>13</sup> This supports the business’s goal of deciding upon and controlling the use of its resources.

The cash-based focus of business budgeting for capital is in contrast to business financial statements—the income statement and balance sheet—which use accrual accounting for a different purpose, namely to record how well the business is meeting its objectives of earning profit and accumulating wealth for its owners. For this purpose, the income statement shows the profit in a year from earning revenue net of the expenses incurred. These expenses include depreciation, which is an allocation of the cost of fixed assets over their estimated useful life. With similar objectives in mind, the Federal Accounting Standards Advisory Board (FASAB) has proposed the use of depreciation on general property, plant, and equipment owned by the Federal Government as a measure of expense in financial statements and cost accounting for Federal agencies.<sup>14</sup>

Businesses finance investment from net income as well as borrowing. When they borrow to finance investment, they are constrained in ways that Federal borrowing is not. The amount that a business borrows is limited by its own profit motive and the market’s assessment of its capacity to repay. The greater a business’s indebtedness, other things equal, the more risky is any additional borrowing and the higher is

the cost of funds it must pay. Since the profit motive ensures that a business will not want to borrow unless the expected return is at least as high as the cost of funds, the amount of investment that a business will want to finance is limited; and it has an incentive to borrow only for projects where the expected return is as high or higher than the cost of funds. Furthermore, if the risk is great enough, a business may not be able to find a lender.

No such constraint limits the Federal Government—either in the total amount of its borrowing for investment, or in its choice of which assets to buy—because of its sovereign power to tax. It can tax to pay for investment; and, if it borrows, its power to tax ensures that the credit market will judge U.S. Treasury securities free from any risk of default even if it borrows “excessively” or for projects that do not seem worthwhile.

Most **States** also have a “capital budget,” but the operating budget is not like the operating budget envisaged by proponents of making Federal investment decisions on the basis of depreciation. State capital budgets differ widely in many respects but generally relate some of the State’s purchases of fixed assets to borrowing and other earmarked means of financing. For the debt-financed portion of investment, the interest and repayment of principal are usually recorded in the operating budget. For the portion of investment purchased in the capital budget but financed by Federal grants or by taxes, which may be substantial, State operating budgets do not record any amount. No State operating budget is charged for depreciation.<sup>15</sup>

States also do not record depreciation expense in the financial accounting statements for governmental funds. They record depreciation expense only in their proprietary (commercial-type) funds and in those trust funds where net income, expense, or capital maintenance is measured.<sup>16</sup>

State borrowing to finance investment, like business borrowing, is subject to limitations that do not apply to Federal borrowing. Like business borrowing, it is constrained by the credit market’s assessment of the State’s capacity to repay. Furthermore, it is usually designated for specified investments, and it is almost always subject to constitutional limits or referendum requirements.

Other **developed nations** tend to show a more systematic breakdown between investment and operating expenditures within their budgets than does the United States, even while they record capital expenditures on a cash basis within the same budget totals. For example, the United Kingdom shows the capital spending

and Sprow also found that such techniques are recommended by the most widely used textbooks in managerial finance.

<sup>13</sup>A business capital budget is depicted in Glenn A. Welsch *et al.*, *Budgeting: Profit Planning and Control* (5th ed.; Englewood Cliffs: Prentice Hall, 1988), pp. 396–99.

<sup>14</sup>FASAB, Statement of Recommended Accounting Concepts No. 6, *Accounting for Property, Plant, and Equipment* (September 1995), pp. 7–14 and 34–36. Depreciation would not be used as a measure of expense for weapons systems, space exploration equipment, and other “Federal mission property” or for heritage assets. Depreciation also would not be used as a measure of expense for physical property financed by the Federal Government but owned by State and local governments, or for investment that the Federal Government financed in human capital and research and development.

<sup>15</sup>The characteristics of State capital budgets were examined in a survey of State budget officers for all 50 States in 1986. See Lawrence W. Hush and Kathleen Peroff, “The Variety of State Capital Budgets: A Survey,” *Public Budgeting and Finance* (Summer 1988), pp. 67–79. More detailed results are available in an unpublished OMB document, “State Capital Budgets” (July 7, 1987). Two GAO reports examined State capital budgets and reached similar conclusions on the issues in question. See *Budget Issues: Capital Budgeting Practices in the States*, GAO/AFMD-86-63FS (July 1986) and *Budget Issues: State Practices for Financing Capital Projects*, GAO/AFMD-89-64 (July 1989).

