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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:

- description of the size and composition of Federal investment spending;

- a discussion of capital assets used to provide Federal services and efforts to improve planning and budgeting for these assets. An Appendix to Part II presents the "Principles of Budgeting for Capital Asset Acquisitions," which are being used to guide the analysis of agency requests for spending for capital assets. These principles include a proposed new Budget Enforcement Act scorekeeping rule to enforce full funding of capital projects;
- a presentation of trends in the stock of federally financed physical capital, research and development, and education;
- alternative capital budget and capital expenditure presentations; and
- 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.

### 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 third consecutive year, the discussion of the composition of investment includes estimates of budget authority as well as outlays. For the first time, these estimates extend four years beyond the budget year to 2002.

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 in-

cluded 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 it is the recipient jurisdiction, not the Federal Government, that 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 outlays 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 \$227.9 billion in 1996. Because of reductions in defense spending they are estimated to decline to \$225.7 billion in 1997 and to \$218.7 billion in 1998. Major Federal investment will comprise an estimated 13.0 percent of total Federal outlays in 1998 and 2.7 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 \$102.8 billion in 1998. Physical investment outlays are for construction and rehabilitation, the purchase of major equipment, and the purchase or sale of land and structures. Slightly more than three-fifths of these outlays are for direct physical investment by the Federal Government, with the remaining 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 \$55.0 billion in 1996 and are estimated to decline to \$47.8 billion in 1998. Almost all of these outlays, or \$43.2 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 \$15.1 billion in 1998. These outlays include \$12.2 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 Department 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 \$6.8 billion in 1998. The largest amounts are for the air traffic control system and the Postal Service. For the purchase or sale of land and structures, collections are expected to exceed disbursements by \$3.9 billion in 1998, largely due to the planned sale of the United States Enrichment Corporation and the privatization of Elk Hills. These sales explain most of the decline in outlays from 1996 to 1998.

Grants to State and local governments for physical investment are estimated to be \$39.9 billion in 1998. More than three fifths of these outlays, or \$24.5 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 \$70.2 billion in 1998. 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 \$37.4 billion in 1998, 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 \$32.8 billion in 1998. 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 \$45.6 billion in 1998. 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 \$27.1 billion in 1998, 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 \$18.5 billion in 1998. Programs in this category are primarily aid for higher education through student financial assistance,

**Table 6-1. COMPOSITION OF FEDERAL INVESTMENT OUTLAYS**  
(In billions of dollars)

	1996 actual	Estimate	
		1997	1998
<b>Major Federal Investment Outlays</b>			
Major public physical capital investment:			
Direct Federal:			
National defense .....	55.0	50.6	47.8
Nondefense .....	20.6	21.2	15.1
Subtotal, direct major public physical capital investment ....	75.5	71.8	62.9
Grants to State and local governments .....	40.4	41.1	39.9
Subtotal, major public physical capital investment .....	115.9	113.0	102.8
Conduct of research and development:			
National defense .....	39.4	38.9	37.4
Nondefense .....	29.0	31.4	32.8
Subtotal, conduct of research and development .....	68.4	70.3	70.2
Conduct of education and training:			
Grants to State and local governments .....	24.7	26.1	27.1
Direct Federal .....	18.9	16.3	18.5
Subtotal, conduct of education and training .....	43.6	42.5	45.6
<b>Total, major Federal investment outlays .....</b>	<b>227.9</b>	<b>225.7</b>	<b>218.7</b>
MEMORANDUM			
Major Federal investment outlays:			
National defense .....	94.4	89.6	85.3
Nondefense .....	133.4	136.1	133.4
Total, major Federal investment outlays .....	227.9	225.7	218.7
Miscellaneous physical investments:			
Commodity inventories .....	-1.0	-0.7	-0.8
Other physical investment (direct) .....	4.1	3.9	3.7
Total, miscellaneous physical investment .....	3.1	3.1	2.9
<b>Total, Federal investment outlays, including miscellaneous physical investment .....</b>	<b>230.9</b>	<b>228.9</b>	<b>221.5</b>

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 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 at the bottom of Table 6-1. These items, all for physical investment, are generally unrelated to improving Government 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 \$0.8 billion in 1998.

Outlays for other miscellaneous physical investment are estimated to be \$3.7 billion in 1998. This category includes primarily conservation programs. These outlays are entirely for direct Federal spending.

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

This section provides data on budget authority as well as outlays for major Federal investment. For the first time these estimates extend four years beyond the budget year to 2002. Table 6-2 displays budget authority (BA) and outlays (O) by major programs according to defense and nondefense categories. The greatest level of detail appears in Table 6-3, which shows budget authority and outlays divided according to grants to State and local governments and direct Federal spending. Miscellaneous investment is not included in these tables because it is generally unrelated to improving Government operations or enhancing economic activity.

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

(In millions of dollars)

Description	1996 Actual	Estimate						
		1997	1998	1999	2000	2001	2002	
<b>NATIONAL DEFENSE</b>								
Major public physical investment:								
Construction and rehabilitation .....	BA	4,670	5,008	5,555	4,516	3,767	3,540	3,155
	O	5,409	4,816	4,526	4,613	3,617	3,223	2,804
Acquisition of major equipment .....	BA	42,975	44,435	42,923	50,833	57,219	60,871	68,552
	O	49,645	45,924	43,408	44,841	47,877	51,932	55,688
Purchase or sale of land and structures .....	BA	-77	-86	-87	-54	-26	-26	-26
	O	-77	-86	-87	-54	-26	-26	-26
Subtotal, major public physical investment .....	BA	47,568	49,357	48,391	55,295	60,960	64,385	71,681
	O	54,977	50,654	47,847	49,400	51,468	55,129	58,466
Conduct of research and development .....	BA	37,810	39,491	38,744	37,872	35,834	35,328	36,640
	O	39,428	38,916	37,416	37,917	36,326	35,492	35,882
Conduct of education and training (civilian) .....	BA	8	5	2	8	15	15	15
	O	9	6	3	6	12	15	15
Subtotal, national defense investment .....	BA	85,386	88,853	87,137	93,175	96,809	99,728	108,336
	O	94,414	89,576	85,266	87,323	87,806	90,636	94,363
<b>NONDEFENSE</b>								
Major public physical investment:								
Construction and rehabilitation:								
Highways .....	BA	17,884	21,973	22,304	22,168	22,072	22,043	22,034
	O	19,653	19,645	19,653	19,392	19,191	18,915	18,763
Mass transportation .....	BA	3,517	4,828	4,971	4,971	4,971	4,971	4,971
	O	3,698	3,900	3,568	3,717	3,922	4,101	4,255
Rail transportation .....	BA	119	244	434	434	434	434	434
	O	282	211	379	511	435	437	436
Air transportation .....	BA	1,606	2,284	2,395	1,049	1,050	1,051	1,052
	O	1,675	1,575	1,446	1,235	1,123	1,076	1,068
Water transportation .....	BA	129	137	120	121	122	122	122
	O	125	117	116	120	115	119	121
Community development block grants .....	BA	4,650	4,600	4,600	4,600	4,100	4,100	4,100
	O	4,545	4,837	4,641	4,845	4,633	4,438	4,216
Other community and regional development .....	BA	1,351	1,379	1,408	1,338	1,156	1,171	1,165
	O	1,530	1,805	1,495	1,325	1,339	1,259	1,219
Pollution control and abatement .....	BA	3,637	3,797	4,564	4,556	3,885	3,853	3,872
	O	3,668	3,499	3,752	4,044	4,133	4,098	3,938
Water resources .....	BA	1,878	2,068	2,312	2,012	2,045	1,927	1,943
	O	2,318	2,334	1,869	1,991	2,087	1,958	1,904
Housing assistance .....	BA	5,664	4,655	5,052	4,827	4,726	4,761	4,797
	O	6,757	7,216	6,963	6,915	6,652	6,149	5,880
Energy .....	BA	1,827	1,292	1,183	1,112	1,130	1,119	1,133
	O	1,918	1,378	1,147	1,141	1,163	1,150	1,160
Veterans hospitals and other health .....	BA	1,113	1,230	1,358	1,341	1,357	1,373	1,388
	O	1,404	1,316	1,465	1,429	1,395	1,375	1,375
Postal Service .....	BA	1,132	1,870	1,376	964	721	783	1,996
	O	1,138	1,063	1,251	1,195	986	870	2,205
GSA real property activities .....	BA							
	O	1,478	1,418	1,175	1,028	965	916	941
Other programs .....	BA	1,776	1,785	1,640	1,418	1,311	1,312	1,312
	O	2,293	2,179	1,971	2,152	1,937	1,711	1,590
Subtotal, construction and rehabilitation .....	BA	46,283	52,142	53,717	50,911	49,080	49,020	50,319
	O	52,482	52,493	50,891	51,040	50,076	48,572	49,071
Acquisition of major equipment:								
Air transportation .....	BA	1,903	1,969	1,924	2,073	2,029	2,090	2,152
	O	2,490	1,948	1,903	1,905	1,927	1,956	2,078
Postal Service .....	BA	1,890	3,545	1,075	586	180	221	665
	O	987	2,478	1,378	1,793	236	210	505
Other .....	BA	3,915	3,131	3,465	3,494	2,851	2,782	2,707
	O	3,835	3,965	3,545	4,307	4,177	3,530	3,480
Subtotal, acquisition of major equipment .....	BA	7,708	8,645	6,464	6,153	5,060	5,093	5,524
	O	7,312	8,391	6,826	8,005	6,340	5,696	6,063

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

(In millions of dollars)

Description		1996 Actual	Estimate					
			1997	1998	1999	2000	2001	2002
Purchase or sale of land and structures .....	BA	183	194	-4,040	229	241	243	-295
	O	410	441	-3,875	432	435	428	-126
Other physical assets (grants) .....	BA	926	911	1,063	1,120	1,118	1,127	1,066
	O	692	994	1,137	1,068	1,110	1,111	1,085
Subtotal, major public physical investment .....	BA	55,100	61,892	57,204	58,413	55,499	55,483	56,614
	O	60,896	62,319	54,979	60,545	57,961	55,807	56,093
Conduct of research and development:								
General science, space, and technology .....	BA	10,719	10,779	11,115	11,205	11,202	11,317	11,354
	O	9,745	10,424	10,707	10,872	10,838	10,854	10,960
Energy .....	BA	2,548	2,312	2,542	2,650	2,464	2,396	2,354
	O	2,938	2,577	2,796	2,771	2,753	2,658	2,552
Transportation .....	BA	1,794	1,960	2,005	1,910	1,893	1,919	1,938
	O	1,654	1,810	2,135	2,090	2,132	2,153	2,180
Health .....	BA	11,820	12,647	12,951	12,984	13,026	13,068	13,112
	O	10,267	12,059	12,655	12,925	12,998	13,023	13,060
Natural resources and environment .....	BA	1,781	1,841	1,901	1,865	1,891	1,906	1,939
	O	1,593	1,620	1,673	1,652	1,668	1,668	1,698
All other research and development .....	BA	2,693	2,687	2,840	3,046	3,097	3,171	3,256
	O	2,797	2,879	2,824	3,015	3,062	3,117	3,183
Subtotal, conduct of research and development .....	BA	31,355	32,226	33,354	33,660	33,573	33,777	33,953
	O	28,994	31,369	32,790	33,325	33,451	33,473	33,633
Conduct of education and training:								
Education, training, employment and social services:								
Elementary, secondary, and vocational education .....	BA	13,660	16,899	18,241	18,703	19,129	19,451	19,628
	O	14,739	16,111	16,387	18,451	18,722	19,072	19,400
Higher education .....	BA	12,713	9,452	13,212	14,578	14,700	14,998	14,418
	O	12,172	9,141	11,348	13,390	13,678	13,825	13,179
Research and general education aids .....	BA	1,762	1,993	2,000	1,834	1,940	1,977	1,994
	O	1,906	1,914	2,035	1,817	1,926	1,959	1,994
Training and employment .....	BA	5,068	5,675	5,987	6,286	6,594	5,417	5,549
	O	5,175	4,910	5,402	6,044	6,252	5,742	5,444
Social services .....	BA	6,072	6,539	6,942	7,202	7,467	7,757	8,059
	O	5,940	6,447	6,637	6,820	7,029	7,285	7,569
Subtotal, education, training, and social services .....	BA	39,275	40,558	46,382	48,603	49,830	49,600	49,648
	O	39,932	38,523	41,809	46,522	47,607	47,883	47,586
Veterans education, training, and rehabilitation .....	BA	1,274	1,526	1,503	1,598	1,603	1,653	1,671
	O	1,373	1,558	1,580	1,617	1,619	1,661	1,679
Health .....	BA	793	882	728	720	718	715	712
	O	760	864	804	728	719	708	704
Other education and training .....	BA	1,519	1,510	1,453	1,461	1,485	1,458	1,481
	O	1,485	1,505	1,434	1,466	1,476	1,460	1,470
Subtotal, conduct of education and training .....	BA	42,861	44,476	50,066	52,382	53,636	53,426	53,512
	O	43,550	42,450	45,627	50,333	51,421	51,712	51,439
Subtotal, nondefense investment .....	BA	129,316	138,594	140,624	144,455	142,708	142,686	144,079
	O	133,440	136,138	133,396	144,203	142,833	140,992	141,165
Total, major Federal investment .....	BA	214,702	227,447	227,761	237,630	239,517	242,414	252,415
	O	227,854	225,714	218,662	231,526	230,639	231,628	235,528

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

(in millions of dollars)

