

# Housing Starts

This issue contains revised seasonally adjusted annual rates for 1997 through 1999 for new privately owned housing units started (see Table 1).

Effective with estimates for January 2000, we have redefined a housing unit. The new definition is:

**A housing unit is a house, an apartment, a group of rooms or a single room intended for occupancy as separate living quarters. Separate living quarters are those in which the occupants live separately from any other individuals in the building and which have a direct access from the outside of the building or through a common hall.**

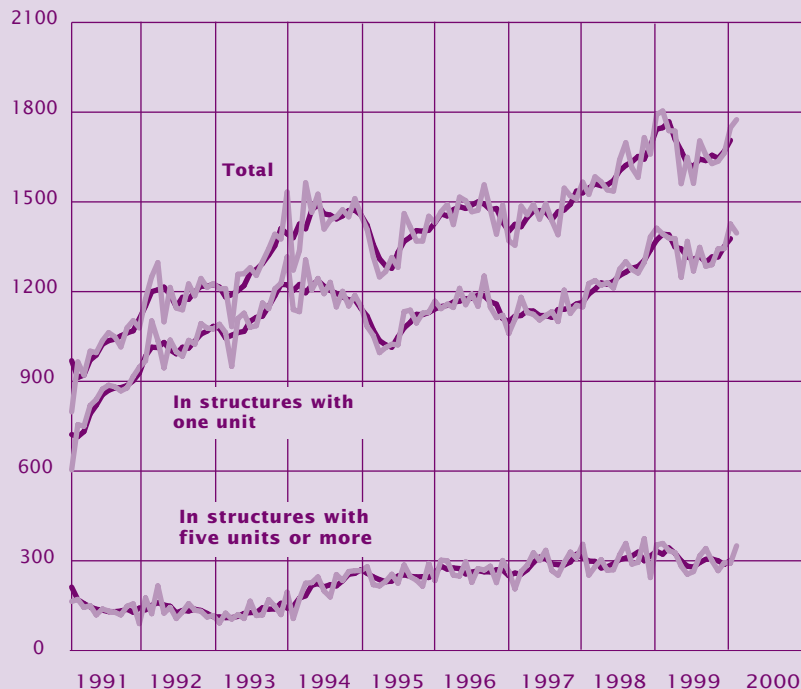
The new definition eliminates the previous requirement that the residents must have the capability to eat separately from those in other units. Based on the old definition some senior housing projects were excluded from our multifamily housing statistics because they did not have their own eating facilities.

The appendix to this report (beginning on page A-1) includes information on survey definitions, sample design, data compilation, seasonal adjustment, and the reliability of the data.

## New Privately Owned Housing Units Started

Seasonally adjusted annual rate in thousands

— Seasonally adjusted annual rate  
— 4-month moving average



Note: Total includes units started in structures with two to four units.  
Source: U.S. Census Bureau, Housing Starts.

Questions regarding these data may be directed to Residential Construction Branch, Manufacturing and Construction Division, telephone: 301-457-1321.

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## HOUSING STARTS AND BUILDING PERMITS

Privately owned housing starts in January 2000 were at a seasonally adjusted annual rate of 1,775,000; this is 2 ( $\pm 6$ ) percent above the revised December rate of 1,748,000 but 2 ( $\pm 7$ ) percent below the January 1999 figure of 1,804,000.

Single-family housing starts in January 2000 were at a rate of 1,396,000; this is 2 ( $\pm 6$ ) percent below the December figure of 1,426,000. The January rate for units in buildings with five units or more was 350,000. The January rate for units in buildings with two to four units was 29,000.

New privately owned housing construction was authorized in January in the 19,000 permit-issuing places at a seasonally adjusted annual rate of 1,763,000 units; this is 9 ( $\pm 1$ ) percent above the revised December rate of 1,622,000, but 1 ( $\pm 1$ ) percent below the January 1999 figure of 1,778,000.

Single-family authorizations in January 2000 were at a rate of 1,303,000; this is 6 ( $\pm 1$ ) percent above the December figure of 1,228,000. Authorizations of units in buildings with five units or more were at a rate of 398,000 in January. The January rate of permit-authorized units in buildings with two to four units was 62,000.

In interpreting changes in housing starts and building permits, note that month-to-month changes in seasonally adjusted statistics often show movements which may be irregular. It may take 5 months to establish an underlying trend for total starts and 3 months for building permit authorizations.

The statistics in this report are estimated from sample surveys and are subject to sampling variability as well as nonsampling error including bias and variance from response, nonreporting, and undercoverage. Estimated average relative standard errors of preliminary data are shown in the tables. Whenever a statement such as "2 ( $\pm 3$ ) percent above" appears in the text, this indicates the range (-1 to +5 percent) in which the actual percent change is likely to have occurred. All ranges given are 90-percent confidence intervals and account for only sampling variability. If a range contains zero, it is uncertain whether there was an increase or decrease; that is, the change is not statistically significant. For any comparison cited without a confidence interval, the change is statistically significant. The appendix to this report includes explanations of confidence intervals and sampling variability. On average, the preliminary seasonally adjusted estimates of total housing starts and building permits are revised about  $\pm 1$  percent.

## HISTORICAL DATA

Historical data on housing starts and residential permit authorizations are available from Residential Construction Branch, Manufacturing and Construction Division, U.S. Census Bureau, Washington, DC 20233-6900, telephone 301-457-1321.

A list of tables and special supplements is shown below:

Title	C20 issues				
New privately owned housing units started, by purpose of construction (quarterly and annual data).....	00-1	99-10	99-7	99-4	99-1
Total time from start of construction to completion of private residential buildings (annual data) .....	99-3	98-3	97-3	96-3	95-3
Total time from authorization of construction to start for private residential buildings (annual data) .....	99-3	98-3	97-3	96-3	95-3
New privately owned housing units, by intended use and design at time of start (annual data) .....	99-2	98-2	97-2	96-2	95-2

**Table 1. New Privately Owned Housing Units Started**

[Thousands of units. Detail may not add to total because of rounding]

Period	Total	In structures with—				Inside MSAs <sup>1</sup>	Outside MSAs <sup>1</sup>	North-east	Midwest	South	West
		1 unit	2 units	3 and 4 units	5 units or more						
<b>ANNUAL DATA</b>											
1990	1,192.7	894.8	16.1	21.4	260.4	946.9	245.7	131.3	253.2	479.3	328.9
1991	1,013.9	840.4	15.5	20.1	137.9	789.2	224.7	112.9	233.0	414.1	254.0
1992	1,199.7	1,029.9	12.4	18.3	139.0	931.5	268.2	126.7	287.8	496.9	288.3
1993	1,287.6	1,125.7	11.1	18.3	132.6	1,031.9	255.8	126.5	297.7	561.8	301.7
1994	1,457.0	1,198.4	14.8	20.2	223.5	1,183.1	273.9	138.2	328.9	639.1	350.8
1995	1,354.1	1,076.2	14.3	19.4	244.1	1,106.4	247.6	117.7	290.1	615.0	331.3
1996	1,476.8	1,160.9	16.4	28.8	270.8	1,211.4	265.5	132.1	321.5	661.9	361.4
1997	1,474.0	1,133.7	18.1	26.4	295.8	1,221.3	252.7	136.8	303.6	670.3	363.3
1998	1,616.9	1,271.4	15.7	26.9	302.9	1,349.9	267.0	148.5	330.5	743.0	394.9
1999 <sup>f</sup>	1,664.8	1,333.4	13.4	18.5	299.5	1,402.7	262.1	153.6	356.6	761.4	393.2
<b>MONTHLY DATA</b>											
<b>Not Seasonally Adjusted</b>											
1999:											
January	108.0	82.1	0.7	2.0	23.3	95.6	12.4	7.9	13.5	57.3	29.2
February	112.2	89.1	0.7	0.8	21.6	97.4	14.8	9.6	16.5	62.1	24.1
March	149.3	122.9	1.4	1.4	23.6	124.9	24.5	12.1	29.2	73.1	34.9
April	146.5	118.8	1.8	1.2	24.8	122.0	24.5	12.1	32.6	64.9	36.9
May	155.6	130.4	1.1	1.1	23.0	131.3	24.3	14.7	35.7	66.9	38.3
June	152.4	127.9	1.2	1.8	21.5	124.9	27.5	16.0	38.1	63.9	34.4
July	155.2	123.4	1.2	2.6	28.0	130.2	25.0	17.3	31.3	66.6	39.9
August	155.0	119.7	1.2	1.6	32.5	131.3	23.7	16.5	33.5	68.0	37.0
September	143.3	112.5	0.9	2.6	27.4	119.1	24.2	12.3	34.5	62.8	33.7
October	145.4	115.8	1.4	1.1	27.0	123.8	21.6	12.3	37.5	64.9	30.7
November <sup>f</sup>	127.9	102.1	0.9	1.2	23.7	105.1	22.7	12.5	30.0	54.5	30.9
December <sup>f</sup>	114.0	88.8	0.9	1.2	23.2	97.2	16.8	10.5	24.0	56.3	23.2
2000:											
January <sup>p</sup>	106.9	81.9	0.9	0.7	23.4	91.6	15.3	8.1	17.5	55.7	25.7
<b>Seasonally Adjusted Annual Rate</b>											
1997: <sup>f</sup>						(NA)	(NA)				
January	1,355	1,108	41		206	(NA)	(NA)	157	249	596	353
February	1,486	1,181	41		264	(NA)	(NA)	127	359	644	356
March	1,457	1,130	42		285	(NA)	(NA)	148	298	642	369
April	1,492	1,124	41		327	(NA)	(NA)	144	290	707	351
May	1,442	1,105	36		301	(NA)	(NA)	122	310	641	369
June	1,494	1,120	39		335	(NA)	(NA)	114	305	711	364
July	1,437	1,133	37		267	(NA)	(NA)	147	300	657	333
August	1,390	1,100	38		252	(NA)	(NA)	119	283	637	351
September	1,546	1,205	47		294	(NA)	(NA)	154	316	716	360
October	1,520	1,127	64		329	(NA)	(NA)	116	324	700	380
November	1,510	1,154	47		309	(NA)	(NA)	171	275	666	398
December	1,566	1,149	62		355	(NA)	(NA)	133	333	707	393
1998: <sup>f</sup>						(NA)	(NA)				
January	1,525	1,227	46		252	(NA)	(NA)	148	345	644	388
February	1,584	1,237	67		280	(NA)	(NA)	190	376	690	328
March	1,567	1,221	42		304	(NA)	(NA)	147	311	712	397
April	1,540	1,230	42		268	(NA)	(NA)	132	340	690	378
May	1,536	1,212	54		270	(NA)	(NA)	147	294	707	388
June	1,641	1,275	46		320	(NA)	(NA)	139	318	772	412
July	1,698	1,300	40		358	(NA)	(NA)	152	312	803	431
August	1,614	1,274	51		289	(NA)	(NA)	132	316	779	387
September	1,582	1,262	25		295	(NA)	(NA)	145	314	713	410
October	1,715	1,298	43		374	(NA)	(NA)	167	355	833	360
November	1,660	1,383	33		244	(NA)	(NA)	142	325	791	402
December	1,792	1,412	27		353	(NA)	(NA)	162	427	763	440
1999: <sup>f</sup>						(NA)	(NA)				
January	1,804	1,393	53		358	(NA)	(NA)	146	328	871	459
February	1,738	1,379	25		334	(NA)	(NA)	194	358	843	343
March	1,737	1,377	33		327	(NA)	(NA)	159	378	810	390
April	1,561	1,248	31		282	(NA)	(NA)	135	337	684	405
May	1,649	1,368	26		255	(NA)	(NA)	152	352	734	411
June	1,562	1,269	29		264	(NA)	(NA)	158	355	697	352
July	1,704	1,348	40		316	(NA)	(NA)	171	320	768	445
August	1,657	1,285	31		341	(NA)	(NA)	171	337	762	387
September	1,628	1,290	38		300	(NA)	(NA)	135	365	740	388
October	1,636	1,343	26		267	(NA)	(NA)	129	371	764	372
November	1,663	1,344	25		294	(NA)	(NA)	150	389	709	415
December	1,748	1,426	30		292	(NA)	(NA)	157	409	824	358
2000:						(NA)	(NA)				
January <sup>p</sup>	1,775	1,396	29		350	(NA)	(NA)	150	412	829	384
<b>AVERAGE RELATIVE STANDARD ERRORS<sup>2</sup></b>											
Annual	(percent)	1	1	7	11	3	3	3	2	1	1
Monthly	(percent)	3	3	11	13	9	3	9	7	6	4

