

**Components of  
Inventory Change  
And Rental Dynamics:  
Sacramento  
1996-2004**

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# Components of Inventory Change and Rental Market Dynamics: Sacramento 1996-2004

## Overview

Components of Inventory Change (CINCH) and rental market dynamics are two techniques for explaining how changes that take place in a housing market over time came about in physical (bricks and mortar) terms. CINCH focuses first on the overall number and then the characteristics of units at different times. Using CINCH methods, analysts answer such question as: “What happened to the x units that disappeared from the housing stock between the beginning and the end of the period?” or “Where did the increase in owner-occupied units come from?” Rental market dynamics, which is really a type of CINCH analysis, focuses on the rental market with particular emphasis on the affordability of rental housing. Using rental market dynamics techniques, analysts answer such questions as: “Have the number of rental units affordable to households with very low incomes increased or decreased over the period?” or “What happened to the rental units that were affordable to low-income households at the beginning of the period?”

This report focuses on the Sacramento metropolitan housing market over the period between 1996 and 2004. It is one of 13 reports based on local American Housing Surveys conducted in 2004; these 13 metropolitan areas were previously surveyed in either 1995 or 1996.<sup>1</sup>

CINCH and rental market dynamics have both forward-looking and backward-looking components. The forward-looking component starts with the housing stock available at the beginning of the period and then, looking at the end of the period, attempts to explain what happened to those units. Possible answers include some units still exist and serve the same market, some units still exist but serve a different market, some units have been demolished or destroyed in natural disasters, or some units are being used for nonresidential purposes. The backward-looking component starts with the housing stock available at the end of the period and, looking at the beginning of the period, attempts to explain where those units came from. Possible answers include some units existed at the beginning of the period and served the same market, some units existed at the beginning of the period but served a different market, some units were newly constructed over the period, or some units were being used for nonresidential purposes at the beginning of the period. Neither CINCH nor rental market dynamics try to track the experience of a unit over the entire period; both are interested only in the beginning and the end of the period. For example, a housing unit in 1996 may have become a medical office in 1997 but returned to being a housing unit in 2000. CINCH would record this unit as having

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<sup>1</sup> See <http://www.huduser.org/datasets/cinch.html> for examples of previous CINCH and rental dynamics studies.

undergone no change over the period from 1996 to 2004. In research jargon, CINCH and rental market dynamics are *comparative static* analyses.

Ideally one would want to combine the forward-looking and backward-looking analyses to produce a complete accounting that can explain the beginning and the end consistently in terms of units that existed in both periods, losses from the stock over the period, and additions to the stock over the period. The research in this report uses the AHS, which is a sample of units at both points in time, and previous research has shown that creating sample weights that take both periods into account can generate some inconsistent or inaccurate results. For this reason, recent CINCH and rental market dynamics studies have separated the forward-looking and backward-looking components. This paper will do the same. (Weighting is explained briefly in Appendix B and more fully in a separate paper referenced in that appendix.)

The remainder of this report consists of four sections:

- An explanation of how to read the CINCH tables.
- Two sets of four tables each: a set of forward-looking tables tracing the movement of units from 1996 to 2004 and identifying how units were lost to the housing stock; and a set of backward-looking tables tracing where 2004 units came from and distinguishing between units that were part of the stock in 1996 and units that were additions to the stock since 1996.
- Two tables and accompanying discussion that highlight interesting changes in the Sacramento housing stock between 1996 and 2004.
- A brief discussion of the rental market dynamics results using CINCH-like tables.

Two appendices explain how the results were tested and how the weights were created.

### ***How to Read CINCH Tables***

Rows and columns serve different purposes in CINCH tables. The rows identify classes of units to be analyzed. The columns trace those units either forward or backward.

The forward-looking tables are concerned with what happened to the 1996 housing stock by 2004. There are three basic dispositions of 1996 units: units that continue to exist in 2004 with the same characteristics (or serving the same market), units that continue to exist in 2004 but with different characteristics (or serving a different market), and units that were lost to the stock.

The backward-looking tables are concerned with where the 2004 housing stock came from in reference to 1996. There are three basic sources of 2004 units: units that existed in 1996 with the same characteristics (or serving the same market),

units that existed in 1996 but with different characteristics (or serving a different market), and units that are additions to the housing stock.

The essence of the CINCH analysis lies in the columns because they specify the state of a unit in the other time period.

### **Columns Common to both Forward-Looking and Backward-Looking Tables:**

- The first and last columns contain the row numbers. The row numbers are identical for the same tables in the forward-looking and backward-looking sets.

Columns A through E set up the analysis and track units that exist in both periods.

- Column A specifies the characteristic that defines the subset of the stock that is being tracked forward or backward in a particular row. For example, row 2 of Table 1 focuses on occupied units; row 15 focuses on units built in 1985 through 1989.
- Column B gives the estimate published in the AHS report for the number of units that satisfy the conditions specified in column A. For example, the 1996 AHS report for Sacramento counted 557,800 occupied units (row 2, column B, forward-looking Table 1); the 2004 AHS report counted 669,400 occupied units (row 2, column B, backward-looking Table 1).
- Column C gives the CINCH estimate of the number of units that satisfy two conditions: (a) being part of the housing stock in the relevant year (1996 for the forward-looking tables and 2004 for the backward-looking tables), and (b) satisfying the condition in column A. CINCH uses different weights than those used in preparing the published AHS reports. Therefore, CINCH estimates can differ from AHS estimates for particular subsets of the housing stock. As explained in the appendix, the weights were created to match AHS published totals for rows 2 through 4 of Table 1 and rows 2 and 4 of Table 4. This perfect match will not be true of other rows.<sup>2</sup>
- Column D is the CINCH estimate of the number of units from column C that (a) are also part of the housing stock in the *other* year, and (b) continue to belong to the subset defined by column A. For example, column D of row 2 of forward-

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<sup>2</sup> Columns B and C will also match, except for rounding, in row 1 of Table 1 because row 1 is defined as the sum of rows 2 through 4. Categories for which the CINCH weights seem consistently to have trouble matching the published numbers were: the number of mobile homes, units built between 2000-2004, units built between 1995-1999, rental units that do not have a cash rent, and monthly housing costs less than \$350 for owners. In a few other cases, the weighted numbers consistently fail to match the published totals, but the authors believe the differences result because the Census Bureau created the published totals using information not available on the public use files or because of coding differences. These cases are: the reasons for incomplete plumbing and households receiving welfare or SSI payment.

looking Table 1 estimates that 514,900 of the occupied units from 1996 were also occupied in 2004.

