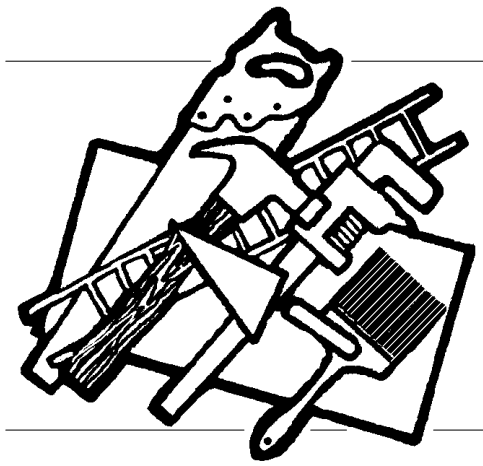


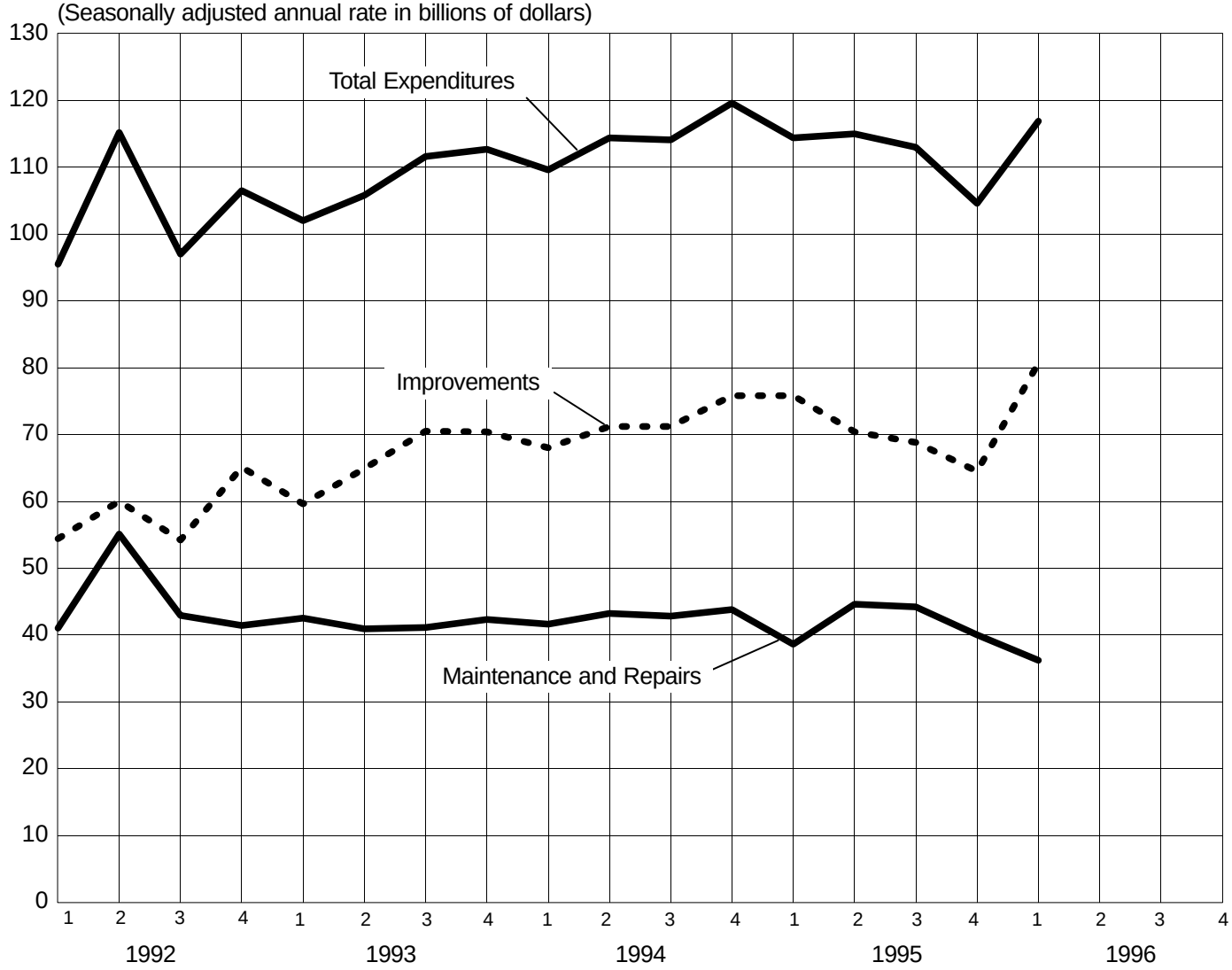
Expenditures for Residential Improvements and Repairs

FIRST QUARTER 1996

C50/96-Q1
Issued February 1997

Quarterly Expenditures for Residential Improvements and Repairs

(Seasonally adjusted annual rate in billions of dollars)



Source: U.S. Bureau of the Census: Expenditures for Residential Improvements and Repairs.

U.S. Department of Commerce
Economics and Statistics Administration
BUREAU OF THE CENSUS

Questions regarding these data may be directed to George A. Roff, Jr., Manufacturing and Construction Division, Telephone 301-457-1605.

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INTRODUCTION

This report provides estimates of expenditures by property owners for construction improvements (additions, alterations, and major replacements) and maintenance and repairs to residential properties.