Description	1996 Actual	Estimate						
		1997	1998	1999	2000	2001	2002	
<b>GRANTS TO STATE AND LOCAL GOVERNMENTS</b>								
Major public physical investments:								
Construction and rehabilitation:								
Highways .....	BA	17,879	21,972	22,302	22,166	22,070	22,041	22,032
	O	19,644	19,588	19,475	19,333	19,172	18,902	18,751
Mass transportation .....	BA	3,517	4,828	4,971	4,971	4,971	4,971	4,971
	O	3,698	3,900	3,568	3,717	3,922	4,101	4,255
Rail transportation .....	BA	1	69	10	10	10	10	10
	O	16	33	48	36	10	10	10
Air transportation .....	BA	1,550	2,230	2,347	1,000	1,000	1,000	1,000
	O	1,655	1,519	1,395	1,185	1,075	1,028	1,018
Pollution control and abatement .....	BA	2,314	2,417	2,474	2,211	2,190	2,207	2,225
	O	2,368	2,127	2,119	2,032	2,155	2,279	2,188
Other natural resources and environment .....	BA	174	161	44	44	44	44	44
	O	255	283	75	48	43	43	43
Community development block grants .....	BA	4,650	4,600	4,600	4,600	4,100	4,100	4,100
	O	4,545	4,837	4,641	4,845	4,633	4,438	4,216
Other community and regional development .....	BA	1,106	1,013	1,152	1,110	926	938	929
	O	1,172	1,227	1,170	1,137	1,121	1,032	987
Housing assistance .....	BA	4,554	4,622	4,567	4,342	4,241	4,276	4,312
	O	6,007	6,335	5,999	5,845	5,508	5,022	4,767
National defense .....	BA							
	O	16	9	4	1			
Other construction .....	BA	134	130	119	115	116	116	116
	O	222	212	179	159	126	119	118
Subtotal, construction and rehabilitation .....	BA	35,879	42,042	42,586	40,569	39,668	39,703	39,739
	O	39,598	40,070	38,673	38,338	37,765	36,974	36,353
Other physical assets .....	BA	978	962	1,120	1,177	1,178	1,187	1,128
	O	757	1,075	1,208	1,130	1,169	1,170	1,145
Subtotal, major public physical capital .....	BA	36,857	43,004	43,706	41,746	40,846	40,890	40,867
	O	40,355	41,145	39,881	39,468	38,934	38,144	37,498
Conduct of research and development:								
Agriculture .....	BA	223	223	223	223	223	223	223
	O	224	234	223	221	215	193	207
Other .....	BA	89	258	126	127	127	129	130
	O	79	94	238	180	162	158	159
Subtotal, conduct of research and development .....	BA	312	481	349	350	350	352	353
	O	303	328	461	401	377	351	366
Conduct of education and training:								
Elementary, secondary, and vocational education .....	BA	12,881	16,111	17,342	17,797	18,212	18,527	18,694
	O	13,930	15,288	15,574	17,573	17,828	18,168	18,486
Higher education .....	BA	63	83	39	40	41	42	44
	O	108	77	74	38	40	41	42
Research and general education aids .....	BA	243	439	311	317	348	356	361
	O	288	286	377	334	346	349	356
Training and employment .....	BA	3,998	4,513	4,500	4,764	5,035	3,824	3,920
	O	4,162	3,783	4,208	4,666	4,751	4,184	3,839
Social services .....	BA	5,828	6,299	6,693	6,945	7,201	7,482	7,775
	O	5,702	6,185	6,391	6,573	6,774	7,022	7,297
National defense (civilian) .....	BA							
	O	2						
Agriculture .....	BA	428	426	418	418	418	418	418
	O	403	419	420	418	418	418	418
Other .....	BA	94	78	81	72	73	73	74
	O	100	82	84	81	76	72	72
Subtotal, conduct of education and training .....	BA	23,535	27,949	29,384	30,353	31,328	30,722	31,286
	O	24,695	26,120	27,128	29,683	30,233	30,254	30,510
Subtotal, grants for investment .....	BA	60,704	71,434	73,439	72,449	72,524	71,964	72,506
	O	65,353	67,593	67,470	69,552	69,544	68,749	68,374

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

(in millions of dollars)

Description	1996 Actual	Estimate					
		1997	1998	1999	2000	2001	2002
<b>DIRECT FEDERAL PROGRAMS</b>							
Major public physical investment:							
Construction and rehabilitation:							
National defense:							
Military construction .....	BA 2,815	3,220	2,519	2,537	2,565	2,491	1,633
	O 3,382	3,102	2,934	2,793	2,132	1,855	1,432
Family housing .....	BA 1,016	1,017	679	722	436	441	433
	O 1,078	1,007	916	788	372	376	372
Atomic energy defense activities and other .....	BA 839	771	2,357	1,257	766	608	1,089
	O 933	698	672	1,031	1,113	992	1,000
Subtotal, national defense .....	BA 4,670	5,008	5,555	4,516	3,767	3,540	3,155
	O 5,393	4,807	4,522	4,612	3,617	3,223	2,804
International affairs .....	BA 157	218	200	200	200	200	200
	O 279	265	230	219	213	215	215
General science, space, and technology .....	BA 423	349	338	259	252	254	260
	O 611	487	423	406	333	327	321
Water resources projects .....	BA 1,728	1,935	2,272	1,972	2,005	1,887	1,903
	O 2,090	2,082	1,799	1,946	2,047	1,918	1,864
Other natural resources and environment .....	BA 1,644	1,637	2,350	2,631	1,967	1,913	1,908
	O 1,672	1,684	1,900	2,279	2,252	2,089	2,016
Energy .....	BA 1,827	1,292	1,183	1,112	1,130	1,119	1,133
	O 1,918	1,378	1,147	1,141	1,163	1,150	1,160
Postal Service .....	BA 1,132	1,870	1,376	964	721	783	1,996
	O 1,138	1,063	1,251	1,195	986	870	2,205
Transportation .....	BA 307	366	593	595	597	598	599
	O 419	407	675	703	606	606	608
Housing assistance .....	BA 1,110	33	485	485	485	485	485
	O 750	881	964	1,070	1,144	1,127	1,113
Veterans hospitals and other health facilities .....	BA 1,066	1,183	1,317	1,304	1,320	1,336	1,351
	O 1,347	1,272	1,418	1,384	1,351	1,336	1,338
Federal Prison System .....	BA 245	310	149	97			
	O 486	309	393	527	410	253	181
GSA real property activities .....	BA 1	157					
	O 1,579	1,757	1,262	1,028	965	916	941
Other construction .....	BA 764	750	868	723	735	742	745
	O 611	847	760	805	841	791	756
Subtotal, construction and rehabilitation .....	BA 15,074	15,108	16,686	14,858	13,179	12,857	13,735
	O 18,293	17,239	16,744	17,315	15,928	14,821	15,522
Acquisition of major equipment:							
National defense:							
Department of Defense—Military (Procurement) .....	BA 42,641	44,179	42,664	50,583	56,969	60,624	68,310
	O 49,252	45,668	43,164	44,601	47,641	51,698	55,457
Atomic energy defense activities .....	BA 334	256	259	250	250	247	242
	O 393	256	244	240	236	234	231
Subtotal, national defense .....	BA 42,975	44,435	42,923	50,833	57,219	60,871	68,552
	O 49,645	45,924	43,408	44,841	47,877	51,932	55,688
General science and basic research .....	BA 252	239	244	250	251	251	251
	O 199	262	271	271	263	256	246
Space flight, research, and supporting activities .....	BA 763	744	575	574	558	540	526
	O 545	698	638	610	595	575	564
Energy .....	BA 218	183	170	194	203	202	215
	O 221	195	193	222	231	231	243
Postal Service .....	BA 1,890	3,545	1,075	586	180	221	665
	O 987	2,478	1,378	1,793	236	210	505
Air transportation .....	BA 1,903	1,969	1,924	2,073	2,029	2,090	2,152
	O 2,490	1,948	1,903	1,905	1,927	1,956	2,078
Water transportation (Coast Guard) .....	BA 228	245	242	242	242	242	242
	O 240	179	196	216	226	239	245
Other transportation (railroads) .....	BA 330	362					
	O 322	262	159	104			
Social security .....	BA 257	86	63	68	73	78	84

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

(in millions of dollars)

Description	1996 Actual	Estimate					
		1997	1998	1999	2000	2001	2002
Hospital and medical care for veterans .....	O 164	103	153	164	176	189	203
	BA 767	513	483	483	483	483	483
Department of Justice .....	O 614	564	483	489	490	490	490
	BA 377	444	480	288	296	304	314
Department of the Treasury .....	O 294	378	293	348	216	146	151
	BA 643	230	628	619	119	119	119
General supply fund .....	O 616	541	106	551	599	148	98
	BA .....	.....	.....	.....	.....	.....	.....
Other .....	O 497	556	673	703	748	655	694
	BA 28	34	523	719	566	503	411
	O 58	146	309	567	574	542	486
Subtotal, acquisition of major equipment .....	BA 50,631	53,029	49,330	56,929	62,219	65,904	74,014
	O 56,892	54,234	50,163	52,784	54,158	57,569	61,691
Purchase or sale of land and structures:							
National defense .....	BA -77	-86	-87	-54	-26	-26	-26
	O -77	-86	-87	-54	-26	-26	-26
International affairs .....	BA 10	10	10	10	10	10	10
	O 11	11	10	10	9	9	9
Sale of the United States Enrichment Corporation .....	BA .....	.....	-1,800	.....	.....	.....	.....
	O .....	.....	-1,800	.....	.....	.....	.....
Privatization of Elk Hills .....	BA .....	.....	-2,415	.....	.....	.....	.....
	O .....	.....	-2,415	.....	.....	.....	.....
Other .....	BA 173	184	165	219	231	233	-305
	O 399	430	330	422	426	419	-135
Subtotal, purchase or sale of land and structures .....	BA 106	108	-4,127	175	215	217	-321
	O 333	355	-3,962	378	409	402	-152
Subtotal, major public physical investment .....	BA 65,811	68,245	61,889	71,962	75,613	78,978	87,428
	O 75,518	71,828	62,945	70,477	70,495	72,792	77,061
Conduct of research and development:							
National defense:							
Defense military .....	BA 35,402	37,060	36,371	35,544	33,541	33,054	34,403
	O 36,936	36,485	35,067	35,626	34,077	33,264	33,682
Atomic energy and other .....	BA 2,408	2,431	2,373	2,328	2,293	2,274	2,237
	O 2,492	2,431	2,349	2,291	2,249	2,228	2,200
Subtotal, national defense .....	BA 37,810	39,491	38,744	37,872	35,834	35,328	36,640
	O 39,428	38,916	37,416	37,917	36,326	35,492	35,882
International affairs .....	BA 253	191	247	253	257	265	270
	O 419	379	339	317	320	327	332
General science, space, and technology:							
NASA .....	BA 7,844	7,797	8,009	8,034	8,025	8,133	8,164
	O 6,963	7,524	7,767	7,841	7,734	7,738	7,802
National Science Foundation .....	BA 2,204	2,277	2,367	2,373	2,379	2,386	2,392
	O 2,077	2,195	2,201	2,272	2,332	2,344	2,386
Other general science .....	BA 671	705	739	798	798	798	798
	O 705	705	739	759	772	772	772
Subtotal, general science, space, and technology .....	BA 10,972	10,970	11,362	11,458	11,459	11,582	11,624
	O 10,164	10,803	11,046	11,189	11,158	11,181	11,292
Energy .....	BA 2,548	2,312	2,542	2,650	2,464	2,396	2,354
	O 2,938	2,577	2,796	2,771	2,753	2,658	2,552
Transportation:							
Department of Transportation .....	BA 508	531	651	629	634	641	647
	O 479	489	730	702	699	699	682
NASA .....	BA 1,222	1,198	1,273	1,200	1,178	1,197	1,210
	O 1,120	1,261	1,194	1,234	1,296	1,321	1,366
Subtotal, transportation .....	BA 4,278	4,041	4,466	4,479	4,276	4,234	4,211
	O 4,537	4,327	4,720	4,707	4,748	4,678	4,600

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

(in millions of dollars)

Description	1996 Actual	Estimate						
		1997	1998	1999	2000	2001	2002	
Health:								
National Institutes of Health .....	BA	11,263	11,996	12,333	12,378	12,428	12,479	12,530
	O	9,642	11,469	12,060	12,326	12,414	12,448	12,492
All other health .....	BA	548	642	613	601	593	584	577
	O	616	581	590	594	579	570	563
Subtotal, health .....	BA	11,811	12,638	12,946	12,979	13,021	13,063	13,107
	O	10,258	12,050	12,650	12,920	12,993	13,018	13,055
Agriculture .....	BA	953	963	975	980	991	1,002	1,013
	O	944	948	962	974	982	1,027	1,026
Natural resources and environment .....	BA	1,778	1,838	1,898	1,862	1,888	1,903	1,936
	O	1,587	1,619	1,671	1,650	1,666	1,666	1,696
National Institute of Standards and Technology .....	BA	416	429	480	506	518	564	620
	O	374	428	440	463	491	514	543
Hospital and medical care for veterans .....	BA	256	263	235	235	235	235	235
	O	231	261	241	234	233	233	233
All other research and development .....	BA	579	603	643	811	835	842	854
	O	596	605	599	787	803	805	822
Subtotal, conduct of research and development .....	BA	68,853	71,236	71,749	71,182	69,057	68,753	70,240
	O	68,119	69,957	69,745	70,841	69,400	68,614	69,149
Conduct of education and training:								
Elementary, secondary, and vocational education .....	BA	779	788	899	906	917	924	934
	O	809	823	813	878	894	904	914
Higher education .....	BA	12,650	9,369	13,173	14,538	14,659	14,956	14,374
	O	12,064	9,064	11,274	13,352	13,638	13,784	13,137
Research and general education aids .....	BA	1,519	1,554	1,689	1,517	1,592	1,621	1,633
	O	1,618	1,628	1,658	1,483	1,580	1,610	1,638
Training and employment .....	BA	1,070	1,162	1,487	1,522	1,559	1,593	1,629
	O	1,013	1,127	1,194	1,378	1,501	1,558	1,605
Health .....	BA	793	882	728	720	718	715	712
	O	760	864	804	728	719	708	704
Veterans education, training, and rehabilitation .....	BA	1,274	1,526	1,503	1,598	1,603	1,653	1,671
	O	1,373	1,558	1,580	1,617	1,619	1,661	1,679
General science and basic research .....	BA	502	523	519	518	518	518	518
	O	469	502	484	518	516	530	518
National defense .....	BA	8	5	2	8	15	15	15
	O	7	6	3	6	12	15	15
International affairs .....	BA	236	218	199	199	199	199	199
	O	279	233	210	201	199	199	199
Other .....	BA	503	505	485	511	543	525	556
	O	472	531	482	495	522	504	535
Subtotal, conduct of education and training .....	BA	19,334	16,532	20,684	22,037	22,323	22,719	22,241
	O	18,864	16,336	18,502	20,656	21,200	21,473	20,944
Subtotal, direct Federal investment .....	BA	153,998	156,013	154,322	165,181	166,993	170,450	179,909
	O	162,501	158,121	151,192	161,974	161,095	162,879	167,154
Total, major Federal investment .....	BA	214,702	227,447	227,761	237,630	239,517	242,414	252,415
	O	227,854	225,714	218,662	231,526	230,639	231,628	235,528

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

The previous section discussed Federal investment broadly defined. The focus of this section is much narrower—the review of planning and budgeting for capital assets during the past year and the resultant budget proposals for capital assets owned by the Federal Government and used to deliver Federal services. Capital assets consist of Federal buildings, information technology, and other facilities and major equipment, including weapons systems, federally owned infrastructure, and space satellites.<sup>1</sup> With proposed major agency restructuring, organizational streamlining, and other reforms, good planning may suggest reduced spending for some assets, such as office buildings, and increased spending for others, such as information technology, to increase the productivity of a smaller workforce.