NA Not available. <sup>p</sup>Preliminary. <sup>f</sup>Revised.

<sup>1</sup>Metropolitan statistical areas.

<sup>2</sup>Average Relative Standard Errors (Avg. RSE): Annual—Avg. RSE for the last 2 years; Monthly—Avg. RSE for the latest 6-month period (January through June or July through December).

Table 2. New Privately Owned Housing Units Authorized in Permit-Issuing Places

[Thousands of units. Detail may not add to total because of rounding]

Period	United States							Northeast			Midwest			South			West			
	Total	In structures with—				Inside MSAs <sup>1</sup>	Outside MSAs <sup>1</sup>	Total	In structures with—		Total	In structures with—		Total	In structures with—		Total	In structures with—		
		1 unit	2 units	3 and 4 units	5 units or more				1 unit	2 units or more		1 unit	2 units or more		1 unit	2 units or more		1 unit	2 units or more	
<b>ANNUAL DATA</b>																				
1995	1,332.5	997.3	32.2	31.5	271.5	1,116.8	215.8	124.2	104.5	19.7	296.6	220.5	76.1	583.2	430.3	152.9	328.5	241.9	86.5	
1996	1,425.6	1,069.5	33.6	32.2	290.3	1,200.0	225.6	136.9	108.8	28.1	317.8	236.6	81.3	623.4	468.5	155.0	347.4	255.6	91.8	
1997	1,441.1	1,062.4	34.9	33.6	310.3	1,220.2	220.9	141.9	111.2	30.7	299.8	220.0	79.8	635.9	464.2	171.7	363.5	267.1	96.5	
1998	1,612.3	1,187.6	33.2	36.0	355.5	1,377.9	234.4	159.4	124.1	35.3	327.2	247.8	79.4	724.5	521.9	202.6	401.2	293.8	107.4	
1999 <sup>2</sup>	1,640.2	1,231.8	32.0	34.4	342.0	1,409.9	230.3	161.5	125.2	36.4	337.0	257.6	79.4	745.5	548.0	197.5	396.2	301.1	95.1	
<b>MONTHLY DATA</b>																				
<b>Not Seasonally Adjusted</b>																				
1997:	January	88.1	65.8	2.4	1.5	18.5	77.5	10.6	9.1	6.5	2.6	13.2	9.2	4.0	43.3	33.6	9.8	22.5	16.4	6.1
	February	94.1	70.3	2.3	1.8	19.7	81.6	12.5	9.1	5.8	3.3	15.7	11.4	4.3	44.6	34.3	10.4	24.6	18.8	5.9
	March	120.1	88.7	2.9	2.5	26.0	102.5	17.6	11.8	8.7	3.0	24.3	18.0	6.3	55.4	39.7	15.7	28.7	22.3	6.4
	April	137.2	104.4	3.5	3.1	26.2	113.1	24.2	12.6	10.4	2.2	32.0	24.3	7.7	61.5	45.0	16.5	31.2	24.8	6.4
	May	131.6	101.3	3.0	2.8	24.6	108.3	23.3	12.8	11.0	1.9	29.4	22.9	6.5	55.8	42.3	13.5	33.5	25.1	8.4
	June	133.6	100.9	3.2	3.4	26.2	111.9	21.7	14.0	11.0	3.0	29.2	22.3	6.9	57.1	42.4	14.8	33.3	25.2	8.1
	July	133.7	99.8	3.3	3.3	27.2	113.0	20.7	13.5	11.1	2.4	27.8	21.6	6.2	58.7	41.8	16.9	33.7	25.3	8.5
	August	126.0	91.8	2.5	2.9	28.7	105.9	20.1	12.9	9.8	3.1	28.3	20.0	8.3	53.4	38.9	14.4	31.4	23.1	8.4
	September	134.4	95.6	3.0	3.2	32.7	113.8	20.6	12.4	10.1	2.3	28.8	20.7	8.2	57.4	40.0	17.5	35.7	24.8	10.9
	October	135.5	97.5	3.7	3.9	30.4	114.5	21.0	12.5	10.7	1.8	29.5	20.7	8.8	58.0	41.4	16.6	35.5	24.8	10.7
	November	100.4	72.5	2.3	2.2	23.3	85.8	14.6	10.6	8.1	2.5	21.3	14.8	6.5	44.0	32.0	12.1	24.5	17.7	6.8
	December	106.4	73.9	2.8	2.9	26.8	92.3	14.1	10.7	8.0	2.7	20.3	14.1	6.2	46.5	32.9	13.6	28.9	18.9	10.0
1998:	January	96.2	70.1	2.0	2.0	22.1	84.6	11.6	9.7	7.0	2.7	14.7	10.9	3.8	46.3	34.4	12.0	25.4	17.8	7.6
	February	107.4	78.1	2.3	2.6	24.4	93.5	13.9	8.9	7.2	1.8	19.7	14.3	5.4	51.2	37.5	13.7	27.5	19.1	8.4
	March	140.9	105.1	2.8	3.3	29.9	121.0	20.0	12.1	10.2	1.9	26.8	20.4	6.4	68.4	47.7	20.7	33.6	26.8	6.9
	April	146.3	113.6	2.7	2.7	27.3	123.3	23.0	13.2	11.4	1.7	31.0	25.2	5.8	63.6	48.0	15.6	38.5	29.0	9.5
	May	138.2	107.3	2.5	2.9	25.5	116.4	21.8	13.3	11.2	2.1	30.7	24.4	6.3	62.5	45.9	16.5	31.8	25.8	5.9
	June	153.4	115.8	3.2	4.3	30.1	129.7	23.7	16.0	12.8	3.2	31.6	25.2	6.4	65.0	48.6	16.4	40.8	29.2	11.6
	July	149.3	111.2	3.3	3.2	31.7	126.1	23.2	15.4	11.9	3.5	29.7	23.4	6.3	66.1	47.7	18.5	38.0	28.2	9.8
	August	144.7	104.4	3.1	3.0	34.1	122.8	21.9	14.3	11.1	3.2	28.9	21.8	7.1	67.1	46.5	20.6	34.4	25.1	9.4
	September	141.7	102.5	2.9	3.4	32.9	120.8	20.9	14.7	11.0	3.7	30.3	22.1	8.1	62.2	44.0	18.2	34.7	25.4	9.2
	October	149.8	103.8	3.0	3.7	39.3	126.8	23.1	15.7	11.1	4.6	32.4	23.6	8.8	65.8	44.0	21.9	35.9	25.1	10.7
	November	119.9	86.6	2.4	2.3	28.6	104.1	15.8	13.4	9.8	3.6	24.9	18.9	6.0	51.2	37.2	14.1	30.3	20.7	9.5
	December	124.5	89.0	3.1	2.6	29.8	108.8	15.7	12.7	9.5	3.2	26.5	17.6	8.9	55.1	40.6	14.5	30.2	21.3	8.8
1999:	January	105.3	73.7	2.2	2.3	27.1	93.7	11.6	9.0	6.6	2.3	13.3	10.3	3.1	55.9	37.6	18.3	27.1	19.2	7.8
	February	113.3	85.8	2.2	2.4	22.9	99.5	13.8	9.5	7.6	1.9	18.6	14.6	4.0	58.6	43.1	15.5	26.6	20.5	6.1
	March	152.1	117.7	2.9	3.1	28.4	130.5	21.6	14.0	10.4	3.6	31.5	23.9	7.6	69.8	53.9	15.8	36.7	29.4	7.4
	April	149.1	118.3	2.9	3.3	24.6	125.8	23.3	15.1	12.4	2.7	33.7	27.0	6.6	65.8	50.8	15.0	34.6	28.1	6.5
	May	141.7	114.1	2.7	2.3	22.6	120.0	21.7	14.2	12.3	2.0	32.8	25.1	7.7	59.3	48.7	10.6	35.3	28.1	7.3
	June	165.6	125.7	3.4	3.2	33.2	140.4	25.2	18.0	12.9	5.2	33.6	26.8	6.8	71.0	52.3	18.7	43.0	33.8	9.2
	July	145.5	112.4	2.5	2.7	27.8	124.4	21.1	14.6	12.0	2.6	29.5	24.1	5.4	65.5	48.4	17.2	35.9	27.9	7.9
	August	147.4	110.3	2.6	3.3	31.2	125.6	21.8	14.9	11.7	3.2	32.2	24.6	7.6	66.7	48.5	18.2	33.6	25.5	8.1
	September	133.0	100.9	3.1	2.6	26.4	112.5	20.5	12.9	10.1	2.8	31.0	23.5	7.5	56.7	43.2	13.5	32.4	24.2	8.3
	October	133.1	95.4	2.7	3.0	32.0	113.8	19.3	12.3	9.6	2.7	30.0	22.7	7.4	60.6	40.9	19.7	30.2	22.2	8.0
	November	121.1	88.2	2.5	3.1	27.3	103.8	17.4	13.1	9.3	3.8	28.0	19.6	8.5	53.1	39.3	13.8	27.0	20.1	6.9
	December <sup>r</sup>	117.1	82.8	2.3	2.9	29.1	103.7	13.4	11.8	8.6	3.2	21.0	15.2	5.7	54.5	37.2	17.3	29.8	21.7	8.1
2000:	January <sup>p</sup>	104.0	75.4	1.7	1.8	25.1	91.6	12.4	10.7	6.6	4.1	16.4	12.4	4.0	50.0	37.4	12.6	26.9	19.1	7.8