Table 1 presents quarterly expenditures for all properties at a seasonally adjusted annual rate in current dollars for 1988 to 1996. Table 2 shows actual (not seasonally adjusted) quarterly estimates separately by type of property (all owner-occupied, owner-occupied one-unit, and rental) for 1993 to 1996. Tables 3, 4, and 5 present actual quarterly expenditures for owner-occupied one-unit properties by region (table 3), year structure was built (table 4), and for payment to contractors or for materials purchased (table 5) for 1995 and 1996. Please note that all dollar values shown in this report are in current dollars.

Data for this report were collected by direct interview and by mail from a sample of owners of residential properties. General information about the survey including definitions, survey methodology, and reliability of the data appears in appendixes A and B. Appendix C includes a description of the adjustments for seasonal variation.

SUMMARY

Expenditures made by residential property owners for construction improvements and repairs during the first quarter 1996 were estimated at a seasonally adjusted annual rate of $116.9 billion. Spending on improvements was at a seasonally adjusted rate of $80.7 billion during the first quarter and expenditures for repairs amounted to $36.2 billion.

Actual expenditures for improvements and repairs to all properties amounted to an estimated $21.9 billion during the first quarter 1996. Of this amount, owners of all owner-occupied properties spent $15.0 billion and owners of rental, vacant, and seasonal properties spent $7.0 billion.

Table 1. **Expenditures for Residential Properties: Quarterly 1988 to 1996**

Seasonally Adjusted Annual Rate

[Millions of dollars. Components may not add to totals because of rounding]

Year and quarter	Total expenditures	Maintenance and repairs	Improvements		
			Total	Additions and alterations	Major replacements
1988					
1st quarter	92,000	42,700	49,300	33,700	15,600
2nd quarter	111,800	42,600	69,200	49,400	19,900
3rd quarter	102,100	42,300	59,800	44,100	15,700
4th quarter	95,900	35,900	60,000	43,300	16,700
1989					
1st quarter	96,800	38,200	58,600	42,100	16,500
2nd quarter	97,000	39,100	58,000	38,700	19,300
3rd quarter	104,000	45,500	58,500	39,800	18,700
4th quarter	104,500	46,600	57,900	39,200	18,700
1990					
1st quarter	110,400	48,200	62,200	41,000	21,300
2nd quarter	107,600	52,400	55,300	37,100	18,100
3rd quarter	103,600	50,400	53,200	36,200	17,000
4th quarter	107,100	53,700	53,400	35,900	17,400
1991					
1st quarter	93,700	52,600	41,100	24,700	16,400
2nd quarter	95,500	48,200	47,200	35,500	11,700
3rd quarter	100,300	48,800	51,600	31,600	20,000
4th quarter	97,800	50,300	47,600	30,000	17,600
1992					
1st quarter	95,500	41,000	54,400	38,100	16,400
2nd quarter	115,200	55,100	60,000	40,000	20,000
3rd quarter	97,000	42,900	54,200	36,900	17,300
4th quarter	106,500	41,400	65,100	46,000	19,100
1993					
1st quarter	102,000	42,500	59,600	39,200	20,400
2nd quarter	105,800	40,900	64,900	41,400	23,500
3rd quarter	111,600	41,100	70,500	50,800	19,700
4th quarter	112,700	42,300	70,400	50,800	19,600
1994					
1st quarter	109,600	41,600	68,000	49,900	18,100
2nd quarter	114,400	43,200	71,200	50,700	20,600
3rd quarter	114,100	42,800	71,200	47,600	23,600
4th quarter	119,600	43,800	75,800	47,400	28,500
1995					
1st quarter	114,400	38,600	75,800	50,100	25,700
2nd quarter	115,000	44,600	70,400	46,800	23,600
3rd quarter	113,000	44,200	68,800	41,700	27,100
4th quarter	104,600	40,000	64,500	41,200	23,300
1996					
1st quarter[r]	116,900	36,200	80,700	48,300	32,400

[r]Revised.

Table 2. **Expenditures for Residential Properties by Property Type: Quarterly 1993 to 1996**

Not Seasonally Adjusted

[Millions of dollars. Components may not add to totals because of rounding]