- Column E is the CINCH estimate of the number of units from column C that (a) are also part of the housing stock in the *other* year, but (b) no longer belong to the subset defined by column A. Column E of row 2 indicates that 34,900 units that were occupied in 1996 are still part of the housing stock in 2004 but are no longer occupied. In some cases, the analysis will not allow a unit to change characteristics between the base year and the other year. Examples include type of structure, year built, and number of stories; these are characteristics that are considered impossible or unlikely to change.

### Columns Unique to Forward-Looking Tables

In forward-looking tables, columns F through K track what happened to units that were lost from 1996 to 2004.

- Column F is the CINCH estimate of the number of units from column C that are not in the 2004 housing stock because they were merged with other units or converted into multiple units. Among occupied units, 400 were lost to mergers and conversions.
- Column G is the CINCH estimate of the number of mobile homes from column C that were moved out during the period. Among occupied units, 200 mobile homes were moved out.<sup>3</sup>
- Column H is the CINCH estimate of the number of units that from column C that became nonresidential at the end of the period. For example, a real estate firm, a tax preparation office, a palm reader, or some other business might buy or rent a house to use for business rather than residential purposes.<sup>4</sup> Among occupied units, 1,600 became nonresidential.
- Column I is the CINCH estimate of the number of units from column C that were demolished or were destroyed by fires or natural disasters by 2004. In this case, 1,600 units were demolished or destroyed.
- Column J is the CINCH estimate of the number of units from column C that by 2004 were condemned or that were no longer usable for housing because of extensive damage. In Sacramento, 400 occupied units were lost because of damage or similar cause.

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<sup>3</sup> The AHS does not trace where the mobile home is moved to. The move may be within the metropolitan area or outside the metropolitan area. Similarly, column G in the backward-looking tables does not distinguish between move-ins from within or from outside the metropolitan area.

<sup>4</sup> If the owner or tenant both lives in a unit and conducts business out of the unit, the AHS considers the unit to be residential. So nonresidential means strictly no residential use.

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- Column K is the CINCH estimate of the number of units from column C that were lost by 2004 for other reasons. These include units that the Census Bureau eliminated for sampling purposes and other miscellaneous losses. Among occupied units, there were 3,700 units lost for these miscellaneous reasons.

The columns form a closed system. Column C counts the number of units tracked; columns D through K account for all the possible outcomes. Therefore, column C minus the sum of columns D through K always equals zero, except for rounding.<sup>5</sup>

## Columns Unique to Backward-Looking Tables

In backward-looking tables, columns G through K track where units came from that are part of the housing stock in 2004 but were not part of the 1996 housing stock.<sup>6</sup>

- Column G is the CINCH estimate of the number of mobile homes from column C that were moved in during the period. Among occupied units, 700 mobile homes were moved in (row 2, column G, of backward-looking Table 1).<sup>7</sup>
- Column H is the CINCH estimate of the number of units from column C that had been nonresidential in 1996. Among occupied units, 700 had been nonresidential.
- Column I is the CINCH estimate of the number of units from column C that were newly constructed between 1996 and 2004. Among occupied units, 83,100 units were newly constructed.
- Column J is the CINCH estimate of the number of units from column C that were added by 2004 by the recovery of units that had been temporarily lost to the housing stock because occupancy was prohibited in 1996, or the interior of the unit was exposed to the elements, or for reasons “not classified.” The 2004 occupied housing stock includes 1,200 recovered units.
- Column K includes units added by the Census Bureau as sample adjustments. Sample adjustments represent 4,700 occupied units in 2004.

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<sup>5</sup> The weighted numbers are rounded to the nearest 100 to match practices used by the Census Bureau in the AHS publications.

<sup>6</sup> The backward-looking tables do not contain a column F for units added through mergers and conversions. In 2004, the Census Bureau did not code the variable that would normally identify units created from mergers and conversions (REUAD=7 or 8).

<sup>7</sup> In 2004, the Census Bureau did not code the variable that would normally identify mobile home move-ins (REUAD=4). We estimated these from another variable (NOINT=13).

## Table 1

Table 1 focuses on the general housing characteristics of the stock. Row 1 provides the highest level CINCH overview of the stock. For this row, column A specifies no conditions other than being part of the stock in the relevant year.

Rows 2-4 divide the housing stock by use. By Census Bureau definition, the number of occupied non-seasonal units equals the number of households. Because households are the basis for all the analyses in Tables 2 through 4, it is important to get a good starting point for these estimates. For this reason, the weights are designed to match published AHS totals for occupied units (by owner-occupied and renter-occupied), vacant units, and seasonal units.

Rows 5-12 divide the housing stock by type of structure to see what type of units account for losses.<sup>8</sup> Column E is forced to be zero on the grounds that changes in structure types are extremely rare and that any observed changes are most likely data errors. The Census Bureau sometimes suppresses data to protect the confidentiality of respondents. For some metropolitan areas, suppression results in zero estimates for certain multiunit structures in the public data file, whereas the published tables contain estimates for these multiunit classes. In Sacramento, units in structures with 50 or more units are listed in row 10 instead of row 11 in forward-looking Table 1 because of suppression.