See footnotes at end of table.

**Table 2. New Privately Owned Housing Units Authorized in Permit-Issuing Places—Con.**

[Thousands of units. Detail may not add to total because of rounding]

Period	United States							Northeast			Midwest			South			West		
	Total	In structures with—				Inside MSAs <sup>1</sup>	Outside MSAs <sup>1</sup>	Total	In structures with—		Total	In structures with—		Total	In structures with—		Total	In structures with—	
		1 unit	2 units	3 and 4 units	5 units or more				1 unit	2 units or more		1 unit	2 units or more		1 unit	2 units or more		1 unit	2 units or more
<b>MONTHLY DATA—Con.</b>																			
<b>Seasonally Adjusted Annual Rate</b>																			
1997:	January	1,382	1,046	64	272	(NA)	(NA)	160	121	39	295	215	80	590	458	132	337	252	85
	February	1,445	1,070	65	310	(NA)	(NA)	173	116	57	301	216	85	609	459	150	362	279	83
	March	1,436	1,031	66	339	(NA)	(NA)	153	114	39	300	218	82	647	446	201	336	253	83
	April	1,421	1,054	70	297	(NA)	(NA)	129	105	24	312	228	84	646	466	180	334	255	79
	May	1,414	1,046	65	303	(NA)	(NA)	132	107	25	289	216	73	618	456	162	375	267	108
	June	1,402	1,057	67	278	(NA)	(NA)	141	111	30	301	222	79	624	467	157	336	257	79
	July	1,440	1,050	74	316	(NA)	(NA)	136	109	27	287	214	73	658	459	199	359	268	91
	August	1,449	1,061	65	323	(NA)	(NA)	141	107	34	309	221	88	626	462	164	373	271	102
	September	1,494	1,091	67	336	(NA)	(NA)	138	112	26	304	221	83	654	472	182	398	286	112
	October	1,499	1,098	76	325	(NA)	(NA)	134	114	20	295	218	79	677	485	192	391	281	110
	November	1,469	1,093	62	314	(NA)	(NA)	141	110	31	297	220	77	652	487	165	379	276	103
	December	1,456	1,080	77	299	(NA)	(NA)	149	117	32	307	238	69	621	461	160	379	264	115
1998:	January	1,578	1,165	68	345	(NA)	(NA)	176	134	42	341	259	82	662	486	176	399	286	113
	February	1,661	1,200	77	384	(NA)	(NA)	171	143	28	376	270	106	706	502	204	408	285	123
	March	1,606	1,162	72	372	(NA)	(NA)	151	126	25	318	234	84	750	510	240	387	292	95
	April	1,529	1,155	57	317	(NA)	(NA)	140	119	21	306	240	66	674	498	176	409	298	111
	May	1,549	1,174	64	311	(NA)	(NA)	142	114	28	318	245	73	713	525	188	376	290	86
	June	1,531	1,143	73	315	(NA)	(NA)	151	121	30	307	233	74	680	505	175	393	284	109
	July	1,626	1,191	74	361	(NA)	(NA)	160	119	41	315	237	78	744	530	214	407	305	102
	August	1,670	1,202	72	396	(NA)	(NA)	158	124	34	312	240	72	800	550	250	400	288	112
	September	1,569	1,171	70	328	(NA)	(NA)	159	119	40	320	240	80	708	521	187	382	291	91
	October	1,726	1,210	69	447	(NA)	(NA)	174	122	52	336	254	82	801	534	267	415	300	115
	November	1,688	1,254	63	371	(NA)	(NA)	178	132	46	338	271	67	723	542	181	449	309	140
	December	1,708	1,296	77	335	(NA)	(NA)	177	138	39	399	294	105	733	567	166	399	297	102
1999:	January	1,778	1,279	79	420	(NA)	(NA)	169	133	36	324	257	67	833	564	269	452	325	127
	February	1,738	1,306	72	360	(NA)	(NA)	181	151	30	352	275	77	810	575	235	395	305	90
	March	1,654	1,242	69	343	(NA)	(NA)	163	123	40	356	264	92	744	552	192	391	303	88
	April	1,572	1,214	67	291	(NA)	(NA)	162	128	34	338	256	82	692	532	160	380	298	82
	May	1,591	1,243	59	289	(NA)	(NA)	155	128	27	338	253	85	692	554	138	406	308	98
	June	1,641	1,241	64	336	(NA)	(NA)	167	121	46	330	250	80	736	544	192	408	326	82
	July	1,641	1,247	63	331	(NA)	(NA)	157	124	33	323	250	73	761	558	203	400	315	85
	August	1,619	1,210	66	343	(NA)	(NA)	157	124	33	333	256	77	746	549	197	383	281	102
	September	1,506	1,171	63	272	(NA)	(NA)	147	114	33	333	258	75	664	520	144	362	279	83
	October	1,594	1,178	62	354	(NA)	(NA)	142	111	31	328	258	70	751	529	222	373	280	93
	November	1,612	1,200	68	344	(NA)	(NA)	161	117	44	352	260	92	720	539	181	379	284	95
	December <sup>r</sup>	1,622	1,228	70	324	(NA)	(NA)	166	126	40	327	260	67	732	529	203	397	313	84
2000:	January <sup>p</sup>	1,763	1,303	62	398	(NA)	(NA)	198	132	66	381	305	76	754	555	199	430	311	119
<b>AVERAGE RELATIVE STANDARD ERRORS<sup>3</sup></b>																			
Annual	(percent)	(Z)	(Z)	2	3	(Z)	(Z)	2	1	1	4	1	1	2	Z	1	1	1	1
Monthly	(percent)	1	(Z)	3	7	(Z)	(Z)	3	2	2	3	1	1	3	1	1	2	1	1

NA Not available. <sup>p</sup>Preliminary. <sup>r</sup>Revised. Z Less than 0.5 percent.

<sup>1</sup>Metropolitan statistical areas.

<sup>2</sup>Reflects revisions not distributed to months.

<sup>3</sup>Average Relative Standard Errors (Avg. RSE): Annual—RSE for the latest year; Monthly—Avg. RSE for the latest 6-month period (January through June or July through December).

Table 3. **New Privately Owned Housing Units Authorized, but Not Started, in Permit-Issuing Places at End of Period**

[Thousands of units. Detail may not add to total because of rounding]