Property type, year, and quarter	Total expenditures	Maintenance and repairs	Improvements					
			Total	Additions and alterations				Major replacements
				Total	To structures		To property outside of structures	
					Additions	Alterations		
ALL PROPERTIES								
Annual								
1993	108,304	41,699	66,606	45,797	12,757	24,782	8,259	20,809
1994	115,030	42,953	72,077	48,828	9,647	28,673	10,509	23,248
1995	111,683	42,047	69,636	44,726	7,936	26,893	9,897	24,910
Relative standard error of annual estimates .....(percent). .	3	2	4	5	13	7	12	8
Quarterly								
1993: 1st quarter	19,709	8,840	10,869	7,719	1,277	5,510	931	3,150
2nd quarter	28,422	10,193	18,229	11,863	3,848	5,248	2,767	6,366
3rd quarter	31,528	11,412	20,115	14,167	3,972	7,036	3,158	5,948
4th quarter	28,645	11,253	17,392	12,048	3,659	6,987	1,402	5,344
1994: 1st quarter	21,191	8,564	12,627	9,900	2,725	5,554	1,621	2,727
2nd quarter	30,988	10,811	20,177	14,518	3,158	7,350	4,009	5,659
3rd quarter	32,297	11,890	20,407	13,240	2,344	7,946	2,949	7,167
4th quarter	30,553	11,688	18,866	11,171	1,419	7,823	1,929	7,695
1995: 1st quarter	21,777	7,877	13,900	10,032	1,049	7,435	1,549	3,868
2nd quarter	31,139	11,213	19,927	13,399	3,223	7,621	2,554	6,528
3rd quarter	32,054	12,269	19,784	11,576	2,644	5,853	3,078	8,208
4th quarter	26,713	10,688	16,025	9,719	1,020	5,983	2,716	6,306
1996: 1st quarter[r]	21,920	7,353	14,567	9,694	1,857	6,295	1,542	4,874
Relative standard error of current quarter estimates . . .(percent). .	4	8	7	10	27	13	24	15
ALL OWNER-OCCUPIED PROPERTIES								
Annual								
1993	72,882	22,133	50,749	36,549	11,519	18,514	6,516	14,200
1994	81,737	25,175	56,562	40,693	8,793	22,996	8,904	15,869
1995	78,583	26,262	52,321	33,972	6,576	19,176	8,221	18,348
Relative standard error of annual estimates .....(percent). .	5	6	6	7	16	8	13	9
Quarterly								
1993: 1st quarter	12,197	3,430	8,767	6,412	1,191	4,422	799	2,355
2nd quarter	19,330	5,841	13,489	9,446	3,040	4,072	2,334	4,043
3rd quarter	22,140	6,915	15,225	11,403	3,796	5,203	2,404	3,822
4th quarter	19,216	5,948	13,268	9,288	3,492	4,817	979	3,980
1994: 1st quarter	14,262	4,326	9,936	8,142	2,437	4,277	1,429	1,794
2nd quarter	23,342	6,553	16,789	12,878	2,962	6,472	3,444	3,912
3rd quarter	22,809	7,380	15,429	10,629	2,206	5,923	2,500	4,800
4th quarter	21,323	6,915	14,408	9,045	1,189	6,325	1,531	5,363
1995: 1st quarter	14,657	4,600	10,057	6,848	517	5,149	1,183	3,208
2nd quarter	23,799	7,932	15,867	10,573	2,904	5,521	2,148	5,295
3rd quarter	21,597	6,768	14,829	9,292	2,325	4,120	2,847	5,537
4th quarter	18,530	6,962	11,568	7,259	829	4,387	2,043	4,309
1996: 1st quarter[r]	14,965	3,529	11,435	7,689	1,701	4,641	1,347	3,746
Relative standard error of current quarter estimates . .(percent) . .	9	10	10	13	30	16	28	17

See footnotes at end of table.

Table 2. **Expenditures for Residential Properties by Property Type: Quarterly 1993 to 1996**—Con.

Not Seasonally Adjusted

[Millions of dollars. Components may not add to totals because of rounding]

Property type, year, and quarter	Total expenditures	Maintenance and repairs	Improvements					
			Total	Additions and alterations				
				Total	To structures		To property outside of structures	Major replacements
					Additions	Alterations		
OWNER-OCCUPIED ONE-UNIT PROPERTIES								
Annual								
1993	70,746	21,175	49,571	35,798	11,501	17,828	6,469	13,773
1994	77,270	24,241	53,030	37,946	8,360	21,527	8,059	15,084
1995	75,362	25,076	50,286	32,538	6,507	17,934	8,097	17,748
Relative standard error of annual estimates .....(percent). .	5	6	6	7	15	9	13	9
Quarterly								
1993: 1st quarter	11,912	3,287	8,625	6,298	1,191	4,308	799	2,327
2nd quarter	18,803	5,595	13,208	9,298	3,029	3,966	2,303	3,910
3rd quarter	21,555	6,664	14,892	11,126	3,789	4,944	2,393	3,765
4th quarter	18,476	5,629	12,847	9,076	3,492	4,610	974	3,771
1994: 1st quarter	13,693	4,138	9,555	7,778	2,321	4,086	1,371	1,777
2nd quarter	21,212	6,240	14,973	11,237	2,648	5,816	2,772	3,736
3rd quarter	21,690	7,109	14,582	10,118	2,206	5,462	2,450	4,464
4th quarter	20,675	6,755	13,920	8,814	1,184	6,164	1,466	5,106
1995: 1st quarter	14,110	4,524	9,585	6,684	517	5,062	1,105	2,901
2nd quarter	23,046	7,580	15,466	10,313	2,869	5,311	2,132	5,154
3rd quarter	20,393	6,499	13,894	8,446	2,291	3,317	2,837	5,448
4th quarter	17,814	6,474	11,340	7,095	829	4,243	2,023	4,245
1996: 1st quarter[r]	14,612	3,325	11,287	7,594	1,701	4,564	1,328	3,693
Relative standard error of current quarter estimates . . .(percent). .	9	10	11	13	30	16	28	17
RENTAL PROPERTIES[1]								
Annual								
1993	35,423	19,566	15,857	9,248	1,238	6,268	1,742	6,609
1994	33,293	17,778	15,515	8,135	854	5,676	1,605	7,380
1994	33,100	15,785	17,315	10,754	1,361	7,717	1,676	6,562
Relative standard error of annual estimates .....(percent). .	4	5	6	11	28	16	24	14
Quarterly								
1993: 1st quarter	7,512	5,410	2,102	1,307	*86	*1,088	*132	795
2nd quarter	9,093	4,352	4,740	2,418	*808	*1,176	*433	2,323
3rd quarter	9,388	4,498	4,890	2,764	*177	*1,833	*754	2,127
4th quarter	9,430	5,306	4,124	2,760	*167	*2,170	*423	1,364
1994: 1st quarter	6,929	4,238	2,691	1,758	*289	*1,277	*193	933
2nd quarter	7,646	4,258	3,388	1,640	*197	*879	*565	1,748
3rd quarter	9,489	4,510	4,979	2,611	*139	*2,023	*449	2,368
4th quarter	9,230	4,772	4,458	2,126	*230	*1,498	*398	2,332
1995: 1st quarter	7,120	3,277	3,844	3,184	*532	*2,286	*366	659
2nd quarter	7,340	3,281	4,059	2,826	*319	*2,101	*407	1,233
3rd quarter	10,457	5,502	4,955	2,284	*319	*1,733	*231	2,671
4th quarter	8,183	3,726	4,457	2,459	*191	*1,596	*673	1,998
1996: 1st quarter	6,956	3,824	3,132	2,004	*155	*1,655	*194	1,128
Relative standard error of current quarter estimates . .(percent). .	14	18	22	31	51	36	47	32