In recent years the Office of Management and Budget (OMB) and the Congress have reviewed the Federal Government's performance in planning, budgeting, risk management, and the acquisition of capital assets. The reviews indicate that the performance is uneven across the Government. The problems have many causes and as a result, there is no single solution. Agencies that are strong in this area may be able to provide best practices that could assist agencies that need improvement. In meeting the objective of improving the Government's performance, it is essential that the caliber of government planning and budgeting for capital assets be improved.

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

**Risk Management.**—Recent OMB reviews have found a recurring theme in many capital asset acquisitions—that risk management should become more central to the planning, budgeting, and acquisition process. Failure to analyze and manage the inherent risk in all capital asset acquisitions may have contributed to cost overruns, schedule shortfalls, and acquisitions that fail to perform as expected. Failure to adopt capital asset requirements that are within the capabilities of the market and budget limitations may also have contributed to these problems. For each major project a risk analysis that includes how risks will be isolated, minimized, monitored, and controlled may help prevent these problems. The proposals in this budget, together with recent legislation enacted by Congress, are designed to help the Government manage better its portfolio of capital assets.

**Long-Term Planning and Analysis.**—Planning and managing capital assets, especially better management of risk, has historically been a low priority for some agencies. Attention focuses on coming-year appropria-

<sup>1</sup>This is almost the same as the definition in Part I of this chapter for spending for direct Federal construction and rehabilitation, major equipment, and purchase of land, except that capital assets excludes grants to private groups for these purposes (e.g., grants for equipment for research and grants to AMTRAK). A more complete definition can be found in the glossary to the "Principles of Budgeting for Capital Asset Acquisitions," which is at the end of this Part.

tions, and justifications are often limited to 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.

A need for better risk management, integrated life-cycle planning, and operation of capital assets at many agencies was evident in the OMB reviews. 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.

**Congressional concern.**—Congress has expressed its concern about planning for capital assets with legislation and other actions that complement Administration efforts to ensure better performance:

- The Government Performance and Results Act of 1993 (GPRA) is designed to help ensure that program objectives are more clearly defined and resources are focused on meeting these objectives.
- The Federal Acquisition Streamlining Act of 1994 (FASA), Title V, requires agencies to improve the management of large acquisitions. Title V requires agencies to institute a performance-based planning, budgeting, and management approach to the acquisition of capital assets. As a result of improved planning efforts, agencies are required to establish cost, schedule, and performance goals that have a high probability of successful achievement. For projects that are not achieving 90 percent of original goals, agencies are required to discuss corrective actions taken or planned to bring the project within goals. If they cannot be brought within goals, agencies should identify how and why the goals should be revised, whether the project is still cost beneficial and justified for continued funding, or whether the project should be canceled.
- The Information Technology Management Reform Act of 1996 (ITMRA) is designed to ensure that information technology acquisitions support agency missions developed pursuant to GPRA. ITMRA also requires a performance-based planning, budgeting, and management approach to the acquisition of capital assets.
- The General Accounting Office recently released a study, *Budget Issues: Budgeting for Federal Capital* (November 1996), written in response to a congressional request, which recommended that OMB continue its focus on fixed assets.

**OMB concern.**—Since 1994, OMB has devoted particular attention to improving the process of planning, budgeting, and acquiring capital assets.

- Separate OMB reviews that focused on capital assets have occurred for the last three budgets.
- After seeking out and analyzing the problems, which differed from agency to agency, OMB issued guidance on this issue in 1994. This guidance was repeated in 1995 and reissued in 1996 as OMB Circular A-11: Part 3: "Planning, Budgeting, and Acquisition of Fixed Assets" (July 1996) (hereafter referred to as Part 3). Part 3 identified other OMB guidance on this issue.<sup>2</sup>

Agencies were requested to approach planning for capital 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 Administration proposes to make agencies responsible for the capital assets they use, and to work throughout the coming year to improve agency risk management, planning, budgeting, acquisition, and operation of these assets.

- In the *FY 1997 Budget* a year ago, the Administration proposed a separate allowance of \$1.4 billion for full funding of selected capital assets in the Department of Energy, NASA, and the Department of the Interior. Congress responded favorably by enacting a portion of this allowance for the Department of Energy.
- OMB memorandum 97-02, *Funding Information Systems Investments* (October 25, 1996) was issued to establish clear and concise decision criteria regarding investments in major information technology investments.
- As part of this Budget, OMB is:
  - requesting full funding in regular or advance appropriations for new capital projects and for many capital projects formerly funded incrementally. These requests are shown in Table 6-5 and discussed in the accompanying text.
  - issuing the "Principles of Budgeting for Capital Asset Acquisitions," which appear at the end of this Part and are also available as a separate publication. These principles offer guidelines to agencies to help carry out better planning, analysis, risk management, and budgeting for capital asset acquisitions. The principles include a proposed new Budget Enforcement Act score-

keeping rule to enforce full funding of capital projects.

- Later this year OMB plans to publish a "Capital Programming Guide." This Guide is being developed by an interagency task force that includes participation from the General Accounting Office. A draft of the Guide is currently in circulation for comment. Its purpose is to provide professionals in the Federal Government a basic reference on capital assets management principles to assist them in planning, budgeting, acquiring, and managing the asset once in use. The draft Guide emphasizes risk management and the importance of analyzing capital assets as a portfolio.

**From Planning to Budgeting.**—Long-range agency plans should channel fully justified budget-year and out-year capital acquisition proposals into the budget process. Agencies were asked to submit projections of both budget authority and outlays for high-priority capital asset proposals not only for the budget year but for the four subsequent years through 2002 as well. In addition, OMB held a separate review on capital assets again as part of the 1998 budget review process. This provided an overview of requests, flagged issues, and considered cross-cutting recommendations. Agency-specific capital asset issues were highlighted in the agency reviews.

Attention was given to whether the "lumpiness" of some capital assets—large one-year temporary increases in funding—disadvantaged them in the budget review process. In some cases, agencies aggregate capital asset acquisitions into budget accounts containing only such acquisitions; such accounts tend to smooth out year-to-year changes in budget authority and outlays and avoid crowding other expenditures. In other cases, agencies or program managers do not hesitate to request "spikes" 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. Part 3 encouraged agencies to accommodate justified spikes in their own internal reviews, and the OMB review in some cases made special allowance for these one-time increases.

**Full Funding of Capital 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. Full funding was endorsed by the General Accounting Office in its recent report, *Budgeting for Federal Capital* (November 1996). This rule is followed for most Department of Defense procurement and construction programs and for General Services Administration buildings. In other areas too often it is not. When it is not followed and capital assets are funded in increments, without certainty if or when future funding will be available, it can and occasionally does result in poor risk management, weak planning, acquisition of assets

<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 A-130, *Management of Federal Information Resources* (February 20, 1996), which provides principles for internal management and planning practices for information systems and technology (published in the *Federal Register*, February 20, 1996, pp. 6433-6434).

not fully justified, higher acquisition costs, cancellation of major projects, the loss of sunk costs, and inadequate funding to maintain and operate the assets. Full funding is also an important element in managing large acquisitions effectively and holding management responsible for achieving goals.

This budget requests full funding with regular or advance appropriations for new capital projects and for many capital projects funded incrementally in the past. Projects that might have been funded in increments in past years and are fully funded in this budget are identified below in Table 6-5 and discussed in the accompanying text. Next year additional effort will be made to include full funding for all new capital projects, or at least economically and programmatically viable segments (or modules) of new projects.

**Other Budgeting Issues.**—Other budgeting decisions can also aid in acquiring capital assets. Availability of funds for one year often may not be enough time to complete the acquisition process. Most agencies request that funds be available for more than one year to complete acquisitions efficiently, and Part 3 encouraged this. As noted, many agencies aggregate asset acquisition in budget accounts to avoid lumpiness. In some cases, these are revolving funds that “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 align them better with program outputs and outcomes and to charge the appropriate 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 capital asset acquisition and management.

**Acquisition of Capital Assets.**—Improved planning, budgeting, and acquisition strategies are necessary to increase the ability of agencies to acquire capital assets within, or close to, the original estimates of cost, schedule, and performance used to justify project budgets and to maintain budget discipline. The OMB initiative along with enactment of FASA (Title V) and ITMRA require agencies to institute a performance-based planning, budgeting, and management approach to the acquisition of capital assets.

OMB, working with the agencies over the last year, began separate but related efforts to develop an integrated management approach that employs performance based acquisition management as part of a disciplined capital programming process. OMB also wants the capital asset acquisition goals incorporated into the annual performance plan called for by GPRA so that a unified picture of agency management activities is presented and acquisition performance goals are linked to the achievement of program and policy goals. This integrated approach will not only eliminate duplication in reporting agency actions but, most importantly, will

foster more effective implementation of performance-base acquisition management.

The first effort was the issuance of OMB Circular A-11, Part 3, *Planning, Budgeting and Acquisition of Fixed Assets*, in July 1996. Part 3 presents unified guidance to agencies on planning, budgeting, and acquisition management of fixed assets. It also presents unified guidance designed to coordinate the collection of agency information for OMB reports to the Congress required by FASA Title V and ITMRA. Part 3 for this budget limited reporting to high-priority acquisitions with expansion to all acquisitions planned for the 1999 Budget. Part 3 required agencies to provide information to OMB on the extent of planning and risk mitigation efforts accomplished for new projects to ensure a high probability that the cost, schedule and performance goals established will be successfully achieved. For ongoing projects agencies are to provide information on the achievement of, or deviation from, goals. For projects that are not achieving 90 percent of original goals, agencies are required to discuss corrective actions taken, or contemplated, to bring the project within goals or, if not, how and why the goals should be revised and whether the project is still cost beneficial and justified for continued funding or should be canceled. Acquisition goals submitted with the 1998 Budget, if approved by OMB, are the baseline goals for all future monitoring of project progress for both management purposes and reporting to Congress as required by FASA Title V and ITMRA.

As the second effort, on October 25, 1996, OMB memorandum 97-02, *Funding Information Systems Investments*, was issued to establish clear and concise decision criteria regarding investments in major information technology investments. As a general presumption, OMB will recommend new or continued funding only for those major system investments that satisfy these criteria and expands coverage to all capital investments.

At the Appendix to this Part are the *Principles of Budgeting for Capital Asset Acquisitions*, which incorporate the above criteria and expand coverage to all capital investments. OMB recognizes that many agencies are in the middle of ongoing projects initiated prior to enactment of ITMRA and FASA Title V, and may not be able to satisfy the criteria immediately. For those systems that do not satisfy the criteria, OMB considered requests to use 1997 and 1998 funds to support reevaluation and replanning of the project as necessary to achieve compliance with the criteria or to determine that the project would not meet the criteria and should be canceled.

As a result of these two initiatives, capital asset acquisitions are to have baseline cost, schedule, and performance goals for future tracking purposes or they are to be either reevaluated and changed or canceled if no longer cost beneficial.

**Outlook.**—The effort to improve planning and budgeting for capital assets will continue in 1997.

- The Administration will work with the Congress to increase the number of projects that are fully funded with regular or advance appropriations.
- OMB will be working with congressional committees, the President's Management Council, the Chief Financial Officers Council, and the Chief Information Officers Council to help agencies with their responsibility for capital assets through the alignment of budgetary resources with program results. OMB will also work with these groups to implement the "Principles of Budgeting for Capital Asset Acquisitions," which are shown as an Appendix to this Part.
- In the OMB review process, proposals for the acquisition of capital 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 propose full funding for acquisitions in their budget requests.
- 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.
- As noted earlier, OMB plans to issue a "Capital Programming Guide" that will assist professionals in the Federal Government in risk management, planning, budgeting, acquiring, and operating efficiently capital asset acquisitions.

### Major Acquisition Proposals

For the definition of major capital assets described above this budget requests \$61.8 billion of budget authority for 1998. This includes \$45.8 billion for the Department of Defense and \$16.0 billion for other agencies. The major requests are shown in the accompanying Table 6-4: "Capital Asset Acquisitions," which distributes the funds generally according to the categories for buildings, information technology, and other acquisitions.

### Buildings

This category includes both general purpose office buildings and special purpose buildings, such as hospitals, prisons, and courthouses. This budget includes \$10.9 billion of budget authority for 1998 for the major building acquisitions.

*Department of Defense.*—The budget includes \$3.7 billion for 1998 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 1998 budget requests \$1.7 billion in obligations for GSA for the construction or renovation of buildings. These funds will allow for new construction for U.S. Courts and the acquisition of general purpose office space in locations where long-term needs show that ownership is preferable to leasing.

*Department of Energy.*—This budget requests \$1.5 billion for 1998 for assets in this category. The largest item is a request for \$0.9 billion for the National Ignition Facility, which will be used to perform experiments, including inertial confinement fusion experiments, at high pressures and temperatures. These investments are also discussed in the text that accompanies Table 6-5.

*Department of Veterans Affairs.*—The 1998 budget requests \$0.5 billion in budget authority for new construction and rehabilitation of veterans hospitals, clinics, nursing homes, and other health care facilities; for construction of a new national cemetery and expansion of two existing national cemeteries; and for improvements to regional benefits offices.

*Department of Health and Human Services.*—This budget requests \$0.5 billion for the Department of Health and Human Services for buildings. This includes capital projects for the National Institutes of Health Clinical Research Center and improved facilities for the Indian Health Service. Both are discussed with Table 6-5 and the request for advance appropriations.

*Other agencies.*—The largest item in this category is for the Postal Service (\$1.4 billion in 1998). Other building acquisitions include the Research Triangle Park consolidated facility in North Carolina for the Environmental Protection Agency; the Department of State for buildings abroad; the Department of Justice for new prison construction and related capital projects, and a National Laboratory Center and fire research facility for the Bureau of Alcohol, Tobacco, and Firearms. Funds are also requested in the Commerce Department for new construction of a fisheries laboratory in Santa Cruz, California, to support NOAA's environmental stewardship mission and a new facility at the Goddard Space Flight Center in Maryland.

### Information Technology

This category covers capital purchases for information technology and includes computer hardware, major software, and renovations required for this equipment. This budget includes \$3.3 billion in budget authority for 1998 for major information technology.