Authorized, but not started at end of period	United States				Northeast				Midwest				South				West			
	Total	In structures with—			Total	In structures with—			Total	In structures with—			Total	In structures with—			Total	In structures with—		
		1 unit	2 to 4 units	5 units or more		1 unit	2 to 4 units	5 units or more		1 unit	2 to 4 units	5 units or more		1 unit	2 to 4 units	5 units or more		1 unit	2 to 4 units	5 units or more
<b>END OF YEAR</b>																				
<b>16,000-Place Series</b>																				
1980	173.6	70.1	15.3	88.2	26.0	12.3	1.2	12.6	17.5	6.8	2.9	7.8	88.5	32.9	6.5	49.1	41.6	18.1	4.8	18.7
1981	145.5	60.1	10.7	74.7	23.3	11.5	0.9	10.8	10.0	5.0	1.7	3.2	77.5	29.8	4.9	42.8	34.7	13.8	3.1	17.9
1982	167.8	66.9	11.6	89.3	19.4	9.4	1.0	9.0	10.4	4.5	1.7	4.2	100.3	38.5	5.9	55.9	37.7	14.5	2.9	20.2
1983	178.0	68.9	13.0	96.1	21.9	12.6	1.1	8.2	12.2	5.2	1.8	5.1	104.2	33.6	6.8	63.8	39.8	17.4	3.3	19.0
1984	192.5	66.2	10.2	116.1	23.2	10.8	1.2	11.2	14.0	5.1	1.5	7.5	109.4	34.5	4.8	70.1	45.8	15.7	2.7	27.4
<b>17,000-Place Series</b>																				
1985	223.3	80.6	13.7	129.0	36.9	19.2	2.1	15.7	20.4	5.8	2.2	12.4	120.6	43.3	5.7	71.6	45.4	12.3	3.8	29.3
1986	205.2	92.8	12.3	100.2	34.4	21.2	2.4	10.8	21.1	6.4	2.3	12.4	91.3	43.5	3.8	43.9	58.4	21.7	3.7	33.0
1987	155.0	79.3	11.1	64.6	36.8	23.3	2.1	11.4	11.9	6.5	2.2	3.2	68.6	33.8	3.5	31.4	37.7	15.7	3.3	18.6
1988	156.4	76.4	9.9	70.1	32.9	20.0	1.9	11.0	15.5	5.9	2.3	7.3	64.0	30.4	2.9	30.7	44.0	20.1	2.7	21.1
1989	173.9	93.1	8.4	72.5	34.1	25.1	1.6	7.4	18.0	7.5	1.8	8.7	73.5	34.3	2.1	37.1	48.3	26.2	2.8	19.2
1990	131.6	75.0	8.5	48.1	25.8	20.0	1.3	4.5	14.2	5.7	2.2	6.3	55.1	27.3	2.1	25.7	36.5	22.0	2.9	11.6
1991	126.3	71.1	4.7	50.6	24.4	17.3	0.7	6.4	16.9	6.4	1.4	9.1	51.3	26.0	1.3	24.0	33.8	21.4	1.4	11.1
1992	108.7	71.9	5.1	31.7	18.6	13.5	0.7	4.5	13.4	8.8	1.7	2.9	49.8	33.3	1.3	15.2	26.9	16.3	1.5	9.1
1993	118.9	72.5	3.7	42.8	22.3	15.4	0.5	6.4	14.3	8.6	1.2	4.5	58.5	35.2	1.0	22.3	23.8	13.2	1.0	9.6
1994	115.6	66.0	3.6	46.1	17.1	12.2	0.4	4.5	13.1	8.3	1.2	3.7	58.1	31.2	1.1	25.8	27.3	14.2	1.0	12.1
<b>19,000-Place Series</b>																				
1995	142.2	80.1	4.5	57.6	18.3	13.5	0.5	4.3	18.7	12.8	1.4	4.5	71.6	36.7	1.3	33.6	33.5	17.1	1.2	15.2
1996	126.4	67.5	4.8	54.2	16.0	9.0	0.6	6.4	16.6	10.6	1.7	4.2	68.1	32.3	1.3	34.4	25.8	15.5	1.2	9.2
1997	111.1	63.6	3.7	43.8	11.3	7.1	0.4	3.8	14.1	9.2	1.3	3.6	58.7	32.0	1.2	25.5	26.9	15.2	0.8	10.8
1998	137.1	79.5	3.1	54.5	16.0	10.2	0.5	5.3	18.2	11.8	1.1	5.3	75.9	41.4	0.8	33.7	27.1	16.2	0.7	10.2
1999 <sup>f</sup>	139.5	79.8	3.9	55.8	15.6	8.9	0.6	6.1	16.2	11.2	1.2	3.9	78.9	40.1	1.2	37.7	28.7	19.6	1.0	8.1
<b>END OF MONTH</b>																				
1999:																				
January	135.3	76.1	2.8	56.4	16.6	10.9	0.5	5.2	18.1	11.0	0.8	6.2	75.3	38.4	0.8	36.0	25.3	15.7	0.6	9.0
February	137.2	78.5	3.3	55.4	16.2	11.5	0.6	4.2	20.5	12.2	0.9	7.3	73.3	37.7	1.0	34.6	27.2	17.2	0.7	9.3
March	141.5	84.0	3.2	54.4	17.5	11.2	0.5	5.8	22.6	15.3	1.0	6.4	72.4	38.7	1.0	32.7	29.0	18.8	0.7	9.6
April	148.3	94.8	2.8	50.7	19.7	13.4	0.4	5.8	25.5	20.0	0.8	4.7	75.5	43.6	0.9	31.0	27.6	17.9	0.6	9.2
May	139.5	86.9	3.4	49.1	18.9	12.7	0.5	5.7	24.4	17.5	1.1	5.8	71.0	40.7	1.1	29.3	25.1	16.0	0.7	8.4
June	157.0	96.2	3.6	57.2	20.5	12.4	0.5	7.6	21.1	15.6	1.2	4.2	81.3	46.2	1.1	33.9	34.2	22.0	0.7	11.5
July	154.5	94.7	4.1	55.7	17.5	12.3	0.6	4.6	22.5	16.6	1.3	4.6	83.8	45.4	1.3	37.0	30.7	20.4	0.8	9.5
August	150.1	92.1	5.0	53.1	15.7	11.2	0.8	3.8	22.3	16.6	1.4	4.2	84.8	45.5	1.8	37.5	27.3	18.8	1.0	7.6
September	145.6	93.2	3.6	48.8	15.9	11.1	0.6	4.1	21.2	15.9	1.1	4.2	80.6	47.9	1.2	31.6	27.9	18.3	0.8	8.9
October	133.5	80.4	3.3	49.8	14.6	10.3	0.5	3.9	16.0	12.5	1.1	2.4	75.9	40.7	1.1	34.1	27.0	16.9	0.7	9.4
November <sup>f</sup>	133.0	78.3	2.9	51.8	14.6	9.1	0.5	5.0	18.5	12.2	0.9	5.4	76.5	41.3	0.9	34.4	23.4	15.7	0.6	7.1
December <sup>f</sup>	139.5	79.8	3.9	55.8	15.6	8.9	0.6	6.1	16.2	11.2	1.2	3.9	78.9	40.1	1.2	37.7	28.7	19.6	1.0	8.1
2000:																				
January <sup>p</sup>	135.7	78.3	3.5	53.9	17.3	9.3	0.5	7.5	16.5	11.5	1.0	4.1	74.4	40.3	1.0	33.1	27.4	17.2	1.0	9.3
<b>AVERAGE RELATIVE STANDARD ERRORS<sup>1</sup></b>																				
End of period . . . (percent) . .	3	4	8	5	13	20	19	4	8	8	12	25	4	4	15	7	6	8	15	9

<sup>p</sup>Preliminary. <sup>f</sup>Revised.

<sup>1</sup>Average Relative Standard Errors: Average for the latest 6-month period (January through June or July through December).

Note: These backlog data represent the number of housing units authorized in all months up to and including the last day of the reporting period and not started as of that date without regard to the months of original permit issuance. Cancelled, abandoned, expired, and revoked permits are excluded from the backlog.

**Table 4. New Privately Owned Housing Units Started by Location and Type of Structure**

[Thousands of units. Detail may not add to total because of rounding]

Period	United States			Inside MSAs <sup>1</sup>			Outside MSAs <sup>1</sup>			Northeast			Midwest			South			West		
	In structures with—			In structures with—			In structures with—			In structures with—			In structures with—			In structures with—					
	Total <sup>2</sup>	1 unit	5 units or more	Total <sup>2</sup>	1 unit	5 units or more	Total <sup>2</sup>	1 unit	5 units or more	Total <sup>2</sup>	1 unit	5 units or more	Total <sup>2</sup>	1 unit	5 units or more	Total <sup>2</sup>	1 unit	5 units or more	Total <sup>2</sup>	1 unit	5 units or more
<b>ANNUAL DATA</b>																					
1980	1,292	852	331	914	563	271	379	289	59	125	87	30	218	142	56	643	428	165	306	196	80
1981	1,084	705	288	760	458	236	324	247	52	117	84	25	165	110	40	562	363	153	240	148	69
1982	1,062	663	320	785	452	274	277	211	46	117	79	31	149	99	38	591	357	189	205	127	61
1983	1,703	1,068	522	1,351	795	464	352	272	58	168	123	35	218	153	48	935	557	317	382	234	121
1984	1,750	1,084	544	1,415	830	491	335	254	53	204	158	35	243	167	60	866	528	274	436	230	175
1985	1,742	1,072	576	1,494	882	535	248	190	41	252	182	55	240	148	77	782	504	240	468	239	204
1986	1,805	1,179	542	1,546	970	508	259	209	34	294	228	50	296	188	91	733	504	201	483	261	200
1987	1,620	1,146	409	1,372	934	385	248	212	24	269	204	50	298	203	81	634	485	129	420	255	148
1988	1,488	1,081	348	1,243	874	323	245	207	25	235	181	42	274	194	66	575	443	115	404	264	125
1989	1,376	1,003	318	1,128	798	289	248	205	29	178	132	37	266	190	62	536	409	109	396	272	108
1990	1,193	895	260	947	685	233	246	210	27	131	104	21	253	193	50	479	371	99	329	226	91
1991	1,014	840	138	789	648	117	225	193	21	113	99	8	233	191	31	414	353	51	254	197	47
1992	1,200	1,030	139	932	793	117	268	237	22	127	112	11	288	236	42	497	438	50	288	244	36
1993	1,288	1,126	133	1,032	897	114	256	229	19	126	116	8	298	251	37	562	498	55	302	261	33
1994	1,457	1,198	224	1,183	958	200	274	241	23	138	123	12	329	268	50	639	522	107	351	286	54
1995	1,354	1,076	244	1,106	861	221	248	215	23	118	102	12	290	234	46	615	485	119	331	256	67
1996	1,477	1,161	271	1,211	936	242	265	225	29	132	112	15	321	254	51	662	524	125	361	271	79
1997	1,474	1,134	296	1,221	923	267	253	211	29	137	111	21	304	238	48	670	507	151	363	278	76
1998	1,617	1,271	303	1,350	1,036	280	267	235	23	148	122	21	330	273	45	743	574	155	395	303	83
1999 <sup>†</sup>	1,665	1,333	300	1,403	1,098	279	262	235	20	154	128	20	357	297	49	761	596	155	393	312	75
<b>QUARTERLY DATA</b>																					
1996: 1st quarter	303	240	57	253	198	52	49	42	6	21	18	2	53	43	8	145	117	27	84	62	20
2nd quarter	428	344	69	348	275	62	80	69	7	39	33	4	96	78	13	188	154	30	105	79	22
3rd quarter	410	324	75	332	257	66	78	67	9	38	33	4	99	78	17	176	139	34	97	74	20
4th quarter	335	252	69	278	206	62	58	47	8	34	27	5	74	55	14	152	115	34	76	55	17
1997: 1st quarter	297	238	51	255	202	47	42	36	4	26	20	5	49	40	6	143	115	26	80	63	15
2nd quarter	419	325	83	342	260	74	77	65	9	36	31	5	92	74	14	190	143	43	101	77	21
3rd quarter	400	315	75	328	252	68	72	62	7	40	33	6	88	72	12	177	134	39	96	75	18
4th quarter	357	257	86	296	209	78	62	48	8	35	28	6	75	52	16	161	115	43	87	62	22
1998: 1st quarter	325	258	57	279	219	52	46	39	5	28	22	5	55	45	7	157	125	29	84	66	16
2nd quarter	448	360	74	366	287	68	82	73	6	40	34	4	97	83	9	200	158	38	111	85	23
3rd quarter	445	348	86	369	281	80	76	67	7	41	35	5	92	76	13	201	153	44	111	84	24
4th quarter	399	305	86	336	250	79	63	55	6	39	31	7	86	68	15	185	138	44	89	68	20
1999: 1st quarter	370	294	68	318	248	64	52	46	4	30	24	5	59	52	5	193	149	41	88	69	17
2nd quarter	455	377	69	378	307	64	76	70	5	43	38	4	106	90	14	196	159	34	110	91	17
3rd quarter	453	356	88	381	291	82	73	64	6	46	36	8	99	81	14	197	152	42	111	86	23
4th quarter <sup>†</sup>	387	307	74	326	252	69	61	55	5	35	31	4	92	74	15	176	137	37	85	65	18
<b>AVERAGE RELATIVE STANDARD ERRORS<sup>3</sup></b>																					
Annual . . . . . (percent) . . . . .	1	1	5	1	1	5	4	5	13	6	3	36	3	3	10	2	2	6	1	1	3
Quarterly . . . . . (percent) . . . . .	1	1	5	1	1	5	6	6	22	3	4	8	4	4	18	2	2	6	2	1	6