*These estimates are subject to high sampling errors. Caution should be used in estimating quarterly differences. [r]Revised.

[1]Includes rental, vacant, and seasonal properties.

Note: Quarterly relative standard errors are derived from an average of the most recent 4 quarters. Annual standard errors are derived from an average of the most recent 3 years.

Table 3. **Expenditures for Owner-Occupied One-Unit Properties by Region: Quarterly 1995 to 1996**

Not Seasonally Adjusted

[Millions of dollars. Components may not add to totals because of rounding]

Year and quarter	United States	Region			
		Northeast	Midwest	South	West
TOTAL EXPENDITURES					
1995: Total	**75,362**	**15,319**	**20,769**	**24,135**	**15,139**
1st quarter	14,110	2,815	3,052	5,424	2,819
2nd quarter	23,046	4,367	6,778	7,515	4,387
3rd quarter	20,393	5,310	5,793	5,501	3,788
4th quarter	17,814	2,827	5,146	5,695	4,145
1996: 1st quarter	14,612	2,408	3,584	5,232	3,388
Relative standard error estimates (percent):					
Annual	5	8	8	11	12
Quarter	9	12	15	16	22
MAINTENANCE AND REPAIRS					
1995: Total	**25,076**	**5,021**	**5,536**	**9,275**	**5,245**
1st quarter	4,524	482	991	2,102	950
2nd quarter	7,580	1,635	1,496	3,092	1,358
3rd quarter	6,499	1,389	1,566	2,028	1,516
4th quarter	6,474	1,515	1,483	2,054	1,422
1996: 1st quarter	3,325	600	685	1,180	860
Relative standard error estimates (percent):					
Annual	6	13	12	12	10
Quarter	10	22	18	16	24
TOTAL IMPROVEMENTS					
1995: Total	**50,286**	**10,298**	**15,233**	**14,860**	**9,895**
1st quarter	9,585	2,333	2,061	3,322	1,869
2nd quarter	15,466	2,732	5,282	4,423	3,029
3rd quarter	13,894	3,921	4,227	3,473	2,273
4th quarter	11,340	1,312	3,663	3,642	2,724
1996: 1st quarter	11,287	1,808	2,899	4,052	2,528
Relative standard error estimates (percent):					
Annual	6	9	10	13	14
Quarter	11	18	19	22	26

Note: Quarterly relative standard errors are derived from an average of the most recent 4 quarters. Annual standard errors are derived from an average of the most recent 3 years.

Table 4. **Expenditures for Owner-Occupied One-Unit Properties by Year Built: Quarterly 1995 to 1996**

Not Seasonally Adjusted

[Millions of dollars. Components may not add to totals because of rounding]

Year and quarter	All years	Year built					
		1990 to 1996	1980 to 1989	1970 to 1979	1960 to 1969	Before 1960	Not reported
TOTAL EXPENDITURES							
1995: Total	**75,362**	**5,077**	**10,225**	**15,637**	**10,759**	**27,796**	**5,868**
1st quarter	14,110	1,047	2,749	3,547	2,190	3,954	623
2nd quarter	23,046	1,814	2,505	4,428	3,399	8,427	2,472
3rd quarter	20,393	1,298	2,634	4,240	2,569	8,589	1,063
4th quarter	17,814	918	2,337	3,421	2,601	6,826	1,710
1996: 1st quarter	14,612	1,859	2,520	2,576	2,013	4,942	701
Relative standard error estimates (percent):							
Annual	5	16	11	12	14	7	14
Quarter	9	30	18	17	24	14	30
MAINTENANCE AND REPAIRS							
1995: Total	**25,076**	**1,740**	**3,973**	**4,379**	**3,984**	**9,469**	**1,532**
1st quarter	4,524	450	788	934	1,033	1,051	268
2nd quarter	7,580	627	964	986	968	3,303	732
3rd quarter	6,499	186	1,084	1,035	961	3,016	217
4th quarter	6,474	477	1,137	1,425	1,023	2,098	314
1996: 1st quarter	3,325	645	496	509	395	1,091	189
Relative standard error estimates (percent):							
Annual	6	23	14	14	16	9	21
Quarter	10	38	23	21	20	16	32
TOTAL IMPROVEMENTS							
1995: Total	**50,286**	**3,338**	**6,252**	**11,258**	**6,775**	**18,327**	**4,336**
1st quarter	9,585	597	1,961	2,613	1,157	2,903	355
2nd quarter	15,466	1,188	1,541	3,443	2,431	5,124	1,740
3rd quarter	13,894	1,112	1,550	3,206	1,609	5,572	846
4th quarter	11,340	441	1,200	1,997	1,578	4,728	1,396
1996: 1st quarter	11,287	1,214	2,025	2,067	1,618	3,852	512
Relative standard error estimates (percent):							
Annual	6	20	15	14	17	9	18
Quarter	11	40	24	21	32	18	36

Note: Quarterly relative standard errors are derived from an average of the most recent 4 quarters. Annual standard errors are derived from an average of the most recent 3 years.