<sup>16</sup>Governmental Accounting Standards Board (GASB), *Codification of Governmental Accounting and Financial Reporting Standards as of June 30, 1995*, sections 1100.107 and 1400.114–1400.118.

within each agency total and displays the sum of capital spending for the government as a whole. However, a survey by the Congressional Budget Office found that all developed nations except Chile and New Zealand budget on a cash basis.<sup>17</sup> New Zealand, moreover, while budgeting on an accrual basis that generally includes depreciation, requires the equivalent of appropriations for the full cost up front before a department can make net additions to its fixed assets; and it budgets for infrastructure assets that it owns on the basis of cash expenditure rather than depreciation.<sup>18</sup> Some countries—including Sweden, Denmark, and Finland—formerly had separate capital budgets but abandoned them a number of years ago.<sup>19</sup>

### Conclusions

It is for reasons such as these that the General Accounting Office issued a report a little over two years ago that criticized budgeting for capital in terms of depreciation. Although the criticisms were in the context of what is termed “national capital” in this chapter, they apply equally to “Federal capital.”

“Depreciation is not a practical alternative for the Congress and the administration to use in making decisions on the appropriate level of spending intended to enhance the nation’s long-term economic growth for several reasons. Currently, the law requires agencies to have budget authority before they can obligate or spend funds. Unless the full amount of budget authority is appropriated up front, the ability to control decisions when total resources are committed to a particular use is reduced. Appropriating only annual depreciation, which is only a fraction of the total cost of an investment, raises this control issue.”<sup>20</sup>

After further study of the role of depreciation in budgeting, GAO reiterated that conclusion in another study last year.<sup>21</sup> “The greatest disadvantage ... was that depreciation would result in a loss of budgetary control under an obligation-based budgeting system.”<sup>22</sup> Although this study also focused primarily on what is termed “national capital” in this chapter, the analysis applies equally to “Federal capital” as well.

## Investment in National Capital

### A Target for National Investment

The Federal Government’s investment in national capital has a much broader and more varied form than

its investment in Federal capital. The Government’s goal is to support and accelerate sustainable economic growth for the Nation as a whole and in some instances for specific regions or groups of people. The Government’s investment concerns for the Nation are two-fold:

- *The effect of its own investment in national capital on the output and income that the economy can produce.* Reducing expenditure on consumption and increasing expenditure on investment that supports economic growth is a major priority for the Administration. It has reordered priorities in its budgets by proposing increases in selected investments.
- *The effect of Federal taxation, borrowing, and other policies on private investment.* The Administration’s deficit reduction policy has brought about an expansion of private investment, most notably in producers’ durable equipment.

In its report a little over two years ago, *Incorporating an Investment Component in the Federal Budget*, the General Accounting Office (GAO) recommended establishing an investment component within the unified budget—but not a separate capital budget or the use of depreciation—for this type of investment.<sup>23</sup> GAO defines this investment as “federal spending, either direct or through grants, that is directly intended to enhance the private sector’s long-term productivity.”<sup>24</sup> To increase investment—both public and private—GAO recommended establishing targets for the level of Federal investment and for a declining path of unified budget deficits over time.<sup>25</sup> Such a target for investment in national capital would focus attention on policies for growth, encourage a conscious decision about the overall level of growth-enhancing investment, and make it easier to set spending priorities in terms of policy goals for aggregate formation of national capital. GAO reiterated its recommendation in another report last year.<sup>26</sup>

Table 6–11 illustrates the unified budget reorganized as GAO recommends to have a separate component for investment in national capital. This component is roughly estimated to be \$119 billion in 1997. It includes infrastructure outlays financed by Federal grants to State and local governments, such as highways and sewer projects, as well as direct Federal purchases of infrastructure, such as electric power generation equipment. It also includes intangible investment for non-defense research and development, for basic research financed through defense, and for education and training. Much of this expenditure consists of grants and credit assistance to State and local governments, nonprofit organizations, or individuals. Only 12 percent of national investment consists of assets to be owned by the Federal Government. Military investment and some “fixed assets” as defined previously are excluded, because that investment does not primarily enhance economic growth.