**Table 6-4. CAPITAL ASSET ACQUISITIONS**

(Budget authority in billions of dollars)

	1996 actual	1997 proposed	1998 proposed
<b>MAJOR ACQUISITIONS</b>			
Buildings:			
Department of Defense .....	4.6	4.9	3.7
General Services Administration <sup>1</sup> .....	1.3	1.5	1.7
Department of Energy .....	0.2	0.2	1.5
Department of Veterans Affairs .....	0.5	0.6	0.5
Department of Health and Human Services .....	0.4	0.5	0.5
Other agencies .....	2.3	3.0	3.0
Subtotal, buildings .....	9.3	10.7	10.9
Information technology:			
Department of Defense .....	1.3	1.5	1.4
Internal Revenue Service .....	0.6	0.2	0.6
Other agencies .....	1.1	0.9	1.3
Subtotal, information technology .....	3.0	2.6	3.3
Other acquisitions:			
Department of Defense .....	40.5	42.0	40.7
Department of Transportation .....	2.2	2.3	2.2
Department of Energy .....	1.9	1.8	2.0
Army Corps of Engineers .....	1.2	1.5	1.8
Other agencies .....	5.9	6.8	4.5
Subtotal, other acquisitions .....	51.7	54.4	51.2
Total, major acquisitions <sup>2</sup> .....	64.1	67.7	65.5
Sale of major assets .....	.....	.....	-4.2
Acquisitions in smaller accounts .....	0.7	0.7	0.5
Total, capital asset acquisitions <sup>3</sup> .....	64.7	68.4	61.8

\* indicates \$50 million or less.

<sup>1</sup> Obligations.<sup>2</sup> Includes accounts with acquisitions of \$50 million or more in one year.<sup>3</sup> This total is derived from the direct Federal major public physical investment budget authority on Table 6-3 (\$61.9 billion for 1998). Table 6-4 excludes an estimate of spending for assets not owned by the Federal Government (\$2.5 billion for 1998), and includes obligations for the General Services Administration (\$2.5 billion in 1998).

**Department of Defense.**—The budget requests \$1.4 billion for 1998 for the Department of Defense for information technology capital purchases. These funds will be used to purchase hardware and software to support worldwide communications to bases and deployed forces, improve information security for critical computer systems, replace obsolete equipment, and improve the information processing capabilities for the department. Virtually every function within the Department, including logistics, communications, command and control, intelligence, acquisition management, finance, personnel, health, and environmental security will be supported by these information technology investments.

**Internal Revenue Service (IRS) Information Technology Investments.**—The budget requests \$0.6 billion in budget authority for 1998 for information technology investments in 1999. These efforts and proposed advance appropriations for 1999 will ensure that future capital investments by the IRS will improve customer service by providing alternative means of filing returns and paying taxes, improve telephone service for taxpayers; and give employees immediate access to complete information and modern tools to do their jobs. These investments are also discussed in the text that accompanies Table 6-5, which displays advance appropriations for capital acquisitions.

**Other agencies.**—Other major information technology purchases include funds to support science and space activities for NASA; to support law enforcement activities in the Department of Justice; to support the delivery of veterans health care services and improve the processing of veterans benefits claims, and for the General Services Administration. Also included are funds to support modernization of the National Weather Service in the Department of Commerce. This is discussed in the text accompanying Table 6-5.

### Other Acquisitions

This category includes facilities and major equipment not included above. The budget requests \$51.2 billion for 1998 for the acquisitions included in this capital assets category. Most of this is for defense procurement of weapons.

**Department of Defense.**—The budget requests \$40.7 billion for 1998 to procure or modify weapons systems and related support equipment. This includes tactical fighter aircraft, airlift aircraft, naval vessels, tanks, helicopters, missiles, and vehicles.

**Department of Transportation.**—The budget requests \$2.2 billion for the Department of Transportation, which includes funds to modernize the air traffic control system and funds for the Coast Guard to acquire vessels and modernize shore facilities. Requests for advance appropriations for the air traffic control system in the Federal Aviation Administration are discussed with Table 6-5.

**Department of Energy.**—This budget includes \$2.0 billion for major facilities and equipment. These are largely for general science and research activities, environmental restoration, weapons activities, nuclear and non-nuclear energy activities, and the Bonneville Power Administration. This budget requests full upfront funding for many of these projects. These data are shown in Table 6-5 and described in the accompanying text.

**Army Corps of Engineers.**—The budget requests \$1.8 billion for 1998 for capital assets for the Army 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. Table 6-5 identifies the amounts of upfront funding and advance appropriations requested for these programs and the accompanying text discusses these activities.

**Other agencies.**—The largest item in this category is equipment for the Postal Service (\$1.1 billion in 1998). Other major acquisitions in this category are for the Tennessee Valley Authority for dams, locks, and other facilities; the purchase of vehicles by the General Services Administration, and medical equipment to support the delivery of veterans health care.

### Full Funding of Major Projects

This budget proposes full funding for new capital projects and for many projects formerly funded incrementally.

The importance of full funding was discussed earlier in this Part and is also explained in the "Principles of Budgeting for Capital Asset Acquisitions," which appears as an Appendix to this Part. This budget proposes to use this principle more consistently than in past years. Table 6-5 shows spending for capital projects proposed for full funding in this budget that might have been funded in increments in the past. This budget requests \$7.7 billion in budget authority for 1998 and \$14.4 billion in advance appropriations for 1999-2003, for a total request of \$22.1 billion for these projects for these years.

### ***Army Corps of Engineers***

This budget requests \$380 million in 1998 to fully fund upfront new projects and \$228 million for 1998 and \$575 million for 1999-2002 to fully fund ongoing projects that can be completed in 2002 or earlier. These funds finance construction, rehabilitation, and related activity for water resources development projects that provide navigation, flood control, water supply, hydroelectric, and other benefits.

### ***Department of Commerce***

This budget requests \$503 million for 1998 and \$2,332 million in advance appropriations for 1999-2003 for capital asset acquisitions in the National Oceanic and Atmospheric Administration (NOAA). These acquisitions support the largest modernization in the history of the National Weather Service. The modernization is well underway and demonstrating improvements in weather forecasts and warnings that lead to lives and property saved. The budget supports this multi-year effort to develop and deploy advanced technology, including advanced radar equipment, other ground observing systems, and geostationary and polar-orbiting satellites that will greatly improve the timeliness and accuracy of severe weather and flood warnings while reducing staffing requirements. The total request of \$3,989 million in budget authority for 1998-2010 will complete the systems acquisition related to the modernization of the National Weather Service, procure the current and follow-on geostationary satellite series, the current polar orbiting satellite system, and several construction projects including construction of a new fisheries laboratory and science center.

### ***Department of Energy***

This budget proposes full upfront funding of \$2.3 billion in budget authority for 1998 for major asset acquisitions for defense, science, and energy activities in the Department of Energy.

*Defense.*—This budget requests \$2.2 billion to complete useful segments of all new and ongoing construction projects supporting national security programs in the Department of Energy.

*Weapons activities.*—Funds are requested for twenty two projects that support the nuclear weapons activities mission. The largest project is the National Ignition Facility (NIF), which will be used

to perform experiments, including inertial confinement fusion experiments, at high pressures and temperatures. The budget requests \$876 million to complete NIF, which will be located at the Lawrence Livermore National Laboratory. Other major projects include the Dual Axis Radiographic Hydrodynamic Facility at the Los Alamos National Laboratory, the Contained Firing Facility Addition at the Lawrence Livermore National Laboratory, the Chemical and Materials Laboratory Upgrade at Los Alamos National Laboratory and infrastructure improvement projects at several facilities.

*Environmental management.*—Funds are requested for twenty-five projects that support the defense environmental management mission. Waste management projects include improvements to hazardous/radioactive tank farm systems at the Savannah River and Hanford sites, landfill construction at Oak Ridge, construction of the initial tank retrieval system for high level waste at the Hanford site, a new hazardous waste treatment and processing facility at the Pantex Plant and a decontamination and waste treatment facility at Lawrence Livermore National Laboratory. In the nuclear material and facility stabilization program, projects include spent nuclear fuel dry storage at Idaho National Engineering Laboratory, a plutonium stabilization system for the Hanford Site, an actinide packaging and storage facility at Savannah River, a spent nuclear fuel canister storage and stabilization facility at Hanford, and utility system upgrades at Idaho.

*Naval reactors development.*—Funds are requested for four small projects to upgrade infrastructure at the Department of Energy's Bettis and Knolls laboratories in support of naval reactors development.

*Science Assets Acquisition (High-Energy and Nuclear Physics).*—This budget requests \$127 million for five projects that support the general science mission. Completion of two new accelerator facilities, the Relativistic Heavy Ion Collider at Brookhaven National Laboratory and the Main Injector at Fermi National Laboratory (Fermilab), will provide significant new capabilities for exploring the physics of nuclear and sub-nuclear matter. Two small projects provide for engineering and prototyping neutrino and colliding beam experiments at Fermilab. The final project will replace 30-year old switching gear at the Stanford Linear Accelerator Center's master substation.

*Energy Assets Acquisition.*—This budget requests \$42 million in 1998 for seventeen research and infrastructure projects that support the energy mission. Eleven projects rectify environment, safety, and health hazards or renovate or replace inefficient general purpose facilities at Oak Ridge, Argonne, Lawrence, Berkeley, and Brookhaven National Laboratories. Three projects add energy research capabilities at the Combustion Research Facility (Sandia National Laboratories, Livermore), National Renewable Energy Laboratory, and Los

Table 6-5. PROPOSED SPENDING TO FULLY FUND SELECTED CAPITAL ASSET ACQUISITIONS

(Budget authority in millions of dollars)

	Regular appropriations 1998	Advance appropriations					Sum 1999- 2003
		1999	2000	2001	2002	2003	
<b>ARMY CORPS OF ENGINEERS</b>							
<b>Construction:</b>							
Projects with full upfront funding <sup>1</sup> .....	380						
Projects with advance appropriations <sup>2</sup> .....	228	277	177	89	32		575
Subtotal, Army Corps of Engineers .....	608	277	177	89	32		575
<b>DEPARTMENT OF COMMERCE</b>							
<b>National Oceanic and Atmospheric Administration: Capital Assets Acquisition: <sup>3</sup></b>							
Projects with advance appropriations <sup>2</sup> .....	503	724	551	480	375	202	2,332
<b>DEPARTMENT OF ENERGY</b>							
<b>National Defense Assets Acquisition:</b> Projects with full upfront funding <sup>1</sup> .....	2,166						
<b>Science Assets Acquisition:</b> Projects with full upfront funding <sup>1</sup> .....	127						
<b>Energy Assets Acquisition:</b> Projects with full upfront funding <sup>1</sup> .....	42						
Subtotal, Department of Energy .....	2,335						
<b>DEPARTMENT OF HEALTH AND HUMAN SERVICES</b>							
<b>National Institutes of Health:</b> Projects with advance appropriations <sup>2</sup> .....	90	90	40				130
<b>Indian Health Service:</b> Projects with advance appropriations <sup>2</sup> .....	39	39	31				70
Subtotal, Department of Health and Human Services .....	129	129	71				200
<b>DEPARTMENT OF THE INTERIOR</b>							
<b>Bureau of Reclamation: Water and Related Resources:</b>							
Projects with full upfront funding <sup>1</sup> .....	17						
Projects with advance appropriations <sup>2</sup> .....	6	11	9		1		21
Subtotal, Bureau of Reclamation .....	23	11	9		1		21
<b>National Park Service: Projects with advance appropriations: <sup>2</sup></b>							
Construction .....	52	48	35	20	31	26	160
Everglades Restoration Fund .....	100	100	100	100			300
Subtotal, National Park Service .....	152	148	135	120	31	26	460
Subtotal, Department of the Interior .....	175	159	144	120	32	26	481
<b>DEPARTMENT OF JUSTICE</b>							
<b>Federal Bureau of Investigation: Salaries and expenses:</b> Projects with advance appropriations <sup>2</sup> .....	84	48					48
<b>DEPARTMENT OF TRANSPORTATION</b>							
<b>Federal Aviation Administration: Facilities and Equipment: <sup>3</sup></b>							
Projects with advance appropriations <sup>2</sup> .....	679	675	724	424	206	118	2,147
<b>DEPARTMENT OF THE TREASURY</b>							
<b>Internal Revenue Service: Information Technology Investments:</b> Projects with advance appropriations <sup>2</sup> .....	500	500					500
<b>NATIONAL AERONAUTICS AND SPACE ADMINISTRATION</b>							
<b>Human Space Flight:</b> Projects with advance appropriations: <sup>2</sup> International Space Station .....	2,121	2,109	1,915	1,597	1,147		6,768
<b>Science, Aeronautics, and Technology: Projects with advance appropriations: <sup>2</sup></b>							
Space Infrared Telescope Facility (SIRTF) .....	81	135	130	117	26		408
Stratospheric Observatory for Infrared Astronomy (SOFIA) .....	46	57	49	32			138
X-33 Experimental Launch Vehicle .....	330	314	75				389
Subtotal, science, aeronautics, and technology .....	457	505	254	150	26		934
<b>Mission Support:</b> Projects with advance appropriations: <sup>2</sup> Tracking and Data Relay Satellite (TDRS)—H, I, J .....	158	120	58	70	98	53	399
Subtotal, NASA .....	2,736	2,735	2,226	1,817	1,271	53	8,101
<b>Total</b> .....	<b>7,749</b>	<b>5,247</b>	<b>3,893</b>	<b>2,930</b>	<b>1,916</b>	<b>399</b>	<b>14,384</b>

<sup>1</sup> Budget authority to complete the project is requested in the budget year.<sup>2</sup> Budget authority to complete the project is requested partly in the budget year and partly in future years in advance appropriations.<sup>3</sup> This budget requests advance appropriations for years beyond 2003 for these programs.

Alamos National Laboratory. In addition, three waste-related projects are included: a low-level waste handling project at Oak Ridge National Laboratory, a spent nuclear fuels project at Idaho National Engineering Laboratory, and a facility for depleted uranium storage at K-25 in Oak Ridge.

### ***Department of Health and Human Services***

This budget requests advance appropriations for three construction projects in the Department of Health and Human Services. The first project, the Clinical Research Center of the National Institutes of Health (NIH), is an advanced clinical research facility that will house laboratories and hospital beds under one roof. This will allow the continuation of the best possible clinical research at NIH. Congress enacted an initial \$90 million for the Clinical Research Center in 1997, and this budget requests budget authority of \$90 million for 1998 and advance appropriations for the remaining \$130 million for 1999 and 2000.