Rows 13-24 divide the housing stock by year built.<sup>9</sup> The published reports use the categories 1990-1994, 1995-1999, and 2000-2004; this report uses the same categories in Backward-Looking Table 1 but uses 1990-1996 for row 15 in Forward-Looking Table 1.<sup>10</sup> Column E is again forced to be zero.

Rows 25-31 and 32-36 divide the housing stock by two different measures of interior space, the number of rooms and the number of bedrooms.<sup>11</sup>

Rows 37-42 focus on multiunit structures only and divide them by number of stories. Column E is forced to be zero and, depending on the metropolitan area, the Census Bureau may suppress information, forcing some rows to be zero. For the 1996 Sacramento AHS public use file, the Census Bureau reported all units in structures with 2 or more stories in row 39 and reported no units in rows 40 through 42. The published reports contain matching data for row 37 only.

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<sup>8</sup> In general, the CINCH estimates exceed published AHS estimates for single-family detached units and fall short of the published AHS estimates for manufactured homes by roughly equal amounts.

<sup>9</sup> Rows 13 and 14 are not included in Forward-Looking Table 1, because the 1996 housing stock cannot contain units built after 1996.

<sup>10</sup> We use REUAD=3 and not year built to identify new construction. For this reason, there are units built after 1995 that are not considered new construction. Year built is obtained from the respondent and may be inaccurate.

<sup>11</sup> Because of small sample sizes in the losses and additions columns, we combined room categories that the published reports list separately.



Rows 43-44 divide the housing stock between central cities units and suburban residences to see how the observed changes vary by location. Rows 45-46 divide the housing stock by whether or not the occupants have moved in within the last 2 calendar years to see if certain units consistently have high turnover, and to see if high turnover units are more susceptible to loss.

## Table 2

This table looks at issues related to the physical quality of units. Row 1 repeats the analysis from row 2 in Table 1. All the subsequent rows are based on row 1.

Rows 2-3 look at whether the units have complete kitchens, that is, have an installed sink with piped water, a mechanical refrigerator, and built-in burners for the exclusive use of the occupants. Rows 4-5 look at whether the units have complete plumbing facilities, that is, hot and cold piped water, a flush toilet, and a bathtub or shower inside the structure for the exclusive use of the occupants. Rows 6-9 look at each of these requirements separately.<sup>12</sup> In the 1996 AHS, the published reports separate out the “exclusive use” category; in the data used for this report, these units show up in row 8. Rows 2-3, 4-5, and 6-9 separate out good units from the least desirable units based on kitchen and bath equipment.

Rows 10-15 look at how units obtain water and dispose of sewage.

Rows 16-21 look at units with severe physical problems. Rows 17-21 identify specific types of serious deficiencies. Row 16 counts the units having one or more of these deficiencies. Rows 22-27 look at units with moderate problems. Rows 23-27 identify specific types of deficiencies. Row 22 counts the units having one or more of these deficiencies.<sup>13</sup> These rows are in the analysis to answer two questions: whether poor-quality units in one year are also poor-quality units in the other year, and whether poorer quality units are more likely to be lost.

## Table 3

This table pertains to the characteristics of occupants. Row 1 repeats the analysis from row 2 in Table 1. All the subsequent rows are based on row 1. In all cases, the analysis seeks to find out how stable occupancy characteristics are over time, and what part of the market was served by units that were lost between 1996 and 2004.

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<sup>12</sup> Row 9 is not included in Forward-Looking Table 2, because the public use file does not contain the information needed to identify facilities available “for exclusive use” of the household.

<sup>13</sup> For definitions of serious and moderate problems, see pages 990 and 991 of the AHS Codebook, version 1.78, at [http://www.huduser.org/intercept.asp?loc=/Datasets/ahs/AHS\\_Codebook.pdf](http://www.huduser.org/intercept.asp?loc=/Datasets/ahs/AHS_Codebook.pdf).

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Rows 2-3 look at the age of the householder. Rows 4-5 look at whether or not the household includes children. Rows 6-11 look at the race or ethnicity of the householder.<sup>14</sup> Rows 12-14 look at three possible sources of household income.

**Table 4**

Table 4 pertains to tenure, income, and housing costs. Row 1 repeats the analysis from row 2 in Table 1. All the subsequent rows are based on row 1.

Rows 2-4 focus on tenure to see the extent to which units change tenure characteristics and whether rental or owner-occupied units are more likely to be lost.

Rows 5-10 characterize the rental stock using 6 categories based on monthly housing costs. Row 10 identifies units provided to tenants for no cash rents, e.g., units provided to maintenance or management personnel or units provided to relatives. Rows 16-20 identify owner-occupied units by total monthly housing costs.

Rows 11-15 track rental units by household income; rows 21-25 track owner-occupied units by household income.<sup>15</sup>

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<sup>14</sup> In compliance with new federal guidelines, the 2004 AHS used different categories for recording race. For 2004, this paper defined “White” as “White only”; Black as “Black only”; and “other” as all other answers.

<sup>15</sup> The published reports list more categories for both monthly housing costs and household income. This report combined categories for two reasons. First, the sample size in each metropolitan area is small, and therefore larger categories provide more stable measurement of the various types of losses and additions. Second, columns D and E track whether the units in each category remain occupied and stay in the same cost or income category. The combined categories create more interesting analysis because bigger changes in monthly housing costs or income are needed to move between broader categories.