Table 5. **Expenditures for Owner-Occupied One-Unit Properties by Payments to Contractors or Materials Purchased by Owner: Quarterly 1995 to 1996**

Not Seasonally Adjusted

[Millions of dollars. Components may not add to totals because of rounding]

Year and quarter	All payments	Total payments to contractors or hired labor[1]	Payments for building materials purchased by owner—		
			Total	For jobs done by owner[2]	For jobs done under contract
TOTAL EXPENDITURES					
1995: Total	**75,362**	**59,676**	**15,687**	**12,270**	**3,417**
1st quarter	14,110	11,006	3,104	2,547	557
2nd quarter	23,046	17,877	5,170	3,939	1,231
3rd quarter	20,393	16,096	4,297	3,128	1,169
4th quarter	17,814	14,697	3,117	2,657	460
1996: 1st quarter	14,612	11,288	3,325	3,008	317
Relative standard error estimates (percent):					
Annual	5	6	7	8	20
Quarter	9	10	12	12	27
MAINTENANCE AND REPAIRS					
1995: Total	**25,076**	**19,228**	**5,848**	**5,353**	**496**
1st quarter	4,524	3,485	1,039	966	73
2nd quarter	7,580	5,686	1,893	1,815	79
3rd quarter	6,499	4,889	1,609	1,475	135
4th quarter	6,474	5,167	1,306	1,097	209
1996: 1st quarter	3,325	2,282	1,043	940	103
Relative standard error estimates (percent):					
Annual	6	7	10	10	25
Quarter	10	13	14	15	37
TOTAL IMPROVEMENTS					
1995: Total	**50,286**	**40,446**	**9,839**	**6,918**	**2,921**
1st quarter	9,585	7,520	2,065	1,581	484
2nd quarter	15,466	12,190	3,276	2,124	1,152
3rd quarter	13,894	11,207	2,687	1,653	1,034
4th quarter	11,340	9,529	1,811	1,559	251
1996: 1st quarter	11,287	9,006	2,281	2,067	214
Relative standard error estimates (percent):					
Annual	6	7	9	9	24
Quarter	11	39	16	16	34

[1]Includes building materials supplied by the contractor or hired labor.
[2]Includes building materials purchased to have on hand.

Note: Quarterly relative standard errors are derived from an average of the most recent 4 quarters. Annual standard errors are derived from an average of the most recent 3 years.

Appendix A.
Definitions and Explanations

PROPERTIES INCLUDED IN THIS REPORT

This report presents improvement and repair expenditures by property owners for residential properties in the 50 States and the District of Columbia with the exceptions noted below. These data cover single and multiunit structures, publicly and privately owned structures, nonfarm and farm properties, and residential properties which are occupied by owners or renters or are vacant.

Information on properties classified as primarily nonresidential is excluded even though such properties may contain some residential space. Residential properties are defined as those having half or more of the enclosed space devoted to nontransient residential use. Also excluded are residential structures on the grounds of institutions, schools, convents, Armed Forces installations, etc.; hotels, motels, tourist cabins, mobile homes, and boarding houses; and unusual living quarters, such as tents, boats, etc.

Expenditures made by renters are not included in this report. A study of renters' expenditures in 1989 showed that they accounted for less than 1 percent of all expenditures for improvements and repairs.

EXPENDITURES INCLUDED IN THIS REPORT

The expenditures covered in this report are those connected with construction activity intended to maintain or improve the property. The expenditures involve expenses for maintenance and repairs, additions, alterations, and major replacements which are made on the property by the owners. Included are all costs, for both the inside and outside of the house, whether on the main dwelling, on other structures on the property incidental to the residential use of the main dwellings, or for the grounds on which the structures are erected.

As a general principle, expenses connected with items not permanently attached or firmly affixed to some part of the house or property are not included in the report. Thus, expenses connected with the repair or replacement of household appliances, such as stoves, refrigerators, television sets, room air-conditioners, etc., are excluded, as are costs connected with house furnishings such as furniture, rugs, and draperies. While the cost of appliances is excluded, the construction cost of building-in such appliances (e.g., the cost of building-in a wall oven) is included in the scope of this report. Everyday household and housekeeping expenses such as waxing floors and furniture, cleaning walls and windows, etc., are not within the scope of this report. Expenditures for grading, draining, fencing, and paving are included, but costs of landscaping (i.e., planting of flowers, trees, shrubs, etc.) are not included in this report.

Kinds of Expenditures

Expenditures included in this report cover work done under contract or by hired labor, materials purchased by owners, and the cost of purchasing or renting tools and equipment for purposes of carrying on jobs which fall within the scope of the report. However, no attempt is made to estimate or include the value of labor in do-it-yourself jobs.