This budget also requests \$39 million in appropriations for 1998 and \$70 million in advance appropriations over the two years 1999–2000 for construction of two Indian Health Service facilities, both of which will replace antiquated hospitals currently in use. The funds will finance a proposed new hospital to serve the Fort Defiance area of the Navajo reservation in Arizona and a new ambulatory care center to serve the Hopi reservation, also in Arizona.

### ***Department of the Interior***

This budget requests \$175 million in 1998 budget authority and \$481 million in advance appropriations for 1999–2003 to fully fund projects in the Bureau of Reclamation and the National Park Service.

*Bureau of Reclamation.*—This budget requests \$23 million in regular appropriations for 1998 for the Bureau of Reclamation and \$21 million over the years 1999–2001 in advance appropriations to fully fund five water resources projects. These funds will finance the modification of an existing dam to meet current safety criteria, river front and levee work to reduce flood damages, and drainwater reuse facilities to improve aquifer water quality.

*National Park Service.*—The National Park Service needs to build or restore its buildings and other structures over the next few years. Funding stability is particularly needed for the National Park Service (NPS) to restore the Elwha River in Olympic National Park, Washington, by acquiring and removing two dams. Before NPS can acquire the dams, the Secretary of the Interior must determine that funds to complete restoration are available. In addition to \$8 million already appropriated and \$25 million requested in regular appropriations for 1998, advance appropriations of \$78 million after 1998 would fully fund the \$111 million project and provide the funding stability needed for the Secretary to determine that funds are available. Advance appropriations are also requested for seven other parks that have an ongoing project requiring out-

year funding: Sequoia National Park (\$16 million); Independence National Historical Park (\$11 million); Lincoln and Jefferson Memorials (\$9 million); Washington Monument (\$2 million); Riis Park in Gateway National Recreation Area (\$5.5 million); Minuteman National Historical Park (\$1.2 million); and Everglades National Park (\$31.5 million starting in 2002). For 1998 the budget requests \$27 million in regular appropriations for these projects.

This budget proposes a specific fund to provide a steady source of funding for land acquisition and related activities furthering Everglades restoration, including a critical water management project to modify the flow of water into Everglades National Park. This budget requests regular appropriations of \$100 million for 1998 and advance appropriations of \$100 million annually through 2001, of which \$59.2 million would be used for the Everglades Modified Water Delivery project. An additional \$16 million in 2002 and \$15.5 million in 2003 in advance appropriations are included in the National Park Service construction account to complete funding for the \$91 million project.

### ***Department of Justice***

This budget requests \$84 million in budget authority for 1998 and \$48 million in advance appropriations for 1999 to complete automation of the FBI fingerprint system.

### ***Department of Transportation***

*Federal Aviation Administration.*—This Budget requests \$679 million in 1998 and an additional \$2.1 billion for 1999–2003, with additional requests through 2005, for 13 multi-year capital projects to improve and modernize the FAA's air traffic control, communications, and aviation weather information systems. These projects are: Aviation Weather Services Improvements, Terminal Digital Radar, Terminal Automation (STARS), Wide Area Augmentation System for GPS, Display System Replacement, Weather and Radar Processor, Voice Switching and Control System, Tower Automation Program, Oceanic Automation System, Aeronautical Data Link, Operational and Supportability Implementation System (OASIS), Northern California TRACON, and Alaskan NAS Interfacility Communications System.

### ***Department of the Treasury***

*Internal Revenue Service.*—This budget requests \$500 million in budget authority for 1998 and \$500 million in advance appropriations for 1999 to finance information technology investments beginning in 1999. During 1997 and 1998, the IRS and the Treasury Department are significantly modifying the business plans for modernizing the IRS tax administration and systems by focusing on reengineering work processes and exploring private sector technology opportunities. These efforts will ensure that future capital investments by the IRS will improve customer service by providing alternative means of filing returns and paying taxes, improve telephone service for taxpayers; and give employees imme-

diate access to complete information and modern tools to do their jobs.

### ***National Aeronautics and Space Administration (NASA)***

This budget requests \$2.7 billion in budget authority for 1998 and \$8.1 billion in advance appropriations over the years 1999–2003 to fully fund capital asset acquisitions and related project costs in NASA.

*Human Space Flight (International Space Station).*—This budget requests \$2.1 billion in 1998 and \$6.8 billion in advance appropriations over the years 1999–2002 to fully fund the remaining costs of the International Space Station. This will be an international laboratory in low earth orbit on which American, Russian, Canadian, European, and Japanese astronauts will conduct unique scientific and technological investigations in a microgravity environment. During 1993 the program underwent a major redesign to reduce program costs. The first launch to begin construction of the Station is scheduled for late 1997 and final assembly by 2002. Advance appropriations will enable NASA to complete the program as promised, on schedule, and within the \$2.1 billion annual and \$17.4 billion total program constraints. Congress has already appropriated \$8.5 billion through 1997.

*Science, Aeronautics, and Technology.*—This budget requests \$457 million in budget authority for 1998 and \$934 million in advance appropriations over the years 1999–2002 to fully fund its activities.

*Space Infrared Telescope Facility (SIRTF).*—SIRTF is the last of four major space observatories being built by NASA. It has been the highest priority new mission in astrophysics for many years and will conduct infrared astronomy from space. The project will provide major improvements in sensitivity over previous infrared missions and will enable observations of previously hidden portions of the universe. SIRTF is presently planning for launch in 2002, and is expected to have a 2.5-year lifetime. The Administration is requesting \$489 million from 1998 through 2002 to build and launch the telescope.

*Stratospheric Observatory for Infrared Astronomy (SOFIA).*—SOFIA will fly in the Earth's stratosphere, between 41,000 and 45,000 feet, carrying a 98-inch (2.5 meter) telescope to view objects in the universe in the infrared region of the electromagnetic spectrum. At this altitude, in the clear, dry environment on the very edge of space, SOFIA will enable scientists to study radiant heat patterns from stars, planets and other celestial sources. With up to 160 flights annually and operational lifetime in excess of 20 years, SOFIA will be able to conduct a wide array of scientific investigations and provide hands-on, real-world educational opportunities for an anticipated 500 teachers and students. Total development cost will be \$235 million, with \$51 million already appropriated and the remaining \$184 million being sought for 1998 through 2001. The first flight is expected in 2001.

*X-33 Experimental Launch Vehicle.*—The X-33 is a half-scale experimental launch vehicle that is intended to pave the way for a full scale reusable launch vehicle after the turn of the century. Such a vehicle could dramatically reduce the cost of putting payloads into space. The X-33 is scheduled to make as many as fifteen flights during a 10-month period, beginning in March 1999. It will fly up to 15 times the speed of sound at altitudes approaching 50 miles. Total project cost for development and flight tests is \$1,076 million. Congress appropriated \$357 million through 1997 and the Administration is requesting \$719 million for the remaining funds for 1998 through 2000.

*Mission Support.*—The Tracking and Data Relay Satellite (TDRS) (H, I, J) system is a constellation of geosynchronous satellites that primarily provides NASA's communications needs between its spacecrafts in low-earth orbit and associated ground controllers. TDRS satellites H, I and J will replace satellites currently in orbit starting in 1999. Total cost for the development of the three spacecrafts and the associated launch services is \$937 million. Congress has appropriated \$380 million through 1997 and the Administration is requesting the remaining \$557 million from 1998 through 2003 in regular and advance appropriations.

## Appendix to Part II: PRINCIPLES OF BUDGETING FOR CAPITAL ASSET ACQUISITIONS

### Introduction and Summary

The Administration plans to use the following principles in budgeting for capital asset acquisitions. These principles address planning, costs and benefits, financing, and risk management requirements that should be satisfied before a proposal for the acquisition of capital assets can be included in the Administration's budget. A Glossary describes key terms. A "Capital Programming Guide" is being developed that will provide detailed information on future planning and acquisition of capital assets.

The principles are organized in the following four sections:

*A. Planning.* This section focuses on the need to ensure that capital assets support core/priority missions of the agency; the assets have demonstrated a projected return on investment that is clearly equal to or better than alternative uses of available public resources; the risk associated with the assets is understood and managed at all stages; and the acquisition is implemented in phased, successive segments, unless it can be demonstrated there are significant economies of scale at acceptable risk from funding more than one segment or there are multiple units that need to be acquired at the same time.

*B. Costs and Benefits.* This section emphasizes that the asset should be justified primarily by benefit-cost analysis, including life-cycle costs; that all costs are understood in advance; and that cost, schedule, and performance goals are identified that can be measured using an earned value management system or similar system.

*C. Principles of Financing.* This section stresses that useful segments are to be fully funded with regular or advance appropriations or both, enforced by a proposed new Budget Enforcement Act scorekeeping rule; that as a general rule, planning segments should be financed separately from procurement of the asset; and that agencies are encouraged to aggregate assets in capital acquisition accounts and take other steps to accommodate lumpiness or "spikes" in funding for justified acquisitions.

*D. Risk Management.* This section is to help ensure that risk is analyzed and managed carefully in the acquisition of the asset. Strategies can include separate accounts for capital asset acquisitions, the use of apportionment to encourage sound management, and the selection of efficient types of contracts and pricing mechanisms in order to allocate risk appropriately between the contractor and the Government. In addition cost, schedule, and performance goals are to be controlled and monitored by using an earned value management system or a similar system; and if progress toward these goals is not met there is a formal review process to evaluate whether the acquisition should continue or be terminated.

A Glossary defines key terms, including capital assets. As defined here, capital assets are land, struc-

tures, equipment, and intellectual property (including software) that are used by the Federal Government, including weapon systems. Not included are grants to States or others for their acquisition of capital assets.

### A. Planning

Investments in major capital assets proposed for funding in the Administration's budget should:

1. support core/priority mission functions that need to be performed by the Federal Government;
2. be undertaken by the requesting agency because no alternative private sector or governmental source can support the function more efficiently;
3. support work processes that have been simplified or otherwise redesigned to reduce costs, improve effectiveness, and make maximum use of commercial, off-the-shelf technology;
4. demonstrate a projected return on the investment that is clearly equal to or better than alternative uses of available public resources. Return may include: improved mission performance in accordance with measures developed pursuant to the Government Performance and Results Act; reduced cost; increased quality, speed, or flexibility; and increased customer and employee satisfaction. Return should be adjusted for such risk factors as the project's technical complexity, the agency's management capacity, the likelihood of cost overruns, and the consequences of under- or non-performance.
5. for information technology investments, be consistent with Federal, agency, and bureau information architectures which: integrate agency work processes and information flows with technology to achieve the agency's strategic goals; reflect the agency's technology vision and year 2000 compliance plan; and specify standards that enable information exchange and resource sharing, while retaining flexibility in the choice of suppliers and in the design of local work processes;
6. reduce risk by: avoiding or isolating custom-designed components to minimize the potential adverse consequences on the overall project; using fully tested pilots, simulations, or prototype implementations when necessary before going to production; establishing clear measures and accountability for project progress; and, securing substantial involvement and buy-in throughout the project from the program officials who will use the system;

7. be implemented in phased, successive segments as narrow in scope and brief in duration as practicable, each of which solves a specific part of an overall mission problem and delivers a measurable net benefit independent of future segments, unless it can be demonstrated that there are significant economies of scale at acceptable risk from funding more than one segment or there are multiple units that need to be acquired at the same time; and
8. employ an acquisition strategy that appropriately allocates risk between the Government and the contractor, effectively uses competition, ties contract payments to accomplishments, and takes maximum advantage of commercial technology.

Prototypes require the same justification as other capital assets.

As a general presumption, OMB will recommend new or continued funding only for those capital asset investments that satisfy these criteria. Funding for those projects will be recommended on a phased basis by segment, unless it can be demonstrated that there are significant economies of scale at acceptable risk from funding more than one segment or there are multiple units that need to be acquired at the same time. (For more information, see the discussion of “economically and programmatically separable segments,” in OMB Circular A-11, Part 3, “Planning, Budgeting and Acquisition of Fixed Assets,” July 1996, and the Glossary entry, “capital project and useful segments of a capital project.”)

OMB recognizes that many agencies are in the middle of ongoing projects, and they may not be able immediately to satisfy the criteria. For those projects that do not satisfy the criteria, OMB will consider requests to use 1997 and 1998 funds to finance additional planning, as necessary, to support the establishment of realistic cost, schedule, and performance goals for the completion of the project. This planning could include: the redesign of work processes, the evaluation of alternative solutions, the development of information system architectures, and, if necessary, the purchase and evaluation of prototypes. Realistic goals are necessary for agency portfolio analysis to determine the viability of the project, to provide the basis for fully funding the project to completion, and setting the baseline for management accountability to deliver the project within goals.

Because OMB considers this information essential to agencies' long-term success, OMB will use this information both in preparing the Administration's budget and, in conjunction with cost, schedule, and performance data, as apportionments are made. Agencies are encouraged to work with their OMB representative to arrive at a mutually satisfactory process, format, and timetable for providing the requested information.

## B. Costs and Benefits

The justification of the project should evaluate and discuss the extent to which the project meets the above criteria and should also include:

1. an analysis of the project's total life-cycle costs and benefits, including the total budget authority required for the asset, consistent with policies described in OMB Circular A-94: “Guidelines and Discount Rates for Benefit-Cost Analysis of Federal Programs” (October 1992);
2. an analysis of the risk of the project including how risks will be isolated, minimized, monitored, and controlled, and, for major programs, an evaluation and estimate by the Chief Financial Officer of the probability of achieving the proposed goals;
3. if, after the planning phase, the procurement is proposed for funding in segments, an analysis showing that the proposed segment is economically and programmatically justified—that is, it is programmatically useful if no further investments are funded, and in this application its benefits exceed its costs; and
4. show cost, schedule, and performance goals for the project (or the useful segment being proposed) that can be measured throughout the acquisition process using an earned value management system or similar system. Earned value is described in OMB Circular A-11, Part 3, “Planning, Budgeting and Acquisition of Fixed Assets,” (July 1996), Appendix 300C.

## C. Principles of Financing

### *Principle 1: Full Funding*

*Budget authority sufficient to complete a useful segment of a capital project (or the entire capital project, if it is not divisible into useful segments) must be appropriated before any obligations for the useful segment (or project) may be incurred.*

**Enforcement:** This budget proposes a new Budget Enforcement Act scorekeeping rule to enforce this principle. The proposed rule is the following:

“An appropriations act that provides only partial funding for a useful segment of a capital project will be scored for the estimated total budget authority for the useful segment in the fiscal year in which the partial funding is provided, unless the appropriation language clearly prohibits obligations from being incurred until complete funding for the useful segment is provided.