<sup>17</sup>Robert W. Hartman, Statement before the Subcommittee on Economic Development, Committee on Public Works and Transportation, U.S. House of Representatives (May 26, 1993). Hartman stated: “to our knowledge, only two developed countries, Chile and New Zealand, recognize depreciation in their budgets.”

<sup>18</sup>New Zealand’s use of depreciation in its budget is discussed in GAO, *Budget Issues: The Role of Depreciation in Budgeting for Certain Federal Investments*, GAO/AIMD-95-34 (February 1995), pp. 13 and 16–17.

<sup>19</sup>The budgets in Sweden, Great Britain, Germany, and France are described in GAO, *Budget Issues: Budgeting Practices in West Germany, France, Sweden, and Great Britain*, GAO/AFMD-87-8FS (November 1986). Sweden had separate capital and operating budgets from 1937 to 1981, together with a total combined budget from 1956 onwards. The reasons for abandoning the capital budget are discussed briefly in the GAO report and more extensively by a government commission established to recommend changes in the Swedish budget system. One reason was that borrowing was no longer based on the distinction between current and capital budgets. See Sweden, Ministry of Finance, *Proposal for a Reform of the Swedish Budget System: A Summary of the Report of the Budget Commission Published by the Ministry of Finance* (Stockholm, 1974), chapter 10.

<sup>20</sup>GAO, *Budget Issues: Incorporating an Investment Component in the Federal Budget*, GAO/AIMD-94-40 (November 1993), p. 11. GAO had made the same recommendation in earlier reports but with less extensive analysis.

<sup>21</sup>GAO, *Budget Issues: The Role of Depreciation in Budgeting for Certain Federal Investments*, GAO/AIMD-95-34 (February 1995), p. 19.

<sup>22</sup>*Ibid.*, p. 17. Also see pp. 1–2 and 16–19.

<sup>23</sup>*Incorporating an Investment Component in the Federal Budget*, pp. 1–2, 9–10, and 15.

<sup>24</sup>*Ibid.*, pp. 1 and 5.

<sup>25</sup>*Ibid.*, pp. 2 and 13–16.

<sup>26</sup>*The Role of Depreciation in Budgeting for Certain Investments*, pp. 2 and 19–20.

**Table 6-11. UNIFIED BUDGET WITH NATIONAL INVESTMENT COMPONENT, 1997**

(In billions of dollars)

Receipts .....	1,495
Outlays:	
National investment .....	119
Other .....	1,516
Subtotal, outlays .....	1,635
Surplus or deficit (-) .....	-140

### ***A Capital Budget for National Investment***

Table 6-12 roughly illustrates what a capital budget and operating budget would look like under this definition of investment—although it must be emphasized that this is *not* GAO's recommendation. Some proponents of a capital budget would make spending decisions within the framework of such a capital budget and operating budget. But the limitations that apply to the use of depreciation in deciding on investment decisions for Federal capital apply even more strongly in deciding on investment decisions for national capital. Most national capital is neither owned nor controlled by the Federal Government. Such investments are sunk costs completely and can be controlled only by decisions made up front when the Government commits itself to the expenditure.<sup>27</sup>

**Table 6-12. CAPITAL, OPERATING, AND UNIFIED BUDGETS: NATIONAL CAPITAL, 1997<sup>1</sup>**

(In billions of dollars)

<b>Operating Budget</b>	
Receipts .....	1,464
Expenses:	
Depreciation <sup>2</sup> .....	72
Other .....	1,516
Subtotal, expenses .....	1,589
Surplus or deficit (-) .....	-125
<b>Capital Budget</b>	
Income:	
Depreciation <sup>2</sup> .....	72
Earmarked tax receipts <sup>3</sup> .....	31
Subtotal, income .....	103
Capital expenditures .....	119
Surplus or deficit (-) .....	-15
<b>Unified Budget</b>	
Receipts .....	1,495
Outlays .....	1,635
Surplus or deficit (-) .....	-140

<sup>1</sup>For the purpose of this illustrative table only, education and training outlays are arbitrarily depreciated over 30 years by the straight-line method. This differs from the treatment of education and training elsewhere in this chapter and in Chapter 2. All depreciation estimates are subject to the limitations discussed in Part III of this chapter.