Timing of Expenditures

For one-to-four-housing-unit properties with one unit owner-occupied and owner-occupied condominiums, expenditures are reported in the month of payment for labor and materials regardless of when the work was done.

For one-to-four-housing-unit properties with no unit owner occupied and all properties with five housing units or more, expenditures appear in the quarter in which they are found in the owners' or managers' records.

PROPERTY CHARACTERISTICS

Residential Property

A property consists of the land in one ownership unit, all residential structures on this land, and any facilities attached to the land. It includes the house and additional residential structures on the land, and auxiliary nonresidential structures such as a garage or a workshop. For the nonresident owners and owners of properties with five housing units or more, property identification is generally determined by bookkeeping practices. Groups of buildings owned by one person or organization can be classified as one or more properties depending on whether separate expenditure data are kept by the owner.

Housing Unit

In general, a housing unit is a group of rooms or a single room occupied as separate living quarters by a family, a group of unrelated persons living together, or by a person living alone. Vacant living quarters which are intended for occupancy as separate quarters are also housing units. Separate living quarters are defined as

having either (1) direct access from the outside or through a common hall, or (2) a kitchen or cooking equipment for the exclusive use of the occupants.

REGIONS

The standard census geographic regions are used in the tables of this report. States contained in each region are as follows: **Northeast**—Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, Connecticut, New York, Pennsylvania, and New Jersey; **Midwest**—Ohio, Indiana, Illinois, Michigan, Wisconsin, Minnesota, Iowa, Missouri, Kansas, Nebraska, North Dakota, and South Dakota; **South**—Delaware, Maryland, District of Columbia, Virginia, West Virginia, North Carolina, South Carolina, Georgia, Florida, Alabama, Mississippi, Tennessee, Kentucky, Arkansas, Louisiana, Oklahoma, and Texas; **West**—Montana, Wyoming, Colorado, New Mexico, Arizona, Utah, Idaho, Alaska, Washington, Oregon, Nevada, California, and Hawaii.

TYPES OF EXPENDITURES

Expenditures are classified broadly as either maintenance and repairs or construction improvements. Improvements are further classified as additions to residential structures, alterations within residential structures, additions and alterations on property outside residential structures, and major replacements.

In general, when a maintenance or repair job is undertaken as part of a more extensive alteration or construction improvement, the cost of it is reported with the alteration or improvement of which it is a part. For example, repair of a floor as part of remodeling a room is reported with the alteration.

Maintenance and Repairs

Expenditures represent current costs for incidental maintenance and repairs which keep a property in ordinary working condition, rather than additional investment in the property.

Maintenance includes expenses for painting, papering, floor sanding, furnace cleaning or adjustment, etc. Repairs include many kinds of expenditures for plumbing, heating, electrical work, and other kinds of activity involved in the upkeep of residential properties. Repairs also include replacements of parts and of whole units except for a select list specified below as major replacement expenditures. For example, roof repairs (including replacement of shingles, gutters, etc.) are classified under maintenance and repairs, but a complete reroofing is classified as a major replacement. Plumbing repairs may include extensive replacement of water pipes, but if the entire piping system is removed and a new one put in, the expenditures for the work are classified as major replacements.

Maintenance and repairs do not include expenses for trash and snow removal, lawn maintenance and landscaping, or cleaning and janitorial services.

Construction Improvements

Expenditures for construction improvements are capital expenditures which add to the value or useful life of a property. Since the classification is based on the concept of additions, alterations, and major replacements rather than dollar value, some very small expenditures which may not be considered capital investments are included among the improvements, such as installing a new electrical socket or garbage disposal. Construction improvements as noted above cover additions to residential structures, alterations within residential structures, additions and alterations on properties outside residential structures, and major replacements.

Additions to residential structures. These refer to the actual enlargement of the structure either by adding a wing, room, porch, attached garage, shed, or a carport, or by raising the roof, or digging a basement.

Alterations within residential structures. These include changes or improvements made within or on the structure. The changes or improvements range from a complete restructuring, which involves removal of the entire interior of the structure and remodeling it, to the installation of a new electric service outlet, wall switch, or new shelves.

Additions and alterations on property outside residential structures. These include laying or improving walks or driveways; building walls or fences; creating or improving recreational facilities such as swimming pools, tennis courts, barbecue fireplaces; constructing detached garages, sheds, patios, green houses, or the improvement of these by the installation of electricity, drains or new storage facilities. Grading and filling are included, but not landscaping.

Major replacements. The following is a list of relatively expensive items that, when replaced, are considered to be construction improvements as opposed to repairs:

Complete furnace or boiler
Entire roof
Central air-conditioner
All siding
Water heater
Entire electrical wiring
Doors
Plumbing fixtures
All water pipes
Windows
Septic tank or cesspool
Sink or laundry tub
Complete walks or drive ways
Garbage disposal unit

In general, the distinction between major replacements and additions and alterations is that major replacements are not innovations. Installation of a bathtub where there had not been one before is an alteration, but the substitution of a new bathtub for an old one is a major replacement.

Appendix B.
Survey Methods and Reliability of Data

INTRODUCTION

This appendix describes the data sources, sample design, and estimation procedures used to develop quarterly estimates of expenditures for the improvement and repairs to residential properties. This description refers to the revised survey methods effective with first quarter 1984 data. A description of the earlier methods appears in Construction Reports C50-84-A, issued April 1985.

SOURCES OF DATA

The data presented in this report are compiled from two sources:

1. Household survey of a sample of consumer units, and
2. Mail survey of owners of a sample of rental or vacant properties.