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**Forward-Looking Table 1: Structural and Location Characteristics – All Housing Units**

	A Characteristics	B Published Numbers	C Present in 95	D 95 units present in 2004	E Changed in characteristics	F 95 units affected by conversion /merger	G 95 mobile homes moved out	H 95 units changed to nonresidential use	I 95 units lost through demolition or disaster	J 95 units badly damaged or condemned	K 95 units lost in other ways	
1	<b>Total</b>	625,400	625,400	612,900	0	600	200	1,600	3,700	600	5,700	1
	<b>Occupancy Status</b>											
2	Occupied	557,800	557,800	514,900	34,900	400	200	1,600	1,600	400	3,700	2
3	Vacant	65,100	65,100	14,100	46,600	200	0	0	2,100	200	1,900	3
4	Seasonal	2,500	2,500	900	1,500	0	0	0	0	0	100	4
	<b>Units in Structure</b>											
5	1, detached	416,700	423,300	416,300	0	200	200	1,400	2,700	400	2,000	5
6	1, attached	28,700	28,500	27,500	0	0	0	0	200	0	800	6
7	2 to 4	51,000	50,600	49,400	0	200	0	0	0	200	800	7
8	5 to 9	42,000	43,100	42,500	0	0	0	0	0	0	600	8
9	10 to 19	32,500	32,600	32,200	0	0	0	0	200	0	200	9
10	20 to 49	13,600	24,800	23,600	0	200	0	200	200	0	600	10
11	50 or more	11,100	0	0	0	0	0	0	0	0	0	11
12	Mobile Home/Trailer	29,900	22,400	21,200	0	0	0	0	400	0	800	12
	<b>Year Built</b>											
15	1990-1996	69,100	71,500	69,900	0	0	0	0	200	0	1,400	15
16	1985-1989	79,800	81,700	80,900	0	0	0	200	200	0	400	16
17	1980-1984	45,900	45,700	45,500	0	0	0	200	0	0	0	17
18	1970-1979	191,300	187,100	183,800	0	200	200	600	400	200	1,600	18
19	1960-1969	97,900	95,500	92,300	0	0	0	0	1,700	0	1,400	19
20	1950-1959	68,100	70,800	69,300	0	200	0	400	400	0	500	20
21	1940-1949	35,000	33,400	31,900	0	200	0	200	600	200	200	21
22	1930-1939	13,600	14,900	14,900	0	0	0	0	0	0	0	22
23	1920-1929	11,100	12,200	12,200	0	0	0	0	0	0	0	23
24	1919 or earlier	13,500	12,700	12,100	0	0	0	0	200	200	200	24

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**Forward-Looking Table 1 (continued): Structural and Location Characteristics – All Housing Units**

	A Characteristics	B Published Numbers	C Present in 95	D 95 units present in 2004	E Changed in characteristics	F 95 units affected by conversion /merger	G 95 mobile homes moved out	H 95 units changed to nonresidential use	I 95 units lost through demolition or disaster	J 95 units badly damaged or condemned	K 95 units lost in other ways	
	<b>Rooms</b>											
25	1 – 4 rooms	177,400	174,100	136,600	32,400	400	0	400	1,000	600	2,700	25
26	5 rooms	140,500	138,600	66,100	68,800	0	200	200	2,100	0	1,200	26
27	6 rooms	136,400	136,800	62,700	72,700	200	0	200	400	0	600	27
28	7 rooms	86,400	89,400	36,400	52,000	0	0	400	0	0	600	28
29	8 rooms	52,500	53,000	20,700	31,400	0	0	200	200	0	400	29
30	9 rooms	19,100	20,400	6,500	13,700	0	0	200	0	0	0	30
31	10 rooms or more	13,200	13,000	3,100	9,700	0	0	0	0	0	200	31
	<b>Bedrooms</b>											
32	None	5,600	5,300	3,000	1,800	0	0	0	200	0	300	32
33	1	75,000	73,900	62,100	9,600	400	0	400	400	200	800	33
34	2	183,000	178,500	147,300	27,700	0	0	200	600	400	2,400	34
35	3	251,800	256,200	214,700	36,700	200	200	200	2,300	0	1,800	35
36	4 or more	110,000	111,400	96,600	13,300	0	0	800	200	0	400	36
37	<b>Multiunit Structures</b>	150,200	151,200	147,800	0	400	0	200	400	200	2,200	37
	<b>Stories in Structures</b>											
38	1	NA	25,900	24,700	0	200	0	0	0	0	1,000	38
39	2	NA	125,300	123,100	0	200	0	200	400	200	1,200	39
40	3	NA	0	0	0	0	0	0	0	0	0	40
41	4 to 6	NA	0	0	0	0	0	0	0	0	0	41
42	7 or more	NA	0	0	0	0	0	0	0	0	0	42
	<b>Metro Status</b>											
43	In central cities	NA	159,600	157,600	0	200	0	600	800	200	200	43
44	In suburbs	NA	465,800	455,300	0	400	200	1,000	2,900	400	5,500	44
	<b>Mover Status</b>											
45	Moved in last 2 years	NA	149,600	46,200	99,900	400	0	0	800	0	2,300	45
46	Not a Recent Mover	NA	408,200	403,700	0	0	200	1,600	800	400	1,400	46

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**Forward-Looking Table 2: Condition of Unit – All Occupied Units**