<sup>2</sup>Excludes depreciation on capital financed by earmarked tax receipts allocated to the capital budget.

<sup>3</sup>Consists of tax receipts of the highway and airport and airways trust funds, which are user charges earmarked for financing capital expenditures.

<sup>27</sup>GAO's conclusions about the loss of budgetary control that were quoted at the end of the section on Federal capital came from studies that predominantly considered "national capital."

In addition to these basic limitations, the definition of investment is more malleable for national capital than Federal capital. Many programs promise long-term intangible benefits to the Nation, and depreciation rates are much harder to determine for intangible investment such as research and education than they are for physical investment such as highways and office buildings. These and other definitional questions are hard to resolve. The answers could significantly affect budget decisions, because they would determine whether the budget would record all or only a small part of the cost of a decision when policy makers were comparing the budgetary cost of a project with their judgment of its benefits. The process of reaching an answer with a capital budget would open the door to manipulation, because there would be an incentive to make the operating expenses and deficit look smaller by classifying outlays as investment and using low depreciation rates. This would "justify" more spending by the program or the Government overall.<sup>28</sup>

### ***A Capital Budget and the Analysis of Saving and Investment***

Data from the Federal budget may be classified in many different ways, including analyses of the Government's direct effects on saving and investment. As Parts I and III of this chapter have shown, the unified budget provides data that can be used to calculate Federal investment outlays and federally financed capital stocks. However, the budget totals themselves do not make this distinction. In particular, the budget surplus or deficit does not measure the Government's contribution to the nation's net saving (after depreciation). A capital budget, it is contended, is needed for this purpose.

This purpose, however, is being fulfilled beginning this year by the Federal sector of the national income and product accounts (NIPAs). The NIPA Federal sector is an accounting translation of the budget designed to measure the impact of Federal receipts, expenditures, and deficit on the national economy. It is part of an integrated set of measures of aggregate U.S. economic activity that is prepared by the Bureau of Economic Analysis in the Department of Commerce in order to measure gross domestic product (GDP), the income generated in its production, and many other variables used in macroeconomic analysis. The NIPA Federal sector for past periods is published monthly in the *Survey of Current Business*. Estimates for the President's proposals through the budget year are normally published in the budget documents but this year will only appear in a later issue of the *Survey of Current Business*.<sup>29</sup> The NIPA translation of the budget, rather than the budget itself, is ordinarily used by economists to ana-

<sup>28</sup>These problems are also pointed out in GAO, *Incorporating an Investment Component in the Federal Budget*, pp. 11-12. They are discussed more extensively with respect to highway grants, research and development, and human capital in GAO, *The Role of Depreciation in Budgeting for Certain Federal Investments*, pp. 11-14. GAO found no government that budgets for the depreciation of infrastructure (whether or not owned by that government), human capital, or research and development (except that New Zealand budgets for the depreciation of research and development if it results in a product that is intended to be used or marketed).

<sup>29</sup>See Chapter 17 of this volume, "National Income and Product Accounts."

lyze the effect of Government fiscal policy on the aggregate economy.<sup>30</sup>

Until this year the NIPA Federal sector did not divide government purchases of goods and services between consumption and investment. With the recent comprehensive revision of the national income and product accounts, it now makes that distinction.<sup>31</sup> The revised NIPA Federal sector is a current account or an operating account for the Federal Government. It excludes expenditures for structures and equipment owned by the Federal Government; it includes depreciation on the federally owned stock of structures and equipment as part of the Federal Government's consumption. It does this for a broad definition of federally owned structures and equipment, both "fixed assets" such as included in table 6-10 and other types such as military equipment.<sup>32</sup> The "current surplus or deficit" of the Federal Government thus measures its direct accounting contribution to net saving in the economy for the definition of investment that is employed. A capital budget is not needed for this purpose.

### Borrowing to Finance a Capital Budget

A further issue raised by a capital budget is the financing of capital expenditures. Some have argued that the Government ought to balance the operating budget and borrow to finance the capital budget—capital expenditures less depreciation. The rationale is that if the Government borrows for net investment and the rate of return exceeds the interest rate, the additional debt does not add a burden onto future generations. Instead, the burden of paying interest on the debt and repaying its principal is spread over the generations that will benefit from the investment. The additional debt is "justified" by the additional assets.