<sup>†</sup>Revised.

<sup>1</sup>Metropolitan statistical areas.

<sup>2</sup>Includes units started in structures with two to four units.

<sup>3</sup>Average Relative Standard Errors (Avg. RSE): Annual—Avg. RSE for the last 2 years; Quarterly—Avg. RSE for the latest 2-quarter period (quarter 1 through quarter 2 or quarter 3 through quarter 4).

**Table 5. New Privately Owned Housing Units Started by Purpose of Construction**

[Thousands of units. Detail may not add to total because of rounding]

Period	In structures with—								
	Total	1 unit					2 units or more		
		Total	For sale <sup>1</sup>	For owner occupancy on owner's land		For rent	Total	For sale	For rent
				Contractor built	Owner built				
<b>ANNUAL DATA</b>									
1979.....	1,745	1,194	742	213	222	17	551	173	378
1980.....	1,292	852	526	149	164	12	440	163	277
1981.....	1,084	705	426	122	148	10	379	158	221
1982.....	1,062	663	409	108	133	12	400	140	259
1983.....	1,703	1,068	713	151	179	24	635	210	425
1984.....	1,750	1,084	728	157	165	33	665	206	459
1985.....	1,742	1,072	713	177	157	26	669	154	515
1986.....	1,805	1,179	782	204	166	27	626	143	483
1987.....	1,620	1,146	732	208	178	28	474	130	344
1988.....	1,488	1,081	709	196	154	22	407	99	307
1989.....	1,376	1,003	648	192	144	19	373	87	286
1990.....	1,193	895	529	196	147	22	298	56	241
1991.....	1,014	840	490	198	138	14	174	41	132
1992.....	1,200	1,030	618	224	168	19	170	41	128
1993.....	1,288	1,126	716	225	162	22	162	44	118
1994.....	1,457	1,198	763	245	169	22	259	52	206
1995.....	1,354	1,076	712	199	133	33	278	51	227
1996.....	1,477	1,161	774	218	144	25	316	59	257
1997.....	1,474	1,134	784	189	131	29	341	59	282
1998.....	1,617	1,271	882	209	144	36	346	59	287
1999 <sup>r</sup> .....	1,665	1,333	938	213	143	40	331	64	267
<b>QUARTERLY DATA</b>									
1994: 1st quarter.....	294	253	176	46	26	5	41	12	30
2nd quarter.....	423	354	221	75	54	4	69	14	54
3rd quarter.....	398	326	199	71	50	5	72	16	56
4th quarter.....	342	266	170	52	36	7	77	12	64
1995: 1st quarter.....	270	214	149	37	25	4	56	11	45
2nd quarter.....	371	297	195	54	37	10	74	15	59
3rd quarter.....	387	308	198	59	42	9	79	13	66
4th quarter.....	326	257	177	46	27	8	69	12	57
1996: 1st quarter.....	303	240	175	40	21	4	63	11	52
2nd quarter.....	428	344	229	70	39	5	85	18	67
3rd quarter.....	410	324	210	63	44	7	87	18	68
4th quarter.....	335	252	171	46	30	5	83	16	67
1997: 1st quarter.....	297	238	175	36	22	5	59	13	46
2nd quarter.....	419	325	220	56	40	7	94	18	77
3rd quarter.....	400	315	215	55	38	7	86	17	69
4th quarter.....	357	257	178	42	29	8	101	13	88
1998: 1st quarter.....	325	258	195	36	23	5	67	13	53
2nd quarter.....	448	360	249	60	43	8	88	16	72
3rd quarter.....	445	348	229	67	43	10	97	16	81
4th quarter.....	399	305	214	49	33	8	95	16	79
1999: 1st quarter.....	370	294	219	42	26	8	75	16	59
2nd quarter.....	455	377	257	65	45	10	77	16	61
3rd quarter <sup>r</sup> .....	453	356	250	57	41	8	98	16	82
4th quarter <sup>p</sup> .....	387	307	216	49	31	11	81	15	65
<b>AVERAGE RELATIVE STANDARD ERRORS<sup>2</sup></b>									
Annual.....(percent).....	1	1	2	7	6	13	3	13	4
Quarterly.....(percent).....	1	1	2	7	7	16	6	19	7

<sup>p</sup>Preliminary. <sup>r</sup>Revised.

<sup>1</sup>Includes houses already sold when construction started.

<sup>2</sup>Average Relative Standard Errors (Avg. RSE): Annual—Avg. RSE for the last 2 years; Quarterly—Avg. RSE for the latest 2-quarter period (quarter 1 through quarter 2 or quarter 3 through quarter 4).

Notes: Housing units for which purpose of construction was not reported have been distributed proportionally to those for which the information was reported. Quarterly estimates may not add to the annual figures as the latter includes late reports and corrections.



# Appendix A.

## Definitions and Survey Description

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### DEFINITIONS

The start of construction of a privately owned housing unit is when excavation begins for the footings or foundation of a building intended primarily as a housekeeping residential structure and designed for nontransient occupancy. All housing units in a multifamily building are defined as being started when excavation for the building has begun. Beginning with statistics for September 1992, estimates of housing starts include units in residential structures being totally rebuilt on an existing foundation.

A housing unit is a house, an apartment, a group of rooms or a single room intended for occupancy as separate living quarters. Separate living quarters are those in which the occupants live separately from any other individuals in the building and which have a direct access from the outside of the building or through a common hall.

A housekeeping residential building is one consisting primarily of housing units. New housing starts exclude group quarters (such as dormitories and rooming houses), transient accommodations (such as transient hotels, motels, and tourist courts), manufacturer homes (trailers), moved or relocated buildings, and housing units created in an existing residential or nonresidential structure. However, in a building combining substantial residential and nonresidential floor areas, every effort is made to include the residential units in these statistics, even though the primary function of the entire building is for nonresidential purposes.

Housing units, as distinguished from manufacturer homes, include conventional “stick-built” units, prefabricated, panelized, components, sectional, and modular units. Except for Table 5, manufacturer homes—single-wide and multiwide—are excluded from the statistics. A manufacturer home is defined as a portable dwelling constructed to be towed on its own chassis and designed for use without a permanent foundation; it is manufactured with the transportation gear as an integral part of the unit and can be towed from site to site.

Publicly owned housing units (contract awards) are excluded from the statistics. Units in structures built by private developers with partial public subsidies or which are for sale upon completion to local public housing authorities under the HUD “Turnkey” program are both classified as private housing.

The statistics, by type of structure, refer to the structural characteristics of the building. The one-unit structure category includes fully detached, semidetached (semi-

attached, side-by-side), rowhouses, and townhouses. In the case of attached units, each must be separated from the adjacent unit by a ground-to-roof wall in order to be classified as a one-unit structure. Also, these units must not share heating/air-conditioning systems or interstructural public utilities, such as water supply, power supply, or sewage disposal lines. Units built one on top of another and those built side-by-side which do not have a ground-to-roof wall and/or have common facilities (i.e., attic, basement, heating plant, plumbing, etc.) are classified by the number of units in the structure (i.e., two-unit structure, three-unit structure, etc.). In these statistics, apartment buildings are defined as buildings containing five units or more. Apartments in a conventional-type apartment building may share a common basement, heating plant, stairs, entrance halls, and water supply and sewage disposal facilities. Townhouse apartments, though attached, are not separated by a ground-to-roof wall and/or share some interstructural facilities, such as water supply, sewage disposal, etc.

Ownership is not the criterion for structural classifications in this report. A condominium apartment building is classified with apartment buildings in structures with five units or more, despite the fact that each unit is individually owned. Condominium townhouses may be in the one-unit category if each unit is separated from its neighbor by a ground-to-roof wall (no commonly shared interstructural facilities), or in the multiunit building categories if they are not separated from each other by a ground-to-roof wall (share interstructural facilities).

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, New Jersey, and Pennsylvania; **Midwest** — Ohio, Indiana, Illinois, Michigan, Wisconsin, Minnesota, Iowa, Missouri, North Dakota, South Dakota, Nebraska, and Kansas; **South** — Delaware, Maryland, District of Columbia, Virginia, West Virginia, North Carolina, South Carolina, Georgia, Florida, Kentucky, Tennessee, Alabama, Mississippi, Arkansas, Louisiana, Oklahoma, and Texas; **West** — Montana, Idaho, Wyoming, Colorado, New Mexico, Arizona, Utah, Nevada, Washington, Oregon, California, Alaska, and Hawaii.