	A Characteristics	B Published Numbers	C Present in 95	D 95 units present in 2004	E Changed in characteristics	F 95 units affected by conversion /merger	G 95 mobile homes moved out	H 95 units changed to nonresidential use	I 95 units lost through demolition or disaster	J 95 units badly damaged or condemned	K 95 units lost in other ways	
1	<b>Occupied Units</b>	557,800	557,800	514,900	34,900	400	200	1,600	1,600	400	3,700	1
	<b>Kitchen</b>											
2	With complete kitchen	552,200	552,900	498,300	46,600	400	200	1,600	1,600	400	3,700	2
3	Lacking complete kitchen facilities	5,600	4,900	400	4,500	0	0	0	0	0	0	3
	<b>Plumbing</b>											
4	With all plumbing facilities	551,500	551,700	507,200	36,700	400	200	1,600	1,600	400	3,500	4
5	Lack some plumbing	700	6,100	400	5,400	0	0	0	0	0	200	5
6	No hot piped water	0	0	0	0	0	0	0	0	0	0	6
7	No bathtub/shower	700	600	400	200	0	0	0	0	0	0	7
8	No flush toilet	5,600	6,100	400	5,400	0	0	0	0	0	200	8
	<b>Water</b>											
10	Public/private water	521,500	518,200	476,800	35,100	400	0	1,600	1,000	200	2,900	10
11	Well	34,800	38,000	30,100	6,100	0	200	0	600	200	800	11
12	Other water source	1,500	1,600	200	1,400	0	0	0	0	0	0	12
	<b>Sewer</b>											
13	Public sewer	489,400	489,600	449,600	34,500	400	0	1,600	800	200	2,500	13
14	Septic tank/cesspool	68,400	68,200	56,200	9,500	0	200	0	800	200	1,200	14
15	Other or none	0	0	0	0	0	0	0	0	0	0	15
	<b>Severe Problems</b>											
16	<b>Severe Problems</b>	9,700	9,500	400	8,900	0	0	0	0	0	200	16
17	Plumbing	6,300	6,100	400	5,400	0	0	0	0	0	200	17
18	Heating	2,100	2,800	0	2,800	0	0	0	0	0	0	18
19	Electric	300	600	0	600	0	0	0	0	0	0	19
20	Upkeep	1,200	400	0	400	0	0	0	0	0	0	20
21	Hallways	0	0	0	0	0	0	0	0	0	0	21
	<b>Moderate problems</b>											
22	<b>Moderate problems</b>	20,100	18,500	800	17,500	0	0	0	0	0	200	22
23	Plumbing	2,200	2,600	0	2,600	0	0	0	0	0	0	23
24	Heating	4,300	4,300	0	4,300	0	0	0	0	0	0	24
25	Kitchen	4,400	4,900	400	4,500	0	0	0	0	0	0	25
26	Upkeep	10,400	8,700	0	8,500	0	0	0	0	0	200	26
27	Hallways	200	200	0	200	0	0	0	0	0	0	27

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**Forward-Looking Table 3: Household Characteristics – All Occupied Units**

	A Characteristics	B Published Numbers	C Present in 95	D 95 units present in 2004	E Changed in characteristics	F 95 units affected by conversion /merger	G 95 mobile homes moved out	H 95 units changed to nonresidential use	I 95 units lost through demolition or disaster	J 95 units badly damaged or condemned	K 95 units lost in other ways	
1	<b>Occupied units</b>	557,800	557,800	514,900	34,900	400	200	1,600	1,600	400	3,700	1
	<b>Age of Householder</b>											
2	Under 65	448,600	451,000	374,700	69,500	200	0	1,600	1,400	400	3,100	2
3	65 or older	109,100	106,800	59,400	46,100	200	200	0	200	0	600	3
	<b>Children</b>											
4	Some	213,100	217,300	110,100	103,500	200	0	600	1,000	0	1,800	4
5	None	344,600	340,500	241,000	95,200	200	200	1,000	600	400	1,800	5
	<b>Race/Origin of Householder</b>											
6	White	447,300	446,400	363,600	75,800	400	200	1,000	1,400	400	3,500	6
7	Hispanic	38,600	39,400	15,700	23,400	0	0	0	200	0	200	7
8	NonHispanic	408,700	407,000	306,400	94,000	400	200	1,000	1,200	400	3,300	8
9	Black	40,400	42,700	17,700	24,600	0	0	200	0	0	200	9
10	Other	70,100	68,700	25,000	43,100	0	0	400	200	0	0	10
11	Total Hispanics	58,800	58,700	27,200	30,900	0	0	0	400	0	200	11
	<b>Income Source</b>											
12	Wages and salaries	424,800	428,100	336,600	85,800	200	0	1,400	1,200	0	2,900	12
13	Welfare or SSI	161,800	160,700	85,200	73,400	200	200	400	200	200	800	13
14	Social security or pension	56,900	56,800	5,100	50,100	0	0	400	600	0	600	14

Components of Inventory Change and Rental Market Dynamics:  
Sacramento 1996–2004

**Forward-Looking Table 4: Market Dynamics and Affordability – All Occupied Units**

	A Characteristics	B Published Numbers	C Present in 95	D 95 units present in 2004	E Changed in characteristics	F 95 units affected by conversion /merger	G 95 mobile homes moved out	H 95 units changed to nonresidential use	I 95 units lost through demolition or disaster	J 95 units badly damaged or condemned	K 95 units lost in other ways	
1	<b>Occupied units</b>	557,800	557,800	514,900	34,900	400	200	1,600	1,600	400	3,700	1
	<b>Tenure</b>											
2	Owner occupied	344,700	344,700	300,500	40,700	0	200	800	400	400	1,600	2
3	Percent own occpd	61.8%	61.8%									3
4	Renter occupied	213,100	213,100	145,900	62,700	400	0	800	1,200	0	2,000	4
	<b>Renter Monthly Housing Costs</b>											
5	Less than \$350	18,400	19,500	4,900	14,400	0	0	0	200	0	0	5
6	\$350 to \$599	88,900	90,900	11,200	77,500	400	0	600	600	0	600	6
7	\$600 to \$799	58,600	57,000	5,100	50,400	0	0	200	200	0	1,000	7
8	\$800 to \$1,249	37,000	38,900	9,100	29,200	0	0	0	200	0	400	8
9	\$1,250 or more	3,100	0	0	0	0	0	0	0	0	0	9
10	No cash rent	7,000	6,900	1,600	5,300	0	0	0	0	0	0	10
	<b>Renter Hsd Income</b>											
11	Less than \$15,000	56,200	55,400	11,000	42,800	200	0	400	800	0	200	11
12	\$15,000 to \$29,999	72,800	72,800	15,400	55,600	200	0	400	200	0	1,000	12
13	\$30,000 to \$49,999	48,200	48,200	8,500	39,100	0	0	0	0	0	600	13
14	\$50,000 to \$99,999	31,600	32,500	6,900	25,100	0	0	0	200	0	200	14
15	\$100,000 or more	4,100	4,300	0	4,300	0	0	0	0	0	0	15
	<b>Owner Monthly Housing Costs</b>											
16	Less than \$350	79,300	77,500	21,800	54,800	0	200	0	0	200	400	16
17	\$350 to \$599	47,600	48,000	12,900	34,400	0	0	0	200	200	200	17
18	\$600 to \$799	32,000	34,400	4,700	29,700	0	0	0	0	0	0	18
19	\$800 to \$1,249	92,700	93,500	23,600	68,900	0	0	400	200	0	400	19
20	\$1,250 or more	93,100	91,400	64,600	25,800	0	0	400	0	0	600	20
	<b>Owner Hsd Income</b>											
21	Less than \$15,000	29,700	28,500	5,500	22,200	0	200	0	0	400	200	21
22	\$15,000 to \$29,999	61,100	59,500	12,800	46,400	0	0	0	0	0	200	22
23	\$30,000 to \$49,999	73,100	72,300	15,500	56,400	0	0	200	0	0	200	23
24	\$50,000 to \$99,999	129,800	133,300	51,500	80,800	0	0	200	400	0	400	24
25	\$100,000 or more	50,900	51,000	28,200	21,800	0	0	400	0	0	600	25