Household Survey

Description of survey. Data based on personal interviews are obtained from household members as part of the Consumer Expenditure (CE) Surveys conducted by the Bureau of the Census for the Bureau of Labor Statistics (BLS). The CE survey is designed to collect data on major items of consumer expense, household characteristics, and income. The expenditures covered by the survey are those which respondents can be expected to recall fairly accurately for 3 months or longer, including expenditures for maintenance and repairs and improvement of properties. Each sample household is interviewed once per quarter for five consecutive quarters.

For the initial interview, information is collected on demographic and family characteristics and on the inventory of major durable goods of each consumer unit. Construction expenditure information is also collected in this interview, using a 1-month recall, and is used solely for bounding purposes: that is, to prevent the reporting of expenditures outside the reference period in subsequent interviews.

The second through fifth interviews use uniform questionnaires to collect expenditures for the previous months and the current month to date. Six months of data collection are required to account for all the expenditures for a quarter.

Households which move from their sample address between interviews are dropped from the survey. New households which move into the sample address are screened for eligibility and included in the survey if found qualified.

Sample design. The sample for the CE survey is a national probability sample of households designed to be representative of the urban U.S. civilian population. The eligible population is composed of all civilian noninstitutional persons.

The first step in sampling was the selection of primary sampling units (PSU's) which consist of counties (or parts thereof), groups of counties, or independent cities. The set of sample PSU's used for the survey is composed of 101 areas. The PSU's in this part of the design represent only the metropolitan and urban nonmetropolitan parts of the United States and are classified according to the following four categories: ''A'' PSU's, which comprise 29 self-representing areas, are large metropolitan statistical areas with nonfarm population greater than 1.2 million plus the Anchorage and Honolulu MSA's; 20 ''L'' PSU's defined as medium-size metropolitan areas; 24 ''M'' PSU's defined as small metropolitan areas; and 12 ''R'' PSU's defined as urban places in nonmetropolitan areas. The population break between ''L'' and ''M'' PSU's is different in each of the regions and varies from 330,000 in the West to 500,000 in the Northeast. Since these PSU's do not represent the nonmetropolitan rural population, it was necessary to supplement this design with 16 additional PSU's, denoted as ''T'' PSU's, to represent this population. The ''L,'' ''M,'' and ''R'' PSU's were selected using a controlled selection procedure to insure a distribution across States and other stratifying characteristics.

The sampling frame (the list from which housing units were chosen) for this survey was generated from the 1990 census 100-percent detail file, augmented by new construction permits, and an area sample frame to represent all areas which do not have good 1990 census addresses, which are in nonpermit areas, and which have permit office problems.

The sample design is a rotating panel survey. Each rotation comprises one-fourth of a sample and is interviewed for five consecutive quarters. In each quarter, the housing units in five rotations are interviewed but the rotation which is being interviewed for the first time is used solely to bound the data to be collected in the four

subsequent quarters. Allowing for the bounding interviews and for nonresponse (including vacancies), the number of usable interviews per quarter is targeted at 3,700.

Estimation and data adjustment procedures. Estimates of expenditures for improvements and repairs are tabulated from responses to the CE questionnaire (CE-302), Section 5, ''Construction Repairs, Alterations, and Maintenance of Property,'' and Section 7, ''Service Contracts,'' by owner occupants of one- to four-unit properties and condominiums. Each sample household included in the survey represents a given number of households in the United States. The sum of the weighted sample households is the estimate of total households in the United States or the universe. The translation of sample households into the universe of households is known as weighting.

There are six basic steps in determining the weight for each interviewed household:

1. The basic weight assigned to a household is the inverse of the probability of selection of the housing unit containing the household.
2. A weight control factor is given to each household for which subsampling was performed in the field.
3. A noninterview adjustment is made for housing units selected from the permit frame for which the addresses were no longer available at the permit office.
4. A noninterview adjustment is made for interviews which could not be collected from occupied housing units because of refusals or because no one was home (type A). The adjustment is performed as a function of region, tenure, family size, and race.
5. A ratio adjustment is made at the national level to adjust the age, sex, and race levels from the survey to independently derived controls.
6. A final weight adjustment is made to account for the composition of the households.

Mail Survey

Description of the survey. Nonresident owners of rental or vacant properties with one to four housing units and owners of rental or vacant properties containing five housing units or more, as identified in the CE household survey, are mailed a questionnaire to report detailed maintenance and repairs and improvement expenditures for their entire property. Approximately 2,000 owners are queried each quarter.

All mail questionnaires, including those from the initial mailing, are used in the tabulation of data for this report. This is based on an assumption that owners of rental properties keep detailed records of their expenditures for improvements and repairs and that the reports would be based on such records rather than on memory alone.

Sample design. The mail survey consists of owners of the properties identified in the household survey as being one to four unit properties with no resident owner and all properties (excluding owner occupied condominiums) with five housing units or more. A result of this method of sampling is that the probability of selection of a property is proportionate to the number of housing units in the property.

Estimation and data adjustment procedures. The data collected on form SORAR-705 are adjusted for unreturned or unusable forms by region and MSA status. The weights are adjusted so that sample counts of renter occupied and vacant housing units agree with independently derived controls from the Current Population Survey.

RELIABILITY OF DATA

The statistics in this report are based on sample surveys and may differ from statistics which would have been obtained from a complete census using the same forms and procedures. An estimate based on a sample survey is subject to both sampling error and nonsampling error. The accuracy of a survey result is determined by the joint effect of these errors.