This argument is at best a justification to borrow to finance *net* investment, after depreciation is subtracted from *gross* outlays, not to borrow to finance *gross* investment. To the extent that capital is used up during the year, there are no additional assets to justify additional debt. If the Government borrows to finance *gross* investment, the additional debt exceeds the additional capital assets. The Government is thus adding onto the amount of future debt service without providing the additional capital that would produce the additional income needed to service that debt.

This justification, furthermore, requires that depreciation be measured in terms of current cost, not historical cost. When prices change, historical cost depreci-

ation does not measure the extent to which the capital stock is used up each year.

Table 6-12 shows that the operating deficit, defined to be net of current cost depreciation, would not be a great deal less than the unified budget deficit—\$125 billion in 1997 compared to \$140 billion. Depreciation (plus the excise taxes earmarked to finance capital expenditures for highways and airports and airways<sup>33</sup>) is high relative to gross new capital outlays, because the stock of national capital has not been growing very fast. This justification for borrowing would not justify the Federal Government borrowing very much to finance its planned investment.

Even with depreciation calculated in current cost, the rationale for borrowing to finance net investment is not persuasive. The Federal Government, unlike a business or household, is responsible not only for its own affairs but also for the general welfare of the Nation. To maintain and accelerate national economic growth and development, the Government needs to sustain private investment as well as its own national investment. For more than the last decade, however, net national saving and investment have been low, both by historical standards and in comparison to the amounts needed to achieve the Administration's goals for accelerated growth.

To the extent that the Government finances its own investment in a way that results in lower private investment, the net increase of total investment in the economy is less than the increase from the additional Federal capital outlays alone. The net increase in total investment is significantly less if the Federal investment is financed by borrowing than if it is financed by taxation, because borrowing primarily draws upon the saving available for private (and State and local) investment whereas much of taxation instead comes out of private consumption. Therefore, the net effect of Federal investment on economic growth would be reduced if it were financed by borrowing. This would be the result even if the rate of return on Federal investment was higher than the rate of return on private investment. For example, if a Federal investment that yielded a 15 percent rate of return crowded out private investment that yielded 10 percent, the net social return would still be positive but it would only be 5 percent.<sup>34</sup>

The first budget of this Administration was a bold step to increase the saving available for private investment while also increasing Federal investment for national capital. The deficit has been cut nearly in half during the past three years, and available resources have been shifted to investment in education and training and in science and technology. The present budget goes further, proposing budget balance by 2002 while protecting high priority investments. A capital budget is not a justification to relax current and proposed budget constraints. Any easing would undo the gains

<sup>30</sup>For a discussion of the NIPA Federal sector and its relationship to the budget prior to the recent comprehensive revision, see *Analytical Perspectives, Budget of the United States Government, Fiscal Year 1996*, Chapter 19, "National Income and Product Accounts," pp. 267-70.

<sup>31</sup>This distinction is also made in the national income accounts of most other countries and in the System of National Accounts (SNA), which is guidance prepared by the United Nations and other international organizations. Definitions of investment may vary. Other countries and the SNA do not include the purchase of military equipment as investment.

<sup>32</sup>The revised NIPA Federal sector is explained in *Survey of Current Business*, "Preview of the Comprehensive Revision of the National Income and Product Accounts: Recognition of Government Investment and Incorporation of a New Methodology for Calculating Depreciation" (September 1995), pp. 33-39. Investment does not include expenditures on research and development or on education and training. The NIPA State and local sector has been revised in the same way and includes depreciation on structures and equipment owned by State and local governments but financed by Federal grants.

<sup>33</sup>The operating deficit would be about \$15 billion less if depreciation were used instead of earmarked excise taxes for highways and airports and airways.

<sup>34</sup>GAO considered deficit financing of investment but did not recommend it. See *Incorporating an Investment Component in the Federal Budget*, pp. 12-13.

from the deficit reduction already achieved and the further gains from balancing the budget by 2002.

### Part V: SUPPLEMENTAL PHYSICAL CAPITAL INFORMATION

The Federal Capital Investment Program Information Act of 1984 (Title II of Public Law 98-501; hereafter referred to as the Act) requires that the budget include projections of Federal physical capital spending and information regarding recent assessments of public civilian physical capital needs. This section is submitted to fulfill that requirement.