The distribution of housing starts between units inside and outside metropolitan statistical areas (MSAs) is based on the definitions published by the Office of Management

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and Budget in *Metropolitan Statistical Areas*. Data for the period beginning January 1994 are based on the 1992 definitions, as amended June 1993; data for the period January-December 1993 are based on the 1992 definitions; data for January 1984-December 1992 are based on the 1974 definitions, as amended June 1983; data for January 1976-December 1983 are based on the 1974 definitions, as amended August 1975; data for January 1975-December 1975 are based on the 1967 definitions, as amended April 1974; data for January 1974-December 1974 are based on the 1967 definitions, as amended November 1973; data for April 1973-December 1973 are based on the 1967 definitions, as amended February 1973; data for April 1968-March 1973 are based on the 1967 definitions.

### **SAMPLE DESIGN AND SELECTION**

The sample design for the Survey of Construction is a stratified multistage cluster design derived from the Current Population Survey (CPS), 1980 design. Each state was divided into areas made up of counties (towns in New England) and independent cities. These areas were grouped within each state to form strata for the CPS according to metropolitan status and 1980 labor force, race/ethnic origin, population change, and family and housing characteristics. One area from each of the strata was selected with probability proportional to the number of persons 16 years of age and older. The CPS strata were further stratified into 169 strata according to Census region, metropolitan status, building permit activity in 1982, population, and the percent of the population in areas which do not issue permits. One of the CPS selected areas was chosen from each of these 169 strata with probability proportional to the number of persons 16 and older.

Within each of these 169 areas, the sample was selected from two different sample frames: permit-issuing places and land areas not covered by building permit systems.

Each of the 17,000 permit-issuing places was assigned to one of six size classes based on a weighted average of 1978, 1981, and 1982 permit activity. The permit places in each of the 169 areas were grouped into these six size classes and a systematic sample of places was selected from each one of them. Places were selected at different sampling rates in each of the classes so that larger proportions of the places were selected from the larger size classes. For example, all places in the largest size classes fell into sample if they were in the 169 areas, whereas, only an expected 1 in 40 of the places in the smallest size class fell into sample. Approximately 840 permit-issuing places were selected.

Monthly, census field representatives sample permits from these 840 permit-issuing places. They select permits for one-to-four-unit buildings with probability proportional

to the number of units at an overall rate of 1 in 40. All permits for buildings with five units or more are selected.

Within each of the 169 areas, the land not covered by building permit systems, called nonpermit areas, was identified. Small land areas (1980 Census enumeration districts) in these nonpermit areas were grouped into two strata according to the 1980 population. Overall, 1 out of every 120 land areas was selected from the strata with the larger areas and 1 out of 600 was selected from the strata with the smaller areas. Monthly, census field representatives intensively canvassed about 130 selected land areas looking for all housing units started.

In January 1995, the area covered by building permit systems was expanded to 19,000 permit-issuing places. Canvassing was stopped in those selected land areas now represented by permit-issuing places. Census field representatives continue to canvass monthly about 70 land areas still not covered by building permit systems.

### **HOUSING STARTS COMPILATION**

The compilation of the housing starts series is a multistage process. First, an estimate is made monthly of the number of housing units for which building permits have been issued in all 19,000 permit-issuing places (Table 2). The estimate of building permit authorizations is based on a sample of 8,500 of these 19,000 jurisdictions.

Second, for each permit selected in the 840 permit-issuing places, an inquiry is made of the owner or the builder to determine in which month and year the unit(s) covered by the permit was (were) started. In case the units authorized by permits in a particular month are not started by the end of that month, follow-ups are made in successive months to find out when the units were actually started.

From this sample of permits, ratios are calculated (by type of structure) of the number of units started to the number of units covered by permits; separate ratios are calculated for units started from permits of that month and of each preceding month. These ratios, or starts rates, are then applied to the appropriate estimate of the number of units authorized by permits in the corresponding months to provide estimates of the number of units started for each month of authorization.

Having produced estimates of the number of units started with permit authorization, two additional adjustments are made.

1. An upward adjustment of 3.3 percent is made to the number of one-unit structures (single-family houses) started to account for those units started within permit-issuing areas but without permit authorization. (A study spanning a four year period indicated that permits were obtained for all buildings with two housing units or more.)

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2. Upward imputations are made to account for those units started prior to permit authorization and for late reports.

The estimates for housing units started in the 19,000 permit-issuing places result from the procedures outlined above.

Third, units identified as started in the monthly canvass of nonpermit areas are weighted appropriately to provide an estimate of total housing starts in areas not covered by building permit systems.

Addition of this estimate of starts in nonpermit areas to the estimate of starts in the 19,000 permit-issuing places results in an estimate of total private housing units started (Table 1).

### **STARTS BY TYPE OF STRUCTURE**

A total of 14 different sets of starts rates that change from month-to-month are utilized to calculate the number of housing units started by type of structure in permit places. Eight sets of starts rates are used for one-unit structures: separate sets of rates for metropolitan and nonmetropolitan areas within each of the four regions. For structures with five units or more, separate sets of starts rates are used for each of the four regions. Single sets of starts rates are used for all regions for structures with two units and for structures with three and four units.

Starts by type of structure in nonpermit areas are calculated directly in the estimating procedure described above.

### **BUILDING PERMITS**

Data on housing units authorized by local building permits relate to the time of issuance rather than to the actual start of construction. They do, however, provide some indication of residential building activity in advance of the start of actual construction. Although construction is started on most residential buildings in the same month in which the permit is issued, several months may pass before start of construction.

The 19,000 areas with local building permit systems for which figures are currently given in this report (Table 2) account for a major portion of residential building in the United States. For the country as a whole, approximately 96 percent of private housing units are now constructed in permit-issuing places. Beginning with 1994, data are based upon 19,000 places. Data for 1985 through 1994 are for 17,000 places; data for 1978 through 1984 are for 16,000 places; data for 1971 through 1978 are for 14,000 places; data for 1968 through 1972 are for 13,000 places.

Monthly estimates of building permit authorizations are based on reports from a stratified probability sample of 8,500 local building permit jurisdictions. A more detailed description of the sample is provided in the Census Bureau's monthly C40 series, *Housing Units Authorized by Building Permits*.

### **RELIABILITY OF DATA**

The various estimates of privately owned housing units started and privately owned housing units authorized by building permits which are shown in this publication are based on sample surveys and may differ from statistics which would have been obtained from a complete census using the same schedules 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 effects of these errors.

#### **Measures of Sampling Errors**

Sampling error reflects the fact that only a particular sample was surveyed rather than the entire population. Each sample selected for the Housing Starts and Building Permits surveys 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 the standard errors have been computed from the sample data for selected statistics in this report. They are presented in the tables in the form of average 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. For example, suppose Table 1 of this report showed that an estimated 110,000 units in one-unit structures were started in a particular month. Further, suppose that the average relative standard error of this estimate is 3 percent. Multiplying 110,000 by 0.03, we obtain 3,300 as the standard error. This means that we are confident, with 2 chances out of 3 being correct, that the average estimate from all possible samples of one-unit structures started during the particular month is between 113,300 and 106,700 units. To increase the probability to about 9 chances out of 10 that the interval contains the average value over all possible samples (this is called a 90-percent confidence interval), multiply 3,300 by 1.6, yielding limits of 115,280 and 104,720 (110,000 units plus or minus 5,280 units). The average estimate of one-unit structures started during the specified month may or may not be contained in any one of these computed intervals; but for a particular sample, one can say that the average estimate from all possible samples is included in the constructed interval with a specified confidence of 90 percent.

Ranges of 90-percent confidence intervals for estimated percent changes are shown in the text. When the range of

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the confidence interval contains zero, it is unclear whether there was an increase or decrease; that is, the change is not statistically significant.

### **Nonsampling Errors**

As calculated for this report, the coefficient of variation estimates sampling variation but does not measure all nonsampling error in the data. Nonsampling error consists of both a variance component and a bias component. Bias is the difference, averaged over all possible samples of the same size and design, between the estimate and the true value being estimated. Nonsampling errors are usually attributed to many possible sources: (1) coverage error - failure to accurately represent all population units in the sample, (2) inability to obtain information about all sample cases, (3) response errors, possibly due to definitional difficulties or misreporting, (4) mistakes in recording or coding the data obtained, and (5) other errors of coverage, collection and nonresponse, response, processing, or imputing for missing or inconsistent data. These nonsampling errors also occur in complete censuses. Although no direct measures of these errors have been obtained, precautionary steps have been taken in all phases of the collection, processing, and tabulation of the data to minimize their influence.

As described in the section, "Housing Starts Compilation," a potential source of bias is the upward adjustment of 3.3 percent made to account for one-unit structures started in permit-issuing areas without permit authorization. Another source is the imputation for units started prior to permit authorization and for late reports. For the Building Permits Survey, estimates are imputed for nonresponse. The final estimates of privately owned housing units started and building permits issued are imputed less than 2 percent.

### **SEASONAL ADJUSTMENT**

Seasonal adjustment is the process of estimating and removing seasonal effects from a time series to better reveal certain non-seasonal features such as underlying trends and business cycles. Seasonal adjustment procedures estimate effects that occur in the same calendar month with similar magnitude and direction from year-to-year. In series whose seasonal effects come primarily from weather the seasonal factors are estimates of average weather effects for each month. It does not account for abnormal weather conditions or for year-to-year changes in weather. Seasonal factors are estimates based on present and past experience. Future data may show a different pattern.

The mechanics of seasonal adjustment involve breaking down a time series into trend-cycle, seasonal and irregular components.

**Trend-cycle.** The long-term tendencies of a series to grow or decline.

**Seasonal effects.** Effects that are reasonably stable in terms of timing, direction and magnitude. Possible causes include natural factors (the weather), administrative measures and social/cultural/religious traditions.