“A useful segment of a capital project is defined as a component of a capital project that provides either:

- information that allows the agency to plan the capital project, develop the design, and assess the

benefits, costs, and risks before proceeding to full acquisition of the useful asset (or canceling the acquisition). This information comes from activities, or planning segments, that include but are not limited to market research of available solutions, architectural drawings, geological studies, engineering and design studies, and prototypes. Because of uncertainty regarding the identification of separate planning segments for research and development activities, the application of full funding concepts to research and development planning will need more study pending preparation of the 1999 budget; or

- a useful asset for which the benefits exceed the costs even if no further funding is appropriated.”

**Explanation:** Good budgeting requires that appropriations for the full costs of asset acquisition be enacted in advance to help ensure that all costs and benefits are fully taken into account at the time decisions are made to provide resources. Full funding with regular appropriations in the budget year also leads to tradeoffs within the budget year with spending for other capital assets and with spending for purposes other than capital assets. Full funding increases the opportunity to use performance-based fixed price contracts, allows for more efficient work planning and management of the capital project, and increases the accountability for the achievement of the baseline goals.

When full funding is not followed and capital projects or useful segments are funded in increments, without certainty if or when future funding will be available, the result is sometimes poor planning, acquisition of assets not fully justified, higher acquisition costs, cancellation of major projects, the loss of sunk costs, or inadequate funding to maintain and operate the assets.

**Principle 2: Regular and Advance Appropriations**

*Regular appropriations for the full funding of a capital project or a useful segment of a capital project in the budget year are preferred. If this results in spikes that, in the judgment of OMB, cannot be accommodated by the agency or the Congress, a combination of regular and advance appropriations that together provide full funding for a capital project or a useful segment should be proposed in the budget.*

**Explanation:** Principle 1 (Full Funding) is met as long as a combination of regular and advance appropriations provide budget authority sufficient to complete the capital project or useful segment. Full funding in the budget year with regular appropriations alone is preferred because it leads to tradeoffs within the budget year with spending for other capital assets and with spending for purposes other than capital assets. In contrast, full funding for a capital project over several years with regular appropriations for the first year and advance appropriations for subsequent years may bias tradeoffs in the budget year in favor of the proposed asset because with advance appropriations the full cost of the asset is not included in the budget

year. Advance appropriations, because they are scored in the year they become available for obligation, may constrain the budget authority and outlays available for regular appropriations of that year.

If, however, the lumpiness caused by regular appropriations cannot be accommodated within an agency or Appropriations Subcommittee, advance appropriations can ameliorate that problem while still providing that all of the budget authority is enacted in advance for the capital project or useful segment. The latter helps ensure that agencies develop appropriate plans and budgets and that all costs and benefits are identified prior to providing resources. In addition, amounts of advance appropriations can be matched to funding requirements for completing natural components of the useful segment. Advance appropriations have the same benefits as regular appropriations for improved planning, management, and accountability of the project.

**Principle 3: Separate Funding of Planning Segments**

*As a general rule, planning segments of a capital project should be financed separately from the procurement of a useful asset.*

**Explanation:** The agency must have information that allows it to plan the capital project, develop the design, and assess the benefits, costs, and risks before proceeding to procurement of the useful asset. This is especially important for high risk acquisitions. This information comes from activities, or planning segments, that include but are not limited to market research of available solutions, architectural drawings, geological studies, engineering and design studies, and prototypes. The construction of a prototype that is a capital asset, because of its cost and risk, should be justified and planned as carefully as the project itself. The process of gathering information for a capital project may consist of one or more planning segments, depending on the nature of the asset. Funding these segments separately will help ensure that the necessary information is available to establish cost, schedule, and performance goals before proceeding to procurement.

If budget authority for planning segments and procurement of the useful asset are enacted together, OMB may wish to apportion budget authority for one or several planning segments separately from procurement of the useful asset.

**Principle 4: Accommodation of Lumpiness or “Spikes” and Separate Capital Acquisition Accounts**

*To accommodate lumpiness or “spikes” in funding justified capital acquisitions, agencies, working with OMB, are encouraged to aggregate financing for capital asset acquisitions in one or several separate capital acquisition budget accounts within the agency, to the extent possible within the agency’s total budget request.*

**Explanation:** Large, temporary, year-to-year increases in budget authority, sometimes called lumps

or spikes, may create a bias against the acquisition of justified capital assets. Agencies, working with OMB, should seek ways to avoid this bias and accommodate such spikes for justified acquisitions. Aggregation of capital acquisitions in separate accounts may:

- reduce spikes within an agency or bureau by providing roughly the same level of spending for acquisitions each year;
- help to identify the source of spikes and to explain them. Capital acquisitions are more lumpy than operating expenses; and with a capital acquisition account, it can be seen that an increase in operating expenses is not being hidden and attributed to one-time asset purchases;
- reduce the pressure for capital spikes to crowd out operating expenses; and
- improve justification and make proposals easier to evaluate, since capital acquisitions are generally analyzed in a different manner than operating expenses (e.g., capital acquisitions have a longer time horizon of benefits and life-cycle costs).

#### D. Risk Management

Risk management should be central to the planning, budgeting, and acquisition process. Failure to analyze and manage the inherent risk in all capital asset acquisitions may contribute to cost overruns, schedule shortfalls, and acquisitions that fail to perform as expected. For each major capital project a risk analysis that includes how risks will be isolated, minimized, monitored, and controlled may help prevent these problems.

The project cost, schedule and performance goals established through the planning phase of the project are the basis for approval to procure the asset and the basis for assessing risk. During the procurement phase performance-based management systems (earned value or similar system) must be used to provide contractor and Government management visibility on the achievement of, or deviation from, goals until the asset is accepted and operational. If goals are not being met, performance-based management systems allow for early identification of problems, potential corrective actions, and changes to the original goals needed to complete the project and necessary for agency portfolio analysis decisions. These systems also allow for Administration decisions to recommend meaningful modifications for increased funding to the Congress, or termination of the project, based on its revised expected return on investment in comparison to alternative uses of the funds. Agencies must ensure that the necessary acquisition strategies are implemented to reduce the risk of cost escalation and the risk of failure to achieve schedule and performance goals. These strategies may include:

1. having budget authority appropriated in separate capital asset acquisition accounts;
2. apportioning budget authority for a useful segment;

3. establishing thresholds for cost, schedule, and performance goals of the acquisition, including return on investment, which if not met may result in cancellation of the acquisition;
4. selecting types of contracts and pricing mechanisms that are efficient and that provide incentives to contractors in order to allocate risk appropriately between the contractor and the Government;
5. monitoring cost, schedule, and performance goals for the project (or the useful segment being proposed) using an earned value management system or similar system. Earned value is described in OMB Circular A-11, Part 3, "Planning, Budgeting and Acquisition of Fixed Assets" (July 1996), Appendix 300C; and
6. if progress is not within 90 percent of goals, or if new information is available that would indicate a greater return on investment from alternative uses of funds, institute senior management review of the project through portfolio analysis to determine the continued viability of the project with modifications, or the termination of the project, and the start of exploration for alternative solutions if it is necessary to fill a gap in agency strategic goals and objectives.

#### E. Glossary

##### **Appropriations**

An appropriation provides budget authority that permits Government officials to incur obligations that result in immediate or future outlays of Government funds.

**Regular annual appropriations:** These appropriations are:

- enacted normally in the current year;
- scored entirely in the budget year; and
- available for obligation in the budget year and subsequent years if specified in the language. (See "Availability," below.)

**Advance appropriations:** Advance appropriations may be accompanied by regular annual appropriations to provide funds available for obligation in the budget year as well as subsequent years. Advance appropriations are:

- enacted normally in the current year;
- scored after the budget year (e.g., in each of one, two, or more later years, depending on the language); and
- available for obligation in the year scored and subsequent years if specified in the language. (See "Availability," below.)

**Availability:** Appropriations made in appropriations acts are available for obligation only in the budget year unless the language specifies that an appropriation is available for a longer period. If the language specifies that the funds are to remain available until the end

of a certain year beyond the budget year, the availability is said to be “multi-year.” If the language specifies that the funds are to remain available until expended, the availability is said to be “no-year.” Appropriations for major procurements and construction projects are typically made available for multiple years or until expended.

### **Capital Assets**

Capital assets are land, structures, equipment, and intellectual property (including software) that are used by the Federal Government and have an estimated useful life of two years or more. Capital assets exclude items acquired for resale in the ordinary course of operations or held for the purpose of physical consumption such as operating materials and supplies. The cost of a capital asset includes both its purchase price and all other costs incurred to bring it to a form and location suitable for its intended use.

Capital assets may be acquired in different ways: through purchase, construction, or manufacture; through a lease-purchase or other capital lease, regardless of whether title has passed to the Federal Government; through an operating lease for an asset with an estimated useful life of two years or more; or through exchange. Capital assets include leasehold improvements and land rights; assets owned by the Federal Government but located in a foreign country or held by others (such as Federal contractors, state and local governments, or colleges and universities); and assets whose ownership is shared by the Federal Government with other entities. Capital assets include not only the assets as initially acquired but also additions; improvements; replacements; rearrangements and re-installations; and major repairs but not ordinary repairs and maintenance.

Examples of capital assets include the following, but are not limited to them:

- office buildings, hospitals, laboratories, schools, and prisons;
- dams, power plants, and water resources projects;
- furniture, elevators, and printing presses;
- motor vehicles, airplanes, and ships;
- satellites and space exploration equipment;
- information technology hardware and software; and
- Department of Defense weapons systems.

Capital assets may or may not be capitalized (i.e., recorded in an entity’s balance sheet) under Federal accounting standards. Examples of capital assets not capitalized are Department of Defense weapons systems, heritage assets, stewardship land, and some software.

Capital assets do not include grants for acquiring capital assets made to state and local governments or other entities (such as National Science Foundation grants to universities or Department of Transportation grants to AMTRAK). Capital assets also do not include intangible assets such as the knowledge resulting from research and development or the human capital resulting from education and training, although capital assets

do include land, structures, equipment, and intellectual property (including software) that the Federal Government uses in research and development and education and training.

### **Capital Project and Useful Segments of a Capital Project**

The total capital project, or acquisition of a capital asset, includes useful segments that are either planning segments or useful assets.

**Planning segments:** A planning segment of a capital project provides information that allows the agency to develop the design; assess the benefits, costs, and risks; and establish realistic baseline cost, schedule, and performance goals before proceeding to full acquisition of the useful asset (or canceling the acquisition). This information comes from activities, or planning segments, that include but are not limited to market research of available solutions, architectural drawings, geological studies, engineering and design studies, and prototypes. The process of gathering information for a capital project may consist of one or more planning segments, depending on the nature of the asset. If the project includes a prototype that is a capital asset, the prototype may itself be one segment or may be divisible into more than one segment. Because of uncertainty regarding the identification of separate planning segments for research and development activities, the application of full funding concepts to research and development planning will need more study pending preparation of the 1999 budget.

**Useful asset:** A useful asset is an economically and programmatically separate segment of the asset procurement stage of the capital project that provides an asset for which the benefits exceed the costs, even if no further funding is appropriated. The total capital asset procurement may include one or more useful assets, although it may not be possible to divide all procurements in this way. Illustrations follow:

*Illustration 1:* If the construction of a building meets the justification criteria and has benefits greater than its costs without further investment, then the construction of that building is a “useful segment.” Excavation is not a useful segment because no useful asset results from the excavation alone if no further funding becomes available. For a campus of several buildings, a useful segment is one complete building if that building has programmatic benefits that exceed its costs regardless of whether the other buildings are constructed, even though that building may not be at its maximum use.

*Illustration 2:* If the full acquisition is for several items (e.g., aircraft), the useful segment would be the number of complete aircraft required to achieve benefits that exceed costs even if no further funding becomes available. In contrast, some portion of several aircraft (e.g., engines for five aircraft) would not be a useful segment if no further funding is available, nor would one aircraft be a useful segment if two or more are required for benefits to exceed costs.

*Illustration 3:* For information technology, a module (the information technology equivalent of “useful segment”) is separable if it is useful in itself without subsequent modules. The module should be designed so that it can be enhanced or integrated with subsequent modules if future funding becomes available.

### **Earned Value**

Earned value refers to a performance-based management system for establishing baseline cost, schedule, and performance goals for a capital project and measuring progress against the goals. Earned value is described in OMB Circular A-11, Part 3, “Planning, Budgeting and Acquisition of Fixed Assets” (July 1996), Appendix 300C.

### **Funding**

**Full funding:** Full funding means that appropriations—regular appropriations or advance appropriations—are enacted that are sufficient in total to complete a useful segment of a capital project before any obligations may be incurred for that segment. Full funding for an entire capital project is required if the project cannot be divided into more than one useful segment. If the asset can be divided into more than one useful segment, full funding for a project may be desirable, but is not required to constitute full funding.

**Incremental (partial) funding:** Incremental (partial) funding means that appropriations—regular appropriations or advance appropriations—are enacted for just part of a useful segment of a capital project, if the project has useful segments, or for part of the capital project as a whole, if it is not divisible into useful

segments. Under incremental funding for a capital asset, which is not permitted under these principles, the funds could be obligated to start the segment (or project) despite the fact that they are insufficient to complete a useful segment or project.

### **Risk Management**

Risk management is an organized method of identifying and measuring risk and developing, selecting, and managing options for handling these risks. Before beginning any procurement, managers should review and revise as needed the acquisition plan to ensure that risk management techniques considered in the planning phase are still appropriate.

There are three key principles for managing risk when procuring capital assets: (1) avoiding or limiting the amount of development work; (2) making effective use of competition and financial incentives; and (3) establishing a performance-based acquisition management system that provides for accountability for program successes and failures, such as an earned value system or similar system.

There are several types of risk an agency should consider as part of risk management. The types of risk include:

- schedule risk;
- cost risk;
- technical feasibility;
- risk of technical obsolescence;
- dependencies between a new project and other projects or systems (e.g., closed architectures); and
- risk of creating a monopoly for future procurement.

### Part III: FEDERALLY FINANCED CAPITAL STOCKS

Federal investment spending 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.

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 activities, 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 beginning with pre-school education and extending through graduate studies and adult education. 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. A 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 assets that do not have a private market, such as highways or weapons systems.

In contrast to physical and R&D stocks, the estimate of the education stock is based on the replacement cost method. Data on the total years of education of 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 uncertainty about the useful lives and depreciation rates of different types of assets, incomplete data for historical outlays, and imprecision in the deflators used to express costs in constant dollars.