Components of Inventory Change and Rental Market Dynamics:  
Sacramento 1996–2004

**Backward-Looking Table 1: Structural and Location Characteristics – All Housing Units**

	A Characteristics	B Published Numbers	C Present in 2004	D 04 units present in 95	E Changed in characteristics	G 04 mobile homes moved in	H 04 units derived from nonresidential use	I 04 units added through new construction	J 04 units added from temporary losses	K 04 units added by other means	
1	<b>Total</b>	727,500	727,500	627,600	0	900	1,000	90,800	1,600	5,700	1
	<b>Occupancy Status</b>										
2	Occupied	669,400	669,500	530,200	48,900	700	700	83,100	1,200	4,700	2
3	Vacant	53,300	53,300	13,500	30,600	100	300	7,600	400	700	3
4	Seasonal	4,700	4,700	900	3,400	0	0	100	0	200	4
	<b>Units in Structure</b>										
5	1, detached	495,300	507,100	429,000	0	200	500	73,200	800	3,400	5
6	1, attached	32,000	31,300	29,900	0	0	100	800	100	300	6
7	2 to 4	49,000	50,400	47,700	0	0	100	1,700	200	700	7
8	5 to 9	41,200	39,900	34,500	0	0	0	5,100	0	300	8
9	10 to 19	32,200	31,000	26,700	0	0	0	4,300	0	0	9
10	20 to 49	18,400	17,600	14,800	0	0	0	2,300	300	200	10
11	50 or more	23,200	24,600	21,500	0	0	200	2,800	0	100	11
12	Mobile Home/Trailer	36,300	25,600	23,500	0	700	0	600	200	700	12
	<b>Year Built</b>										
13	2000-2004	84,300	70,300	3,800	0	400	200	66,000	0	0	13
14	1995-1999	50,300	42,200	19,700	0	0	200	21,700	100	500	14
15	1990-1994	63,000	65,200	62,000	0	0	100	3,000	0	200	15
16	1985-1989	86,400	91,600	90,100	0	200	0	0	200	1,200	16
17	1980-1984	50,400	51,300	50,400	0	200	100	0	200	400	17
18	1970-1979	156,500	157,100	155,500	0	100	200	0	200	1,200	18
19	1960-1969	96,400	101,500	100,100	0	0	0	200	500	700	19
20	1950-1959	71,600	75,400	74,300	0	0	0	0	200	900	20
21	1940-1949	34,200	36,100	35,500	0	0	200	0	0	500	21
22	1930-1939	14,600	16,000	16,000	0	0	0	0	0	0	22
23	1920-1929	11,600	12,300	12,300	0	0	0	0	0	0	23
24	1919 or earlier	8,000	8,500	8,000	0	0	0	0	300	200	24



Components of Inventory Change and Rental Market Dynamics:  
Sacramento 1996–2004

**Backward-Looking Table 1 (continued): Structural and Location Characteristics – All Housing Units**

	A Characteristics	B Published Numbers	C Present in 2004	D 04 units present in 95	E Changed in characteristics	G 04 mobile homes moved in	H 04 units derived from nonresidential use	I 04 units added through new construction	J 04 units added from temporary losses	K 04 units added by other means	
	<b>Rooms</b>										
25	1 – 4 rooms	193,700	189,600	137,000	34,900	400	300	13,300	800	2,900	25
26	5 rooms	158,000	157,300	67,700	72,100	300	300	15,000	500	1,300	26
27	6 rooms	154,900	157,600	64,800	75,800	0	0	15,600	300	1,000	27
28	7 rooms	98,300	101,200	37,900	48,800	0	200	14,200	0	200	28
29	8 rooms	64,500	64,600	21,600	29,700	0	200	12,900	0	200	29
30	9 rooms	32,400	32,500	6,700	15,500	0	0	10,200	0	0	30
31	10 rooms or more	25,700	24,800	3,100	12,000	200	0	9,500	0	0	31
	<b>Bedrooms</b>										
32	None	5,000	4,900	3,000	1,600	0	0	0	0	300	32
33	1	81,200	80,100	62,100	8,100	400	0	7,100	700	1,800	33
34	2	187,800	183,700	149,000	18,200	300	500	13,700	300	1,700	34
35	3	281,400	284,900	221,800	31,200	0	300	29,200	700	1,700	35
36	4 or more	172,100	173,900	100,300	32,200	200	200	40,900	0	200	36
37	<b>Multiunit Structures</b>	164,000	163,500	145,100	0	0	300	16,300	500	1,300	37
	<b>Stories in Structures</b>										
38	1	NA	24,800	22,400	0	0	0	1,800	0	700	38
39	2	NA	122,900	112,300	0	0	300	9,200	500	600	39
40	3	NA	11,700	6,900	0	0	0	4,900	0	0	40
41	4 to 6	NA	2,200	1,800	0	0	0	400	0	0	41
42	7 or more	NA	1,800	1,800	0	0	0	0	0	0	42
	<b>Metro Status</b>										
43	In central cities	NA	174,900	160,900	0	500	500	12,000	800	200	43
44	In suburbs	NA	552,600	466,600	0	300	500	78,800	800	5,500	44
	<b>Mover Status</b>										
45	Moved in last 2 years	NA	167,700	38,200	91,700	200	300	35,600	700	1,000	45
46	Not a Recent Mover	NA	501,800	327,700	121,500	500	300	47,500	500	3,600	46