**Irregular component.** Anything not included in the trend-cycle or the seasonal effects (including trading-day or holiday effects). Its values are unpredictable as regards timing, impact, and duration. It can arise from sampling error, nonsampling error, unseasonable weather, natural disasters, strikes, etc.

Monthly time series that are totals of daily activities can be influenced by each calendar month's weekday composition. This influence is revealed when monthly values consistently depend on which days of the week occur five times in the month. For example, building permit offices are usually closed on Saturday and Sunday. Thus, the number of building permits issued in a given month is likely to be higher if the month contains a surplus of weekdays and lower if the month contains a surplus of weekend days. Recurring effects associated with individual days of the week are called trading-day effects.

Trading-day effects can make it difficult to compare time series values or to compare movements in one series with movements in another. For this reason, when estimates of trading-day effects are statistically significant, we adjust them out of the series. The removal of such estimates is referred to as trading-day adjustment.

Most of the seasonally adjusted series in this report are shown as seasonally adjusted annual rates (SAAR). The seasonally adjusted annual rate is the seasonally adjusted monthly value multiplied by 12. The benefit of the annual rate is that not only can we compare one monthly estimate with another, we can also compare monthly data to an annual total.

The seasonal adjustment indexes shown in this publication were developed using X-12-ARIMA. The X-12-ARIMA is a seasonal adjustment program developed at the U.S. Census Bureau. The program is based on the Bureau's earlier X-11 program and the X-11-ARIMA/88 program developed at Statistics Canada. For more information on X-12-ARIMA please see the X-12 website ([www.census.gov/pub/ts](http://www.census.gov/pub/ts)).

### **HOUSING STARTS**

Seasonal indexes are developed each month (concurrent adjustment) for total private housing starts, by region and type of structure. Every month, each series is run through the X-12-ARIMA program. The seasonally adjusted U.S. total is the sum of six seasonally adjusted components: single-family structures in each of the four regions, U.S. total for two-to four unit structures, and U.S. total for structures with five units or more. Also, the unadjusted data for the four regions are seasonally adjusted and modified so that the seasonally adjusted U.S. total derived from the regions equals the seasonally adjusted U.S. total derived from the structures. Note the seasonal factors for

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private housing starts shown in Table A-1 are the product of trading-day and seasonal factors. For simplicity we refer to the product factors as seasonal factors.

### **BUILDING PERMITS**

Seasonal indexes are also developed each month for region and type of structure of total housing units authorized by building permits. The seasonally adjusted building permit estimates are computed using a procedure

similar to that used for housing starts. Thus, the seasonal indexes for building permits shown in Table A-2 include trading-day adjustment.

**Table A-1. Seasonal Indexes Used to Adjust Housing Units Started**

Period	United States implicit index <sup>1</sup>	In structures with—						All units			
		1 unit				2 to 4 units	5 units or more	North-east	Midwest	South	West
		North-east	Midwest	South	West						
<b>1997<sup>a</sup></b>											
January	72.8	59.8	51.5	80.4	79.9	61.6	78.9	65.1	50.9	80.5	79.5
February	76.5	58.7	57.0	87.7	80.2	73.2	77.6	56.8	53.1	85.8	81.2
March	99.1	89.6	92.5	106.9	106.3	100.7	87.3	90.5	90.2	104.1	102.8
April	114.5	110.4	119.4	119.6	111.8	114.0	106.0	109.6	117.4	116.6	110.4
May	113.4	116.8	123.9	112.7	111.8	101.6	107.7	116.0	123.5	111.7	113.4
June	112.7	122.7	128.6	108.7	118.3	125.2	98.7	123.4	126.4	105.6	114.4
July	112.4	123.1	120.0	106.9	116.3	112.2	106.7	120.1	120.3	108.2	112.8
August	109.2	116.3	112.0	106.0	103.8	109.2	115.6	115.9	117.8	103.1	105.6
September	108.0	107.1	117.2	102.8	109.3	110.3	108.7	107.6	113.4	105.9	111.2
October	109.8	113.4	120.0	101.2	100.6	115.6	121.9	114.8	125.6	103.9	103.3
November	89.3	97.9	85.6	88.8	79.8	98.7	97.0	100.0	89.9	86.6	79.5
December	81.2	82.3	71.5	77.4	79.7	78.3	95.0	80.0	71.3	86.6	82.9
<b>1998<sup>a</sup></b>											
January	71.8	59.0	50.6	79.2	80.5	60.7	78.6	65.1	50.2	80.4	80.4
February	76.6	60.5	59.0	87.8	80.4	73.2	77.6	57.2	53.2	85.8	81.7
March	101.6	93.2	93.2	111.5	108.8	101.7	86.7	91.2	91.1	107.8	107.5
April	112.9	108.1	116.8	116.2	111.3	112.5	106.0	108.9	117.5	113.7	109.0
May	111.9	114.3	120.0	112.9	107.4	101.7	108.0	115.4	121.5	109.4	107.8
June	116.7	125.0	135.2	112.0	125.0	125.7	97.9	122.8	128.4	110.9	122.5
July	110.2	123.0	119.6	103.5	113.8	111.8	106.3	121.1	120.4	105.8	108.1
August	109.7	116.7	113.9	104.8	107.4	108.2	115.6	115.7	117.9	102.9	108.6
September	107.3	106.6	115.9	104.2	104.3	110.9	109.4	108.3	113.5	104.4	105.8
October	108.8	109.7	116.8	100.3	101.1	118.1	121.1	114.3	123.2	103.6	104.3
November	89.8	100.5	88.5	87.7	82.6	97.8	98.8	99.8	91.4	88.2	83.2
December	80.1	82.6	68.9	78.6	77.1	78.2	95.1	80.5	71.2	86.2	82.4
<b>1999<sup>a</sup></b>											
January	71.8	57.7	49.6	79.2	77.1	60.1	78.0	64.8	49.5	78.9	76.3
February	77.5	61.7	59.9	88.1	80.3	73.7	77.5	57.4	53.4	86.0	82.2
March	103.2	96.3	98.1	111.4	111.8	101.9	86.5	91.5	92.4	108.3	107.3
April	112.6	107.6	116.0	116.1	112.2	111.7	105.8	108.6	117.7	115.2	110.8
May	113.2	114.8	122.2	111.5	112.2	101.7	108.0	114.9	121.4	109.0	111.4
June	117.1	124.2	133.7	114.0	119.5	125.2	97.7	122.1	128.6	110.0	117.1
July	109.3	120.2	117.0	102.1	115.4	112.3	106.4	122.6	118.9	105.7	109.1
August	112.2	119.3	115.0	109.4	109.6	107.1	114.7	115.3	119.4	106.8	114.6
September	105.6	106.0	113.2	100.7	102.6	110.6	109.5	108.7	113.4	101.7	103.7
October	106.6	105.8	114.2	100.7	96.8	120.7	121.4	113.6	121.4	102.0	98.8
November	92.3	103.6	92.4	89.6	87.8	95.8	96.8	99.7	92.4	92.4	89.4
December	78.3	83.5	68.2	75.9	75.1	78.5	95.3	80.5	70.8	82.9	78.2
<b>2000</b>											
January <sup>p</sup>	72.3	57.2	52.4	78.4	80.0	62.0	80.4	64.2	50.3	80.0	79.4

<sup>p</sup>Preliminary. <sup>r</sup>Revised.

<sup>1</sup>The implicit seasonal index is the ratio of the unadjusted number of housing units started in the United States to the seasonally adjusted national total of housing units started. It provides an indication of the overall seasonality for the particular month.

Note: These seasonal indexes include trading-day adjustment factors.

Table A-2. **Seasonal Indexes Used to Adjust Housing Units Authorized in Permit-Issuing Places**

Period	United States implicit index <sup>1</sup>	In structures with—						All units			
		1 unit				2 to 4 units	5 units or more	North-east	Midwest	South	West
		North-east	Midwest	South	West						
<b>1997</b>											
January	76.5	64.4	51.5	88.0	78.3	73.3	81.6	68.2	53.7	88.3	80.3
February	78.1	59.9	63.3	89.6	80.7	76.4	76.4	62.9	62.5	87.7	81.4
March	100.4	91.8	99.0	106.9	105.9	98.4	91.8	92.9	97.9	103.8	103.4
April	115.9	119.0	127.9	115.7	116.6	114.7	105.9	116.5	122.2	113.3	111.2
May	111.7	122.8	127.0	111.3	112.7	106.3	97.3	116.4	121.5	108.0	106.9
June	114.4	118.6	120.7	108.8	117.6	117.0	112.7	118.5	116.3	109.6	118.6
July	111.5	122.1	121.5	109.2	113.0	106.9	103.5	118.3	116.1	106.7	112.2
August	104.4	109.4	108.9	101.0	102.1	101.2	106.7	110.0	110.5	102.7	101.4
September	107.9	108.6	112.0	101.7	104.1	109.3	116.8	108.1	114.1	105.9	108.3
October	108.5	112.6	113.9	102.4	105.7	120.8	112.0	113.4	120.2	103.6	109.7
November	82.0	88.0	81.0	78.8	77.1	88.1	89.2	89.1	85.4	80.4	77.0
December	87.7	81.9	71.1	85.5	86.0	88.3	107.9	85.4	78.5	88.8	90.5
<b>1998</b>											
January	73.2	62.5	50.6	84.8	74.9	71.0	76.8	65.9	52.0	84.1	76.7
February	77.6	60.1	63.4	89.7	80.7	76.1	76.4	63.1	63.3	87.5	81.4
March	105.3	97.2	105.0	112.2	110.3	102.1	96.2	97.9	102.4	110.6	105.7
April	114.8	115.7	126.1	115.5	116.7	113.9	103.2	113.0	121.4	112.8	112.6
May	118.3	118.3	119.5	105.0	106.8	101.4	98.1	112.3	115.3	104.6	100.8
June	120.2	126.9	129.9	115.5	123.7	122.4	114.7	125.8	122.5	113.9	124.0
July	110.2	119.5	118.5	108.0	110.9	105.0	105.4	116.4	114.1	107.6	112.8
August	104.0	107.0	108.9	101.4	104.6	103.0	103.2	108.2	111.0	100.4	103.3
September	108.4	110.8	110.6	101.3	104.8	109.7	120.2	110.7	113.4	105.1	108.7
October	104.2	109.5	111.5	98.7	100.7	116.6	105.5	109.5	116.8	99.3	104.5
November	85.2	88.8	83.8	82.3	80.5	90.2	92.3	90.6	88.6	85.0	80.9
December	87.4	82.7	71.7	86.0	86.2	90.2	106.5	85.6	79.0	89.6	89.9
<b>1999</b>											
January	71.1	60.1	47.9	80.0	71.1	67.7	77.5	64.2	49.7	81.0	72.4
February	78.3	60.3	63.7	90.0	80.7	76.0	76.4	63.5	64.0	87.6	81.6
March	110.3	101.4	108.8	117.3	116.4	106.4	99.2	102.9	106.4	112.7	113.0
April	113.8	116.7	127.0	114.6	113.1	111.0	101.4	112.3	119.9	114.4	109.5
May	106.8	114.9	119.0	105.5	109.5	101.5	93.8	108.7	115.1	101.9	103.5
June	121.0	128.0	128.2	115.3	124.5	122.1	118.7	128.5	120.8	114.7	125.4
July	106.3	115.8	115.7	104.1	106.4	101.4	100.7	110.9	109.5	103.3	107.6
August	109.2	113.4	115.5	106.0	108.7	107.5	109.2	113.5	116.0	107.1	104.9
September	106.0	106.0	109.0	99.8	104.0	108.7	116.5	105.6	112.0	103.1	108.0
October	100.2	104.6	105.4	92.9	95.1	110.9	108.3	105.0	110.6	97.6	98.0
November	90.1	95.4	90.4	87.5	84.7	98.5	95.3	97.4	95.2	88.2	84.9
December <sup>r</sup>	86.6	81.8	70.2	84.5	83.4	90.7	107.6	85.8	77.4	90.1	90.9
<b>2000</b>											
January <sup>p</sup>	70.7	60.0	48.7	80.9	73.7	66.7	75.7	65.2	51.7	79.6	75.2