#### 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 6-6 shows the value of the net federally financed physical capital stock since 1960, in constant fiscal year 1992 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 \$1,497 billion in 1995 and is estimated to decline slightly to \$1,454 billion by 1998. In 1996, the national defense capital stock accounted for \$672 billion, or 45 percent of the total, and nondefense stocks for \$819 billion, or 55 percent of the total.

Real stocks of defense and nondefense capital show very different trends. Nondefense stocks have grown consistently since 1970, increasing from \$366 billion in 1970 to \$819 billion in 1996. With the investments proposed in the budget, nondefense stocks are estimated to grow to \$847 billion in 1998. During the 1970s, the nondefense capital stock grew at an average annual rate of 4.5 percent. In the 1980s, however, the growth rate slowed to just over half that rate, or 2.3 percent annually, with growth continuing at about that rate since then.

Real 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 the early 1980s, however, a large defense buildup began to increase the stock of defense capital. By 1988, the defense stock had exceeded its size at the height of the Vietnam War. In the last few years, depreciation on this increased stock and a slower pace of defense investment have begun to reduce the stock somewhat from its recent levels. The stock is estimated to fall from \$672 billion in 1996 to \$607 billion in 1998.

Another trend in the Federal physical capital stocks is the shift from direct Federal assets to grant-financed assets. In 1960, 49 percent of federally financed nondefense capital was owned by the Federal Government, and 51 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

<sup>3</sup>Constant dollar stock estimates are expressed in chained 1992 dollars, consistent with the revisions to the National Income and Product Accounts (NIPAs) released in January 1996.

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

(In billions of 1992 dollars)

Fiscal Year	Total	National Defense	Nondefense								
			Total Non-defense	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 .....	785	581	205	101	62	39	104	68	16	12	8
1965 .....	864	583	281	119	71	47	162	123	19	11	10
1970 .....	963	597	366	131	80	52	235	178	28	12	16
1975 .....	959	513	446	143	89	54	303	212	49	23	19
1980 .....	1,007	440	567	165	105	60	402	249	83	52	18
1985 .....	1,155	513	642	183	111	72	459	278	99	66	16
Annual data:											
1990 .....	1,405	691	714	211	114	97	503	311	104	73	16
1991 .....	1,443	715	728	217	114	102	511	316	103	74	17
1992 .....	1,473	728	745	227	116	110	518	322	103	75	18
1993 .....	1,491	729	761	235	116	118	527	329	103	75	21
1994 .....	1,496	718	778	240	116	124	538	336	103	75	24
1995 .....	1,497	698	799	247	116	131	552	344	104	76	29
1996 .....	1,491	672	819	254	115	139	565	351	105	75	34
1997 est. ....	1,479	641	838	261	114	147	577	358	106	74	40
1998 est. ....	1,454	607	847	261	112	149	586	363	106	73	45

Federal investments by agencies such as the Bureau of Reclamation and Corps of Engineers, shifted the composition of the stock substantially. In 1996, 31 percent of the nondefense stock was owned by the Federal Government and 69 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 6-7 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. The reduced amount of net investment in 1998 reflects the sale of the United States Enrichment Corporation and the privatization of the Elk Hills gas and oil field. 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 estimated depreciation. The net investment in this table is the change in the net nondefense physical capital stock displayed in Table 6-6.

### 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 6-8, the R&D capital stock financed by Federal outlays is estimated to be \$792 billion in 1996 in constant 1992 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 1996 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 nondefense R&D stock is actually the larger of the two, because of the different emphasis on basic research and applied research and development. Defense R&D spending is heavily concentrated in applied research and development, which depreciates much more quickly than basic research. The stock of 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 tapered off, depreciation has grown, and, as a result, the net defense R&D stock has stabilized.

The growth of the nondefense R&D stock slowed from the 1970s to the late 1980s, from an annual rate of 3.7 percent in the 1970s to a rate of 1.8 percent from 1980 to 1988. Gross investment in real terms fell during much of the 1980s, and about three-fourths of new

**Table 6-7. COMPOSITION OF GROSS AND NET FEDERAL AND FEDERALLY FINANCED NONDEFENSE PUBLIC PHYSICAL INVESTMENT**

(In billions of 1992 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	
<b>Five year intervals:</b>																
1960 .....	21.2	7.9	13.3	6.2	3.9	2.3	1.2	1.1	15.0	4.0	11.0	11.2	-0.4	-0.2	0.4	
1965 .....	30.4	10.7	19.6	9.2	4.8	4.4	1.9	2.5	21.2	6.0	15.2	13.5	1.5	-*	0.3	
1970 .....	30.1	14.3	15.9	6.4	5.7	0.7	0.9	-0.2	23.7	8.6	15.1	9.3	4.1	0.4	1.3	
1975 .....	31.5	17.6	13.9	9.3	6.4	2.9	2.5	0.4	22.2	11.2	11.1	4.1	3.1	3.6	0.4	
1980 .....	44.8	20.6	24.2	11.3	6.9	4.4	2.6	1.8	33.5	13.7	19.7	8.3	6.1	5.9	-0.5	
1985 .....	42.7	24.8	17.9	13.3	7.9	5.4	0.9	4.5	29.4	16.9	12.5	8.1	2.7	2.2	-0.5	
<b>Annual data:</b>																
1990 .....	43.0	29.7	13.4	15.2	9.6	5.6	0.8	4.8	27.8	20.1	7.7	5.9	0.1	0.8	0.9	
1991 .....	44.5	30.7	13.7	16.1	10.1	6.1	0.2	5.8	28.3	20.7	7.7	5.7	-0.1	0.9	1.1	
1992 .....	49.3	31.9	17.4	20.3	10.6	9.7	1.6	8.0	29.1	21.3	7.7	5.7	-0.1	0.7	1.5	
1993 .....	49.7	33.2	16.6	19.2	11.2	8.0	0.3	7.6	30.6	22.0	8.6	6.6	-0.4	0.3	2.1	
1994 .....	51.3	34.4	16.9	17.1	11.7	5.4	-0.7	6.1	34.2	22.7	11.5	7.2	0.2	0.1	3.9	
1995 .....	56.4	35.7	20.7	19.0	12.2	6.8	0.2	6.6	37.4	23.5	13.9	8.1	0.8	0.5	4.5	
1996 .....	57.2	37.1	20.1	20.0	12.7	7.3	-0.7	8.0	37.2	24.3	12.9	7.4	0.9	-0.6	5.2	
1997 est. ....	57.1	38.5	18.7	20.1	13.3	6.8	-1.4	8.1	37.0	25.1	11.9	6.4	0.9	-0.9	5.5	
1998 est. ....	48.9	39.6	9.3	14.0	13.8	0.2	-1.9	2.1	35.0	25.8	9.1	4.9	0.4	-1.2	4.9	

\* \$50 million or less.

**Table 6-8. NET STOCK OF FEDERALLY FINANCED RESEARCH AND DEVELOPMENT <sup>1</sup>**

(In billions of 1992 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
<b>Five year intervals:</b>									
1970 .....	235	14	221	194	61	133	429	75	354
1975 .....	249	19	230	237	88	149	486	107	379
1980 .....	252	22	229	280	119	161	532	141	390
1985 .....	287	27	260	304	157	148	592	184	408
<b>Annual data:</b>									
1990 .....	357	32	325	342	205	137	699	237	461
1991 .....	361	33	328	354	216	138	716	249	466
1992 .....	365	34	331	367	227	139	732	262	470
1993 .....	368	36	333	380	239	142	748	274	474
1994 .....	371	37	334	393	250	144	764	287	477
1995 .....	372	38	334	407	260	147	779	298	480
1996 .....	374	39	335	418	271	147	792	310	482
1997 est. ....	375	40	334	431	282	148	805	323	483
1998 est. ....	373	42	332	444	293	150	817	335	482

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

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 6-9, the federally financed education stock is estimated at \$803 billion in 1996 in constant 1992 dollars, rising to \$850 billion in 1998. The vast majority of the Nation's education stock is financed by State and local governments, and by stu-

dents 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.

Despite a slowdown in growth during the early 1980s, the stock grew at an average annual rate of 5.0 percent from 1970 to 1996, 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 6-9. NET STOCK OF FEDERALLY FINANCED EDUCATION CAPITAL**

(In billions of 1992 dollars)

Fiscal Year	Total Education Stock	Elementary and Secondary Education	Higher Education
Five year intervals:			
1960 .....	70	52	18
1965 .....	99	73	26
1970 .....	224	179	46
1975 .....	307	251	57
1980 .....	414	326	88
1985 .....	510	383	126
Annual data:			
1990 .....	661	490	171
1991 .....	682	503	179
1992 .....	701	515	186
1993 .....	726	528	198
1994 .....	748	543	205
1995 .....	777	557	221
1996 .....	803	572	232
1997 est. ....	824	585	240
1998 est. ....	850	600	251

### Methodological Note

This note provides further technical detail about the estimation of the capital stock series presented in Tables 6-6 through 6-9.

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 1992 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 1992 prices. Although source data for the NIPA deflators were revised in January 1996 as part of a

comprehensive statistical revision, the revised data only extended back to 1960. Price measures prior to 1960 were estimated based on pre-revision data.

**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. With the January 1996 comprehensive revision of the NIPAs, government investment has taken 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 bud-

<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.

et, 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 used to convert historical outlays to constant 1992 dollars were based on composite NIPA deflators for Federal, State, and local consumption of durables and gross investment. Data consistent with the January 1996 NIPA revisions were only available back to fiscal year 1960, so deflators prior to 1960 were extrapolated based on pre-revision NIPA data extending back to 1930. For 1915 through 1929, deflators were estimated from Census Bureau historical statistics on constant price public capital formation.

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 non-defense 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 chained price index for gross domestic product (GDP) in fiscal year 1992 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> More 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>

### **Education Capital Stocks**

**Method of estimation.**—The estimates of the federally financed education capital stock in Table 6–9 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 6–9 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.

<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.

## 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 6–10 compares total Federal investment as defined in this chap-

ter with investment in Federal capital, which was defined as “capital assets” in Part II of this chapter, and with investment in national capital.

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 necessarily 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 capital assets, which is a different subject, is discussed

**Table 6–10. ALTERNATIVE DEFINITIONS OF INVESTMENT OUTLAYS, 1998**

(In millions of dollars)

	All Federal investment	Federal capital	National capital
Construction and rehabilitation:			
Grants:			
Transportation .....	24,486	.....	24,486
Natural resources and environment .....	2,194	.....	2,192
Community and regional development .....	5,811	.....	1,087
Housing assistance .....	5,999	.....	.....
Other grants .....	183	.....	99
Direct Federal:			
National defense .....	4,522	4,522	.....
General science, space, and technology .....	423	335	423
Natural resources and environment .....	3,699	2,215	3,476
Energy .....	1,147	1,147	1,147
Transportation .....	675	344	675
Veterans and other health facilities .....	1,418	1,418	1,418
Postal Service .....	1,251	1,251	1,251
GSA real property activities .....	1,262	1,262	.....
Other construction .....	2,347	1,440	599
Total construction and rehabilitation .....	55,417	13,934	36,853
Acquisition of major equipment (direct):			
National defense .....	43,408	43,408	.....
Postal Service .....	1,378	1,378	1,378
Air transportation .....	1,903	1,903	1,903
Other .....	3,474	3,156	2,139
Total major equipment .....	50,163	49,845	5,420
Purchase or sale of land and structures .....	–3,962	–3,962	.....
Other physical assets (grants) .....	1,208	.....	.....
Total physical investment .....	102,826	59,817	42,344
Research and development:			
Defense .....	37,416	.....	1,153
Nondefense .....	32,790	.....	32,167
Total research and development .....	70,206	.....	33,320
Education and training .....	45,630	.....	45,172
Total investment outlays .....	218,662	59,817	120,836

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 Federal 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 capital assets. It excludes Federal grants to States for infrastructure, such as highways, and it excludes intangible investment, such as education and research. Investment in Federal capital in 1998 is estimated to be \$60 billion, or 27 percent of the total Federal investment outlays shown in Table 6-1. Of the investment in Federal capital, 80 percent is for defense and 20 percent for nondefense purposes.

### A Capital Budget for Capital Assets

Discussion of a capital budget has often centered on Federal capital, called "capital assets" in Part II of this chapter—buildings, other construction, and equipment that support the delivery of 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 special purpose capital such as weapons systems, military bases, the space station, and dams. This definition excludes capital that the Federal Government has financed but does not own.<sup>8</sup>

Some capital budget proposals would partition the unified budget into a capital budget, an operating budget, and a total budget. Table 6-11 illustrates such a capital budget for capital 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 capital 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 operating budget deficit is higher than the unified budget deficit, 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 6-11 and the subsequent tables of this section are rough estimates, intended only to be illustrative and to provide a basis for broad generalizations.

**Table 6-11. CAPITAL, OPERATING, AND UNIFIED BUDGETS: FEDERAL CAPITAL, 1998<sup>1</sup>**

(In billions of dollars)

<b>Operating Budget</b>	
Receipts .....	1,567
Expenses:	
Depreciation .....	99
Other .....	1,628
Subtotal, expenses .....	1,727
Surplus or deficit (-) .....	-160
<b>Capital Budget</b>	
Income: depreciation .....	99
Capital expenditures .....	60
Surplus or deficit (-) .....	39
<b>Unified Budget</b>	
Receipts .....	1,567
Outlays .....	1,687
Surplus or deficit (-) .....	-121

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

Some proposals for a capital budget would exclude defense capital (other than military family housing). These exclusions—weapons systems, military bases, and so forth—would comprise nearly four-fifths of the expenditures shown in the capital budget of Table 6-11. If they were excluded, the operating deficit would essentially be the same as the unified budget deficit: about \$1 billion higher than the unified budget deficit instead of \$39 billion higher as shown above for the complete coverage of Federal capital. Excluding defense makes such a large difference because of its large relative size and the recent pattern of capital asset purchases. The large buildup that began in the early 1980s raised the capital stock and depreciation; the buildup was followed by a sharp decline in purchases, while the capital stock and depreciation have declined more slowly. (See the previous section of this chapter.)

<sup>8</sup> This definition of "capital assets" is broader than the definition of "fixed assets" used in last year's budget. Expenditures for capital assets in 1998 under this definition are \$60 billion, as shown in Tables 6-10 and 6-11, compared to \$18 billion under the previous definition. Almost the entire difference is due to weapons systems and other specialized defense investment.