This section is organized in two major parts. The first part projects Federal outlays for public physical capital and the second part presents information regarding public civilian physical capital needs.

#### Projections of Federal Outlays For Public Physical Capital

Federal public physical capital spending is defined here to be the same as the "major public physical capital investment" category in Part I of this chapter. It covers spending for construction and rehabilitation, acquisition of major equipment, and other physical assets. This section excludes outlays for human capital, such as the conduct of education, training, and research.

The projections are done generally on a current services basis, which means they are based on 1996 enacted appropriations and adjusted for inflation in later years.

Federal public physical capital spending was \$118.9 billion in 1995 and is projected to increase to \$126.2 billion by 2006 on a current services basis. The largest components are for national defense and for roadways and bridges, which together accounted for more than two-thirds of Federal public physical capital spending in 1995.

Table 6-13 shows projected current services outlays for Federal physical capital by the major categories specified in the Act. Total Federal outlays for transportation-related physical capital were \$27.7 billion in 1995, and current services outlays are estimated to increase to \$31.6 billion by 2006. Outlays for nondefense housing and buildings were \$10.7 billion in 1995 and are estimated to increase to \$14.8 billion by 2006. Physical capital outlays for other nondefense categories were \$20.7 billion in 1995 and are projected to be \$25.4 billion by 2006. For national defense, this spending was \$59.9 billion in 1995 and is estimated on a current services basis to be \$54.4 billion in 2006.

Table 6-13. CURRENT SERVICES OUTLAY PROJECTIONS FOR FEDERAL PHYSICAL CAPITAL SPENDING

(In billions of dollars)

	1995 actual	Estimate										
		1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Nondefense:												
Transportation-related categories:												
Roadways and bridges .....	19.2	20.1	19.6	19.8	19.8	20.0	20.3	20.8	20.9	21.7	22.2	22.9
Airports and airway facilities .....	4.5	3.7	3.6	3.8	3.7	3.8	3.9	4.0	3.9	4.0	4.2	4.3
Mass transportation systems .....	3.6	3.8	3.4	3.4	3.3	3.4	3.5	3.6	3.7	3.8	3.9	4.0
Railroads .....	0.4	0.5	0.6	0.6	0.4	0.4	0.5	0.5	0.5	0.5	0.5	0.5
Subtotal, transportation .....	27.7	28.1	27.1	27.6	27.2	27.7	28.2	28.7	29.0	30.0	30.7	31.6
Housing and buildings categories:												
Federally assisted housing .....	6.4	6.7	7.5	7.4	7.5	7.7	7.9	8.1	8.4	8.7	9.0	9.3
Hospitals .....	1.4	1.8	1.7	1.7	1.6	1.7	1.7	1.7	1.8	1.9	1.9	2.0
Public buildings <sup>1</sup> .....	2.8	3.0	3.0	2.8	3.1	3.1	3.2	3.3	3.2	3.3	3.4	3.5
Subtotal, housing and buildings categories .....	10.7	11.5	12.1	11.9	12.2	12.5	12.8	13.2	13.5	13.9	14.3	14.8
Other nondefense categories:												
Wastewater treatment and related facilities .....	2.8	3.0	3.0	2.9	2.9	3.0	3.1	3.1	3.2	3.3	3.4	3.5
Water resources projects .....	2.2	2.3	2.0	1.9	1.9	2.0	2.0	2.1	2.1	2.2	2.2	2.3
Space and communications facilities .....	2.9	3.4	3.5	3.5	3.5	3.6	3.7	3.9	4.0	4.1	4.2	4.3
Energy programs .....	3.2	2.4	2.3	2.4	2.5	2.5	2.6	2.7	2.7	2.8	2.9	3.0
Community development programs .....	5.0	5.9	5.7	5.6	5.6	5.6	5.8	5.9	6.0	6.2	6.4	6.5
Other nondefense .....	4.5	4.8	4.9	2.5	4.9	5.1	5.2	5.4	5.3	5.4	5.6	5.8
Subtotal, other nondefense .....	20.7	21.7	21.5	18.8	21.3	21.8	22.5	23.0	23.4	24.0	24.7	25.4
Subtotal, nondefense .....	59.0	61.3	60.8	58.3	60.7	62.0	63.4	64.9	65.9	67.9	69.8	71.8
National defense .....	59.9	52.6	49.1	47.6	48.7	49.5	50.5	48.9	50.2	51.6	53.0	54.4
Total .....	118.9	113.9	109.8	105.9	109.4	111.5	114.0	113.8	116.0	119.5	122.7	126.2

<sup>1</sup> Excludes outlays for public buildings that are included in other categories in this table.