Components of Inventory Change and Rental Market Dynamics:  
Sacramento 1996–2004

**Backward-Looking Table 2: Condition of Unit – All Occupied Units**

	A Characteristics	B Published Numbers	C Present in 2004	D 04 units present in 95	E Changed in characteristics	G 04 mobile homes moved in	H 04 units derived from nonresidential use	I 04 units added through new construction	J 04 units added from temporary losses	K 04 units added by other means	
1	<b>Occupied Units</b>	669,400	669,500	530,200	48,900	700	700	83,100	1,200	4,700	1
	<b>Kitchen</b>										
2	With complete kitchen	652,500	653,100	513,400	50,700	500	700	82,300	1,000	4,500	2
3	Lacking complete kitchen facilities	17,000	16,400	400	14,700	200	0	800	200	200	3
	<b>Plumbing</b>										
4	With all plumbing facilities	666,300	666,000	522,300	53,500	700	700	83,100	1,200	4,500	4
5	Lack some plumbing	3,200	3,500	400	2,900	0	0	0	0	200	5
6	No hot piped water	400	400	0	200	0	0	0	0	200	6
7	No bathtub/shower	600	600	400	0	0	0	0	0	200	7
8	No flush toilet	800	800	400	200	0	0	0	0	200	8
9	No exclusive use	2,800	2,700	0	2,700	0	0	0	0	0	9
	<b>Water</b>										
10	Public/private water	631,900	626,100	490,700	51,900	700	200	79,000	1,000	2,600	10
11	Well	35,600	41,700	31,300	4,200	0	500	3,900	0	1,700	11
12	Other water source	2,000	1,700	200	800	0	0	200	200	400	12
	<b>Sewer</b>										
13	Public sewer	596,500	592,800	462,500	50,100	700	200	77,100	800	1,400	13
14	Septic tank/cesspool	72,800	76,500	58,400	8,200	0	500	6,000	400	3,100	14
15	Other	200	200	0	0	0	0	0	0	200	15
	<b>Severe Problems</b>										
16	<b>Severe Problems</b>	7,100	7,600	400	6,800	0	0	0	0	300	16
17	Plumbing	3,200	3,500	400	2,900	0	0	0	0	200	17
18	Heating	4,400	4,700	0	4,600	0	0	0	0	200	18
19	Electric	0	0	0	0	0	0	0	0	0	19
20	Upkeep	0	0	0	0	0	0	0	0	0	20
21	Hallways	0	0	0	0	0	0	0	0	0	21
	<b>Moderate problems</b>										
22	<b>Moderate problems</b>	22,300	22,100	800	19,500	200	0	1,200	300	200	22
23	Plumbing	1,300	1,400	0	1,300	0	0	200	0	0	23
24	Heating	1,100	1,400	0	1,300	0	0	0	0	200	24
25	Kitchen	16,400	16,400	400	14,700	200	0	800	200	200	25
26	Upkeep	3,200	3,900	0	3,700	0	0	200	0	0	26
27	Hallways	600	600	0	400	0	0	0	200	0	27

Components of Inventory Change and Rental Market Dynamics:  
Sacramento 1996–2004

**Backward-Looking Table 3: Household Characteristics – All Occupied Units**

	<b>A</b> Characteristics	<b>B</b> Published Numbers	<b>C</b> Present in 2004	<b>D</b> 04 units present in 95	<b>E</b> Changed in characteristics	<b>G</b> 04 mobile homes moved in	<b>H</b> 04 units derived from nonresidential use	<b>I</b> 04 units added through new construction	<b>J</b> 04 units added from temporary losses	<b>K</b> 04 units added by other means	
1	<b>Occupied units</b>	669,400	669,500	530,200	48,900	700	700	83,100	1,200	4,700	1
	<b>Age of Householder</b>										
2	Under 65	543,900	545,100	385,300	82,600	700	700	71,100	1,200	3,600	2
3	65 or older	125,500	124,400	61,500	49,800	0	0	12,100	0	1,000	3
	<b>Children</b>										
4	Some	247,200	249,200	113,400	94,800	0	300	38,600	700	1,400	4
5	None	422,300	420,300	248,300	122,600	700	300	44,600	500	3,300	5
	<b>Race/Origin of Householder</b>	0									
6	White	529,800	531,200	375,300	86,100	500	500	63,700	700	4,300	6
7	Hispanic	76,700	77,900	16,000	55,700	0	200	5,500	200	300	7
8	Non-Hispanic	453,100	453,300	316,700	73,000	500	300	58,200	500	4,000	8
9	Black	47,500	47,700	18,100	24,900	0	0	4,500	200	0	9
10	Other	92,100	90,700	29,100	45,600	200	200	14,900	300	400	10
11	Total Hispanics	90,900	92,100	28,000	57,000	0	200	6,300	300	300	11
	<b>Income Source</b>										
12	Wages and salaries	526,800	527,000	312,800	139,500	500	500	69,200	800	3,600	12
13	Welfare or SSI	179,200	180,500	88,500	72,200	0	0	18,000	300	1,400	13
14	Social security or pension	47,100	21,100	5,100	14,900	0	0	600	300	200	14