### ***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 capital asset acquisitions in terms of the operating budget instead. When the Government proposed to purchase a capital 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 capital asset may change over a period of years, because either the need was not permanent, it was initially misjudged, or other needs become 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 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 capital 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 capital 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.

<sup>9</sup>The amount of depreciation recorded as an expense in the budget year might be overstated by this illustration. First, most assets are 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 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 capital 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>

### ***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 capital 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

<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 Sweeny, *Handbook of Budgeting* (3rd ed.; New York: Wiley, 1993).

<sup>12</sup>A survey of business practice conducted a few years ago 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 and Sprow also found that such techniques are recommended by the most widely used textbooks in managerial finance.

the investment with the resulting cash inflows expected in the future, as explained above, 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 capital assets over their estimated useful life. With similar objectives in mind, the Office of Management and Budget, the Treasury Department, and the General Accounting Office have adopted 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; 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 and the wide economic base that it taxes. 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 capital 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 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 in 1993 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>

<sup>13</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>14</sup>Governmental Accounting Standards Board (GASB), *Codification of Governmental Accounting and Financial Reporting Standards as of June 30, 1996*, sections 1100.107 and 1400.114–1400.118.

<sup>15</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.” The United Kingdom has announced plans to budget on an accrual basis, including the depreciation for capital assets, beginning with its budget for 2001–02.

<sup>16</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>17</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 consolidated 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

<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>Office of Management and Budget, Statement of Federal Financial Accounting Standards No. 6, *Accounting for Property, Plant, and Equipment* (November 30, 1995), pp. 5–14 and 34–35. 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.

**Conclusions**

It is for reasons such as these that the General Accounting Office issued a report in 1993 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 for national capital, GAO reiterated that conclusion in another study in 1995.<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 that study also focused primarily on what is termed “national capital” in this chapter, its analysis applies equally to “Federal capital.” Last year GAO extended its conclusions to Federal capital as well. “If depreciation were recorded in the federal budget in place of cash requirements for capital spending, this would undermine Congress’ ability to control expenditures because only a small fraction of an asset’s cost would be included in the year when a decision was made to acquire it.”<sup>23</sup>

**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 1993 report, *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>24</sup> GAO defined this investment as “federal spending, either direct or through grants, that is directly intended to enhance the private sector’s long-term productivity.”<sup>25</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>26</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 in 1995.<sup>27</sup>

**Table 6-12. UNIFIED BUDGET WITH NATIONAL INVESTMENT COMPONENT, 1998**  
(In billions of dollars)

Receipts .....	1,567
Outlays:	
National investment .....	121
Other .....	1,567
Subtotal, outlays .....	1,687
Surplus or deficit (-) .....	-121

Table 6-12 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 \$121 billion in 1998. 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, non-profit organizations, or individuals. Only 12 percent of national investment consists of assets to be owned by the Federal Government. Military investment and some

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), pp. 1 and 19-20.

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

<sup>23</sup> GAO, *Budget Issues: Budgeting for Federal Capital*, GAO/AIMD-97-5 (November 1996), p. 28. Also see p. 4.

<sup>24</sup> *Incorporating an Investment Component in the Federal Budget*, pp. 1-2, 9-10, and 15.

<sup>25</sup> *Ibid.*, pp. 1 and 5.

<sup>26</sup> *Ibid.*, pp. 2 and 13-16.

<sup>27</sup> *The Role of Depreciation in Budgeting for Certain Investments*, pp. 2 and 19-20.

other “capital assets” as defined previously are excluded, because that investment does not primarily enhance economic growth.

### A Capital Budget for National Investment

Table 6–13 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>28</sup>

**Table 6–13. CAPITAL, OPERATING, AND UNIFIED BUDGETS: NATIONAL CAPITAL, 1998<sup>1</sup>**  
(In billions of dollars)

<b>Operating Budget</b>	
Receipts .....	1,536
Expenses:	
Depreciation <sup>2</sup> .....	77
Other .....	1,567
Subtotal, expenses .....	1,644
Surplus or deficit (–) .....	–108
<b>Capital Budget</b>	
Income:	
Depreciation <sup>2</sup> .....	77
Earmarked tax receipts <sup>3</sup> .....	31
Subtotal, income .....	108
Capital expenditures .....	121
Surplus or deficit (–) .....	–12
<b>Unified Budget</b>	
Receipts .....	1,567
Outlays .....	1,687
Surplus or deficit (–) .....	–121

<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 explained in Part III of this chapter. Depreciation is measured in terms of current cost.

<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.

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 re-

<sup>28</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.”

solve. 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>29</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 (i.e., saving net of depreciation). A capital budget, it is sometimes contended, is needed for this purpose.

This purpose, however, is now fulfilled by the Federal sector of the national income and product accounts (NIPAs). The NIPA Federal sector is 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* with separate releases for historical data. Estimates for the President’s proposed budget through the budget year are normally published in the budget documents. The NIPA translation of the budget, rather than the budget itself, is ordinarily used by economists to analyze the effect of Government fiscal policy on the aggregate economy.<sup>30</sup>

Until last year the NIPA Federal sector did not divide government purchases of goods and services between consumption and investment. With the comprehensive revision of the national income and product accounts in early 1996, it now makes that distinction.<sup>31</sup> The

<sup>29</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>30</sup>See chapter 17 of this volume, “National Income and Product Accounts,” for the NIPA current account of the Federal Government based on the budget estimates for 1997 and 1998, and for a discussion of the NIPA Federal sector and its relationship to the budget.

<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

revised NIPA Federal sector is a current account or an operating account for the Federal Government. The current account excludes expenditures for structures and equipment owned by the Federal Government; it includes depreciation on the federally owned stock of structures and equipment as a measure of the cost of using capital assets and thus as part of the Federal Government's current expenditures. It applies this treatment to a comprehensive definition of federally owned structures and equipment, both defense and non-defense, similar to the definition of "capital assets" in this chapter.<sup>32</sup> The NIPA "current surplus or deficit" of the Federal Government thus measures the Government's direct contribution to the Nation's net saving (given the definition of investment that is employed). The 1998 Federal sector deficit is estimated to be increased \$14 billion by including depreciation rather than gross investment, because depreciation of federally owned structures and equipment is currently more than gross investment. A capital budget is not needed to capture this effect.

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

As a broad generalization, Tables 6–11 and 6–13 suggest that this rationale would not currently justify much Federal borrowing, if any at all, under the two capital budgets roughly illustrated in this chapter. For *Federal capital*, Table 6–11 indicates that current cost depreciation is more than gross investment for Federal capital—the capital budget surplus is \$39 billion (or \$1 billion excluding defense capital). The rationale of borrowing to finance net investment would not justify the Federal Government borrowing at all to finance its investment in Federal capital; instead, it would have to repay debt in this amount. Together with balancing the operating budget, this would approximately require the Government to eliminate its 1998 borrowing of \$121 billion (the unified budget deficit) and also repay debt of \$39 billion—a total difference of \$160 billion. For *national capital*, table 6–13 indicates that current cost depreciation (plus the excise taxes earmarked to finance capital expenditures for highways and airports and airways<sup>33</sup>) is less than gross investment but almost as large—the capital budget deficit is \$12 billion. The rationale of borrowing to finance net investment would justify the Federal Government borrowing only this amount to finance its investment in national capital. Together with balancing the operating budget, this would approximately require the Government to reduce its borrowing in 1998 from \$121 billion (the unified budget deficit) to \$12 billion.

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

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. Government enterprises are treated differently from general government. 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 that were financed by Federal grants as well as by their own resources.

<sup>33</sup>The capital budget deficit would be about \$13 billion larger if current cost depreciation were used instead of earmarked excise taxes for highways and airports and airways.

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 by nearly two-

<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.

thirds during the past four 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 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 and training, and outlays for the conduct of research and development.

The projections are done generally on a current services basis, which means they are based on 1997 enacted

appropriations and adjusted for inflation in later years. The current services concept is discussed in Chapter 16, "Current Services Estimates."

Federal public physical capital spending was \$115.9 billion in 1996 and is projected to increase to \$126.3 billion by 2007 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 1996.

Table 6-14 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 \$28.1 billion in 1996, and current services outlays are estimated to increase to \$32.7 billion by 2007. Outlays for nondefense housing and buildings were \$11.7 billion in 1996 and are estimated to be \$11.7 billion in 2007 also. Physical capital outlays for other nondefense categories were \$21.1 billion in 1996 and are projected to be \$22.8 billion by 2007. For national defense, this spending was \$55.0 billion in 1996 and is estimated on a current services basis to be \$59.1 billion in 2007.

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

(In billions of dollars)

	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Nondefense:												
Transportation-related categories:												
Roadways and bridges .....	19.7	19.6	19.8	20.0	20.2	20.4	20.7	21.4	21.8	22.3	22.9	23.4
Airports and airway facilities .....	4.2	3.5	3.5	3.5	3.5	3.6	3.8	3.9	4.0	4.1	4.2	4.4
Mass transportation systems .....	3.7	3.9	2.9	3.4	3.3	3.7	3.7	3.7	3.8	3.9	4.0	4.1
Railroads .....	0.6	0.5	0.6	0.7	0.6	0.6	0.7	0.7	0.7	0.7	0.7	0.8
Subtotal, transportation .....	28.1	27.5	26.9	27.6	27.7	28.3	28.9	29.7	30.4	31.1	31.9	32.7
Housing and buildings categories:												
Federally assisted housing .....	6.8	7.2	6.6	6.2	6.1	6.1	6.1	6.3	6.3	6.4	6.5	6.6
Hospitals .....	1.8	1.7	1.6	1.6	1.6	1.7	1.7	1.8	1.9	1.9	2.0	2.1
Public buildings <sup>1</sup> .....	3.1	3.1	3.0	3.1	3.5	3.3	3.1	2.7	2.7	2.8	2.9	3.1
Subtotal, housing and buildings .....	11.7	12.0	11.1	10.8	11.2	11.1	11.0	10.8	10.9	11.2	11.4	11.7
Other nondefense categories:												
Wastewater treatment and related facilities .....	2.8	2.5	2.0	2.3	2.7	3.0	2.9	3.0	3.1	3.1	3.2	1.5
Water resources projects .....	2.3	2.4	2.1	2.2	2.3	2.3	2.4	2.4	2.5	2.6	2.6	2.7
Space and communications facilities .....	3.1	4.6	3.7	4.1	2.3	2.2	3.9	4.0	4.1	4.2	4.3	4.5
Energy programs .....	2.1	1.6	1.5	1.5	1.5	1.5	1.6	1.7	1.6	1.7	1.7	1.7
Community development programs .....	5.3	5.8	5.4	5.6	5.4	5.5	5.6	5.8	5.9	6.1	6.2	6.4
Other nondefense .....	5.4	5.8	1.6	5.9	6.1	6.1	6.3	6.5	6.7	6.9	7.1	6.0
Subtotal, other nondefense .....	21.1	22.7	16.3	21.5	20.2	20.6	22.6	23.4	23.9	24.6	25.2	22.8
Subtotal, nondefense .....	60.9	62.2	54.3	59.9	59.1	59.9	62.5	63.8	65.2	66.8	68.5	67.2
National defense .....	55.0	50.7	48.5	49.9	51.2	52.1	52.7	54.3	54.7	56.1	57.6	59.1
<b>Total .....</b>	<b>115.9</b>	<b>112.8</b>	<b>102.8</b>	<b>109.8</b>	<b>110.3</b>	<b>112.0</b>	<b>115.2</b>	<b>118.1</b>	<b>119.9</b>	<b>123.0</b>	<b>126.1</b>	<b>126.3</b>

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

Table 6-15 shows current services projections on a constant dollar basis, using fiscal year 1992 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 6-15. CURRENT SERVICES OUTLAY PROJECTIONS FOR FEDERAL PHYSICAL CAPITAL SPENDING**

(In billions of constant 1992 dollars)

	1996 actual	Estimate					2002
		1997	1998	1999	2000	2001	
Nondefense:							
Transportation-related categories:							
Roadways and bridges .....	18.1	17.6	17.4	17.1	16.8	16.5	16.4
Airports and airway facilities .....	4.0	3.3	3.1	3.1	3.0	3.0	3.1
Mass transportation systems .....	3.4	3.5	2.6	2.9	2.8	3.0	2.9
Railroads .....	0.6	0.5	0.6	0.7	0.5	0.5	0.5
Subtotal, transportation .....	26.1	24.9	23.7	23.7	23.2	23.1	23.0
Housing and buildings categories:							
Federally assisted housing .....	6.3	6.5	5.8	5.3	5.1	5.0	4.9
Hospitals .....	1.8	1.6	1.5	1.4	1.4	1.4	1.5
Public buildings <sup>1</sup> .....	3.0	3.0	2.7	2.8	3.0	2.8	2.6
Subtotal, housing and buildings .....	11.1	11.1	10.0	9.5	9.5	9.2	8.9
Other nondefense categories:							
Wastewater treatment and related facilities .....	2.6	2.3	1.8	2.0	2.2	2.4	2.3
Water resources projects .....	2.2	2.3	1.9	2.0	2.0	2.0	2.0
Space and communications facilities .....	3.0	4.3	3.4	3.7	2.0	1.9	3.2
Energy programs .....	2.1	1.5	1.4	1.3	1.3	1.3	1.3
Community development programs .....	4.9	5.2	4.7	4.8	4.5	4.5	4.5
Other nondefense .....	5.2	5.4	1.4	5.3	5.3	5.2	5.2
Subtotal, other nondefense .....	20.1	21.0	14.6	19.0	17.4	17.2	18.5
Subtotal, nondefense .....	57.2	57.0	48.3	52.2	50.1	49.5	50.4
National defense .....	50.0	45.0	42.0	42.1	42.1	41.7	41.2
<b>Total .....</b>	<b>107.3</b>	<b>101.9</b>	<b>90.3</b>	<b>94.3</b>	<b>92.2</b>	<b>91.3</b>	<b>91.5</b>

<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 remaining needs of sewage treatment facilities .....	\$127.1 billion (1992 dollars)
2. Total Federal expenditures under the Clean Water Act of 1972 through 1996 .....	\$67 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 (1996) .....	44.6 percent
2. Average length of stay, IHS hospitals (days) (1996) .....	4.2
3. Hospital admissions (1995) .....	56,796
4. Outpatient visits (1995) .....	4,156,146
5. Population (1997) .....	1,434,529

### 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

Water resources projects include navigation (deepwater ports and inland waterways); flood and storm damage protection; irrigation; hydro-power; 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 set of eligible projects includes those that pass a cost-effectiveness test.

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