Table 6-14 shows current services projections on a constant dollar basis, using fiscal year 1987 as the base year.

For outlay details for most programs, see the items included in major public physical capital in tables 6-2 and 6-3.

### Public Civilian Capital Needs Assessments

The Act requires information regarding the state of major Federal infrastructure programs, including highways and bridges, airports and airway facilities, mass transit, railroads, federally assisted housing, hospitals, water resources projects, and space and communications investments. Funding levels, long-term projections, policy issues, needs assessments, and critiques, are required for each category.

Capital needs assessments change little from year to year, in part due to the long-term nature of the facilities themselves, and in part due to the consistency of the analytical techniques used to develop the assessments and the comparatively steady but slow changes in underlying demographics. As a result, the practice has arisen in reports in previous years to refer to earlier discussions, where the relevant information had

been carefully presented and changes had been minimal.

The needs assessment material in reports of earlier years is incorporated this year largely by reference to earlier editions and by reference to other needs assessments. The needs analyses, their major components, and their critical evaluations have been fully covered in past Supplements, such as the 1990 Supplement to Special Analysis D.

It should be noted that the needs assessment data referenced here have not been determined on the basis of cost-benefit analysis. Rather, the data reflect the level of investment necessary to meet a predefined standard (such as maintenance of existing highway conditions). The estimates do not address whether the benefits of each investment would actually be greater than its cost or whether there are more cost-effective alternatives to capital investment, such as initiatives to reduce demand or use existing assets more efficiently. Before investing in physical capital, it is necessary to compare the cost of each project with its estimated benefits, within the overall constraints on Federal spending.

Table 6-14. CURRENT SERVICES OUTLAY PROJECTIONS FOR FEDERAL PHYSICAL CAPITAL SPENDING

(In billions of constant 1987 dollars)

	1995 actual	Estimate						
		1996	1997	1998	1999	2000	2001	2002
Nondefense:								
Transportation-related categories:								
Roadways and bridges .....	15.9	16.3	15.6	15.3	15.0	14.8	14.7	14.6
Airports and airway facilities .....	4.0	3.2	3.0	3.2	3.0	3.0	3.0	3.0
Mass transportation systems .....	3.0	3.1	2.7	2.6	2.5	2.5	2.5	2.5
Railroads .....	0.4	0.4	0.5	0.5	0.4	0.4	0.4	0.4
Subtotal, transportation .....	23.3	23.1	21.8	21.7	20.9	20.7	20.6	20.5
Housing and buildings categories:								
Federally assisted housing .....	5.4	5.5	6.0	5.8	5.8	5.8	5.8	5.8
Hospitals .....	1.3	1.6	1.5	1.5	1.4	1.4	1.4	1.4
Public buildings <sup>1</sup> .....	2.7	2.7	2.7	2.5	2.6	2.6	2.6	2.6
Subtotal, housing and buildings categories .....	9.4	9.9	10.2	9.8	9.8	9.8	9.8	9.9
Other nondefense categories:								
Wastewater treatment and related facilities .....	2.4	2.4	2.4	2.3	2.2	2.2	2.3	2.2
Water resources projects .....	2.0	2.1	1.8	1.7	1.6	1.6	1.6	1.7
Space and communications facilities .....	2.7	3.1	3.1	3.0	3.0	3.1	3.1	3.1
Energy programs .....	3.0	2.2	2.1	2.1	2.1	2.1	2.1	2.1
Community development programs .....	4.2	4.8	4.5	4.3	4.2	4.2	4.2	4.2
Other nondefense .....	4.1	4.3	4.3	2.1	4.1	4.2	4.2	4.2
Subtotal, other nondefense .....	18.4	18.9	18.3	15.5	17.3	17.3	17.5	17.5
Subtotal, nondefense .....	51.1	51.9	50.3	47.0	48.0	47.9	47.9	47.9
National defense .....	52.4	45.1	41.2	39.1	39.1	38.9	38.8	36.7
Total .....	103.5	97.0	91.5	86.1	87.1	86.8	86.7	84.7

<sup>1</sup> Excludes outlays for public buildings that are included in other categories in this table.