<sup>p</sup>Preliminary. <sup>r</sup>Revised.

<sup>1</sup>The implicit seasonal index is the ratio of the unadjusted number of housing units authorized by building permits in the United States to the seasonally adjusted national total of housing units authorized. It provides an indication of the overall seasonality for the particular month.

Note: These seasonal indexes include trading-day adjustment factors.

Table A-3. **Average Percent Changes and Related Measures for Monthly Housing Starts and Permit Authorizations**

Series	Average percentage change				Ratio of irregular component to cyclical component (I/C)	Moving seasonality present relative to the stable seasonality (M7)	Overall quality assessment Statistics (Q)	F-test statistics for stable seasonality (F)
	Original series (O)	Seasonally adjusted series (CI)	Irregular component (I)	Cyclical component (C)				
<b>HOUSING STARTS</b>								
<b>U. S. total</b> .....	<b>11.29</b>	<b>5.25</b>	<b>5.04</b>	<b>1.23</b>	<b>4.08</b>	<b>0.14</b>	<b>0.35</b>	<b>265.93</b>
Northeast .....	22.71	15.42	15.26	1.58	9.67	0.30	0.72	68.26
Midwest.....	23.31	11.62	11.40	1.33	8.55	0.20	0.63	184.11
South.....	11.25	7.73	7.51	1.72	4.37	0.25	0.45	72.60
West .....	13.10	9.10	8.70	1.98	4.40	0.24	0.42	83.53
1 unit								
Northeast .....	23.19	10.98	10.55	2.36	4.46	0.24	0.43	120.83
Midwest.....	24.49	11.22	11.00	1.44	7.63	0.20	0.55	212.68
South.....	11.00	6.76	6.46	1.63	3.96	0.21	0.38	113.87
West .....	13.05	8.43	7.98	1.88	4.25	0.21	0.44	97.08
2 to 4 units.....	26.46	21.75	21.78	2.28	9.55	0.63	1.39	14.67
5 units or more .....	19.61	16.76	16.48	2.14	7.69	0.45	1.07	21.87
<b>PERMIT AUTHORIZATIONS</b>								
<b>U. S. total</b> .....	<b>10.86</b>	<b>3.14</b>	<b>2.76</b>	<b>1.21</b>	<b>2.29</b>	<b>0.11</b>	<b>0.21</b>	<b>399.49</b>
Northeast .....	15.77	6.86	6.28	1.97	3.19	0.17	0.41	229.66
Midwest.....	20.43	6.50	5.85	1.77	3.30	0.16	0.34	332.39
South.....	9.58	4.70	4.43	1.30	3.42	0.20	0.34	112.11
West .....	12.11	5.50	5.09	1.45	3.50	0.18	0.34	139.26
1 unit								
Northeast .....	16.44	6.00	5.61	1.75	3.21	0.14	0.29	318.24
Midwest.....	18.68	4.03	3.37	1.73	1.95	0.09	0.14	990.71
South.....	10.07	3.50	3.09	1.30	2.38	0.16	0.22	267.27
West .....	11.76	4.86	4.32	1.67	2.59	0.15	0.21	220.85
2 to 4 units.....	14.96	7.94	7.84	1.02	7.69	0.27	0.65	63.24
5 units or more .....	14.89	9.30	8.94	2.08	4.29	0.34	0.64	40.59

**Definitions of Summary Measures**

The following are brief definitions of the measures shown here. More complete explanations appear in *Electronic Computers and Business Indicators* by Julius Shiskin, issued as Occasional Paper 57 by the National Bureau of Economic Research, 1957 (reprinted from the *Journal of Business*, October 1957).

**O** is the average month-to-month (quarter-to-quarter) percentage change, without regard to sign, in the original (not seasonally adjusted) series.

**CI** is the average month-to-month (quarter-to-quarter) percentage change, without regard to sign, in the seasonally adjusted series.

**I** is the average month-to-month (quarter-to-quarter) percentage change for the irregular component, which is obtained by dividing the cyclical component into the seasonally adjusted series.

**C** is the average month-to-month (quarter-to-quarter) percentage change for the cyclical component which is a smooth, flexible moving average of the seasonally adjusted series.

**I/C** is the average relative month-to-month (quarter-to-quarter) change without regard to sign of the irregular component divided by the average relative month-to-month (quarter-to-quarter) change without regard to sign of the cyclical component. The ratio serves as an indication of the series' relative smoothness (small values) or irregularity (large values).

**M7** is a function of the F-test assessing the significance of stable seasonality and the F-test assessing the significance of moving seasonality. It is one of the 11 quality monitoring statistics that X-12-ARIMA produces. M7 may range from 0 to 3 with an acceptance range from 0 to 1.

**Q** is a weighted average of M1-M11 (quality monitoring statistics from X-12-ARIMA). An indicator of the overall quality of the adjustment. Q has an acceptance range of 0 to 1. Values from 1.0 to 1.2 may be accepted if other diagnostics indicate suitable adjustment quality.

**F** is the F-test value that measures the presence of stable seasonality, it is the quotient of two variances: (1) the between-months (between-quarters) variance, and (2) the residual variance, which is mainly due to the irregular component. Higher F values may indicate the presence of stable seasonality. Lower values may indicate a lack of stable seasonality.



## Appendix B. Monthly Revisions to Estimates

Each month the Census Bureau publishes preliminary estimates of Housing Starts and Building Permits. The Bureau releases these estimates to provide government and private data users with early measures of new privately owned residential construction activity. A necessary part of the process of issuing these early data involves the issuance of subsequent revisions. The revisions to monthly housing starts and building permit estimates are primarily the result of the replacement of imputed data with data which are reported in subsequent months.

For total housing starts, the range of the difference between the last 12 preliminary and first revision estimates for the same months was from -0.85 percent to 1.05 percent, with a median of 0.06 percent. The range of the difference between preliminary and final estimates was from -2.61 percent to 3.94 percent, with a median of 0.87 percent. The preliminary-to-final difference for total building permits over the last 12 months ranged from -0.23 percent to 1.23 percent, with a median of 0.38 percent.

### Analysis of Revisions to Monthly Seasonally Adjusted Estimates of Housing Starts and Building Permits

Series	Percent changes between estimates— last 12 months					
	First revision versus preliminary			Final versus preliminary		
	Range		Median	Range		Median
	From	To		From	To	
<b>HOUSING STARTS</b>						
<b>U.S. total</b> .....	<b>-0.85</b>	<b>1.05</b>	<b>0.06</b>	<b>-2.61</b>	<b>3.94</b>	<b>0.87</b>
In structures with-						
1 unit.....	-0.99	1.55	0.06	-2.34	4.02	0.68
2 to 4 units .....	-30.30	15.15	-7.86	-27.50	18.18	-10.53
5 units or more .....	-2.56	3.67	0.94	-3.04	6.30	2.61
Northeast.....	-1.57	5.38	-0.29	-2.00	5.38	-0.29
Midwest.....	-4.00	6.40	0.95	-4.75	9.27	0.52
South.....	-1.70	1.57	0.14	-3.44	4.26	0.90
West.....	-1.57	0.76	-0.25	-2.69	2.84	-0.24
<b>BUILDING PERMITS<sup>1</sup></b>						
<b>U.S. total</b> .....	<b>-0.23</b>	<b>1.23</b>	<b>0.38</b>	<b>-0.23</b>	<b>1.23</b>	<b>0.38</b>
In structures with-						
1 unit.....	-0.46	1.12	0.70	-0.46	1.12	0.70
2 to 4 units .....	-3.13	6.67	0.00	-3.13	6.67	0.00
5 units or more .....	-3.64	4.57	-0.14	-3.64	4.57	-0.14
Northeast.....	-1.81	1.64	-0.29	-1.81	1.64	-0.29
Midwest.....	-2.20	1.57	-0.58	-2.20	1.57	-0.58
South.....	-1.10	2.76	0.22	-1.10	2.76	0.22
West.....	-1.09	2.58	1.01	-1.09	2.58	1.01

<sup>1</sup>For the building permit series, the first revision is the final estimate.