Measures of sampling errors. Sampling error reflects the fact that only a particular sample was surveyed rather than the entire population. The sample selected for the CE survey is one of a large number of similar probability samples that, by chance, might have been selected under the same specifications. Estimates derived from the different samples would differ from each other. The standard error, or sampling error, of a survey estimate is a measure of the variation among the estimates from all possible samples and, thus, is a measure of the precision with which an estimate from a particular sample approximates the average from all possible samples.

Estimates of standard errors have been computed from the sample data for statistics in this report. They are presented in the tables in the form of relative standard errors. The relative standard error equals the standard error divided by the estimated value to which it refers.

The sample estimate and an estimate of its standard error allow us to construct interval estimates with prescribed confidence that the interval includes the average result of all possible samples with the same size and design. A 90-percent confidence interval is defined to be from 1.6 standard errors below the estimate to 1.6

standard errors above the estimate. If all possible samples were selected and surveyed under essentially the same conditions and all the respective 90-percent confidence intervals were generated, then approximately nine-tenths of the intervals would include the average value of all sample estimates and approximately one-tenth would not include this estimate. For example, this report shows that residential property owners spent $21.9 billion for improvements and repairs in the first quarter 1996 and that the average relative standard error of this estimate is 4 percent. Multiplying $21.9 billion by .04, we obtain $0.9 billion as the standard error. To obtain a 90-percent confidence interval, multiply $0.9 billion by 1.6, yielding limits of $20.5 billion and $23.3 billion ($21.9 billion plus or minus $1.4 billion). The average estimate for the specified quarter may or may not be contained in this computed interval, but one can say that the average estimate from all possible samples is included in the constructed interval with a specified confidence of 90 percent.

The sampling errors of some estimates are too great to allow meaningful comparisons among these estimates. The sampling errors should be regarded as orders of magnitude rather than absolute measurements.

Nonsampling errors and other limitations. As calculated for this report, the estimated relative standard errors measure certain nonsampling errors, but do not measure any systematic biases in the data. Bias is the difference, averaged over all possible samples with the same size and design, between the estimates and the true value being estimated. Nonsampling errors can be attributed to many sources: inability to obtain information about all cases in the sample; definitional difficulties; differences in interpretation of questions; inability or unwillingness of respondents to provide correct information; and errors made in processing the data. These nonsampling errors also occur in complete censuses. Although no direct measurements of the biases have been obtained, it is believed that most of the important response and operational errors were detected in the course of reviewing the data for reasonableness and consistency.

Six potential sources of bias are:

1. Nonresponse to the survey as a result of selecting housing units from the permit frame for which addresses are no longer available at the permit office.
2. Nonresponse resulting from interview refusal or because no one was home.
3. Undercoverage in the sampling frame with respect to demographic and family characteristics of sample consumer units.
4. Memory failure, including failure to remember exact values, and the reporting of information for an earlier or later time period than it actually occurred (telescoping).
5. Problems in classifying the types of jobs performed.
6. Adjustment for extreme values where a weighted value of $300 million or more is contributed by a single job.

Appendix C.
Adjustments for Seasonal Variations

ADJUSTMENTS FOR SEASONAL VARIATIONS

Quarterly estimates of expenditures for improvements and repairs are adjusted to eliminate the effect of changes that normally occur about the same time and in about the same magnitude each year. The seasonally adjusted estimates are converted to annual rates by multiplying by 4. Estimates for expenditures at seasonally adjusted annual rates are shown in table 1.

The factors used for making the adjustment were developed using the X-11 ARIMA version of the Census Method II seasonal adjustment program. A description of the X-11 ARIMA program appears in ''The X-11 ARIMA Seasonal Adjustment Method,'' by Estela Bee Dagum, Statistics Canada.

Table C. **Factors Used to Seasonally Adjust Expenditures for Residential Properties**

Year and quarter	Total expenditures	Maintenance and repairs	Improvements		
			Total	Additions and alterations	Major replacements
1992					
1st quarter	78.2	84.5	73.4	77.0	65.0
2nd quarter	105.7	98.6	112.3	114.6	107.6
3rd quarter	113.7	111.7	115.3	113.1	120.1
4th quarter	101.6	105.6	99.1	95.3	108.2
1993					
1st quarter	77.3	83.2	73.0	78.8	61.9
2nd quarter	107.4	99.7	112.4	114.6	108.5
3rd quarter	113.0	110.9	114.2	111.5	121.0
4th quarter	101.7	106.5	98.8	94.8	109.2
1994					
1st quarter	77.4	82.4	74.3	79.4	60.2
2nd quarter	108.3	100.2	113.3	114.6	110.0
3rd quarter	113.2	111.0	114.6	111.2	121.4
4th quarter	102.2	106.7	99.6	94.4	108.2
1995					
1st quarter	76.1	81.7	73.3	80.1	60.1
2nd quarter	108.3	100.6	113.2	114.4	110.6
3rd quarter	113.2	111.0	115.0	111.0	121.2
4th quarter	102.2	106.8	99.3	94.3	108.2
1996					
1st quarter	75.0	81.4	72.2	80.3	60.1
2nd quarter	(NA)	100.9	(NA)	114.4	110.9
3rd quarter	(NA)	111.0	(NA)	111.0	121.0
4th quarter	(NA)	106.9	(NA)	94.3	108.2

NA Not available.