## Significant Factors Affecting Infrastructure Needs Assessments

### Highways

1. Projected annual growth in travel to the year 2011 .....	2.15 percent
2. Annual cost to maintain overall 1993 conditions and performance on highways eligible for Federal-aid .....	\$42.8 billion (1993 dollars)
3. Annual cost to maintain overall 1994 conditions on bridges .....	\$5.1 billion (1993 dollars)

### Airports and Airway Facilities

1. Airports in the National Plan of Integrated Airport Systems with scheduled passenger traffic .....	554
2. Air traffic control towers .....	476
3. Airport development eligible under airport improvement program for period 1993–1997 .....	\$29.7 billion (\$9.4 billion for capacity) (1992 dollars)

### Mass Transportation Systems

1. Yearly cost to maintain condition and performance of rail facilities over a period of 20 years .....	\$4.2 billion (1993 dollars)
2. Yearly cost to replace and maintain the urban, rural, and special services bus fleet and facilities .....	\$3.7 billion (1993 dollars)

### Wastewater Treatment

1. Total needs of sewage treatment facilities .....	\$127.1 billion (1992 dollars)
2. Total Federal expenditures under the Clean Water Act of 1972 .....	\$66 billion
3. Percent of population served by centralized treatment facilities that benefits from at least secondary sewage treatment systems .....	94 percent
4. States and territories served by State Revolving Funds .....	51

### Housing

1. Total unsubsidized very low income renter households with worst case needs (5.3 million*)	
A. In severely substandard units .....	0.4 million
B. With a rent burden greater than 50 percent .....	5.0 million

\*The total is less than the sum because some renter families have both problems.

### Indian Health (IHS) Care Facilities

1. IHS hospital occupancy rates (1993) .....	45.8 percent
2. Average length of stay, IHS hospitals (days) (1993) .....	4.4
3. Hospital admissions (1994) .....	60,950
4. Outpatient visits (1994) .....	4,184,641
5. Population (1996) .....	1,405,971

### Department of Veterans Affairs (VA) Hospitals (1996)

1. Hospitals .....	173
2. Outpatient clinics .....	404
3. Domiciliaries .....	39
4. Centers for veterans .....	203
5. VA owned nursing home beds .....	15,712

### Water Resources

The significant factors affecting needs assessments for water resources include the need for navigation (deepwater ports and inland waterways); flood and storm damage protection; irrigation; hydropower; municipal and industrial water supply; recreation; fish and wildlife mitigation, enhancement, and restoration; and soil conservation.

Potential water resources investment needs typically consist of the set of projects that pass both a benefit-cost test for economic feasibility and a test for environmental acceptability. In the case of fish and wildlife mitigation or restoration projects, the needs consist of those projects that pass a cost-effectiveness test.

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## **Part VI: TRANSPORTATION INFRASTRUCTURE SPENDING**

Transportation infrastructure is an example of the Federal Government's investment in national capital. Transportation demand accounted for \$713 billion, or 11 percent, of America's gross domestic product in 1994. A well-functioning transportation infrastructure reduces the costs of moving people and goods, making products cheaper for Americans and more competitive overseas.

As stated in Part I, more than half of the outlays for grants to State and local governments in the 1997 President's Budget for physical investment are to assist States and localities with transportation infrastructure. The average annual investment in public-use infrastructure by the Department of Transportation (DOT) has increased by \$2.4 billion (10.6 percent) since 1993. This increase occurred across infrastructure types, i.e.,

in roads, bridges, railroads, and transit. In this Budget, DOT's investment in public use transportation infrastructure will total \$24.9 billion in budgetary resources, an increase of \$1.8 billion above 1993.

Recent Federal transportation infrastructure investment has been characterized by increased private sector involvement. Through DOT's Innovative Financing Initiative, 74 projects in 35 States with a total value exceeding \$4 billion are being pursued using new financing means that mix Federal with private funds. DOT also is establishing ten State Infrastructure Banks (SIBs) which leverage more total investment from Federal funds. The Budget proposes an additional \$250 million to help establish these Banks and initiate new ones.