Components of Inventory Change and Rental Market Dynamics:  
Sacramento 1996–2004

**Backward-Looking Table 4: Market Dynamics and Affordability – All Occupied Units**

	<b>A</b> Characteristics	<b>B</b> Published Numbers	<b>C</b> Present in 2004	<b>D</b> 04 units present in 95	<b>E</b> Changed in characteristics	<b>G</b> 04 mobile homes moved in	<b>H</b> 04 units derived from nonresidential use	<b>I</b> 04 units added through new construction	<b>J</b> 04 units added from temporary losses	<b>K</b> 04 units added by other means	
1	<b>Occupied units</b>	669,400	669,500	530,200	48,900	700	700	83,100	1,200	4,700	1
	<b>Tenure</b>										
2	Owner occupied	450,600	450,600	313,800	66,200	700	200	66,600	400	2,800	2
3	Percent own occpd	67.3%	67.3%								3
4	Renter occupied	218,900	218,900	146,000	53,100	0	500	16,500	800	1,800	4
	<b>Renter Monthly Housing Costs</b>										
5	Less than \$350	13,300	14,100	4,900	7,700	0	200	1,300	0	0	5
6	\$350 to \$599	21,400	21,900	11,200	9,700	0	0	500	0	500	6
7	\$600 to \$799	54,600	55,100	5,100	48,100	0	200	1,300	200	300	7
8	\$800 to \$1,249	86,300	87,700	9,100	72,000	0	0	5,700	700	200	8
9	\$1,250 or more	34,600	33,700	0	25,900	0	200	6,900	0	700	9
10	No cash rent	8,800	6,400	1,600	3,900	0	0	800	0	200	10
	<b>Renter Hsd Income</b>										
11	Less than \$15,000	39,200	38,100	11,000	25,000	0	0	1,800	0	300	11
12	\$15,000 to \$29,999	51,600	53,300	15,400	33,500	0	300	2,900	700	500	12
13	\$30,000 to \$49,999	61,100	61,100	8,500	49,100	0	0	3,100	0	300	13
14	\$50,000 to \$99,999	56,000	56,200	6,900	41,700	0	200	6,700	200	500	14
15	\$100,000 or more	11,100	10,300	0	8,100	0	0	2,000	0	200	15
	<b>Owner Monthly Housing Costs</b>										
16	Less than \$350	59,200	50,300	22,800	23,100	400	0	2,700	200	1,200	16
17	\$350 to \$599	65,700	66,800	13,500	45,100	200	0	7,600	0	400	17
18	\$600 to \$799	28,800	29,100	4,900	21,300	0	0	2,900	0	0	18
19	\$800 to \$1,249	80,200	78,600	24,600	47,600	0	0	6,400	0	0	19
20	\$1,250 or more	216,900	225,700	67,400	109,600	200	200	46,900	200	1,200	20
	<b>Owner Hsd Income</b>										
21	Less than \$15,000	32,700	32,300	5,700	23,600	200	0	2,000	200	500	21
22	\$15,000 to \$29,999	47,300	45,600	13,400	28,600	0	0	3,300	0	400	22
23	\$30,000 to \$49,999	83,200	83,400	16,200	58,300	200	0	7,500	200	1,100	23
24	\$50,000 to \$99,999	162,000	162,400	53,800	82,000	200	0	25,900	0	500	24
25	\$100,000 or more	125,400	127,000	29,500	68,900	200	200	27,900	0	400	25

## **Changes in the Sacramento Housing Stock: 1996-2004**

Forward-looking Table 5 looks at how losses affected certain portions of the Sacramento housing stock. The rows were selected because of their inherent interest or because an examination of losses in all 13 metropolitan areas showed that these categories typically had high loss rates. In most cases, if a category had a high loss rate, then a category with the opposite characteristic would have a low loss rate, e.g., units with 1-4 rooms and units with 10 or more rooms.

**Forward-Looking Table 5: Selected Loss Rates**

Category	Based on Columns in Tables 1-4		
	All Losses 1996-2004 (F+G+H+I+J+K)/C	Permanent Losses (I/C)	Potentially Reversible Losses (F+G+H+J+K)/C
<b>All units<sup>16</sup></b>	2.0%	0.6%	1.4%
Vacant units	6.8%	3.2%	3.5%
Units in structures with 2-4 units	2.4%	0.0%	2.4%
Units in structures with 5-9 units	1.4%	0.0%	1.4%
Mobile homes/trailers	5.4%	1.8%	3.6%
Units built 1930-1939	0.0%	0.0%	0.0%
Units built 1920-1929	0.0%	0.0%	0.0%
Units built in 1919 or earlier	4.7%	1.6%	3.1%
Units with 1-4 rooms	2.9%	0.6%	2.4%
Units with no bedrooms	9.4%	3.8%	5.7%
Units in central cities	1.3%	0.5%	0.8%
Units outside of central city	2.2%	0.6%	1.6%
<b>Occupied units<sup>17</sup></b>	1.4%	0.3%	1.1%
Units with severe problems	2.1%	0.0%	2.1%
Units with moderate problems	1.1%	0.0%	1.1%
Units with a White householder	1.5%	0.3%	1.2%
Units with a Black householder	0.9%	0.0%	0.9%
Units with Hispanic householder	1.0%	0.7%	0.3%
Household receives welfare/SSI	2.8%	1.1%	1.8%
Owner-occupied units	1.0%	0.1%	0.9%
Renter-occupied units	2.1%	0.6%	1.5%
Renter-occupied – monthly housing costs less than \$350	1.0%	1.0%	0.0%
Renter-occupied – household income less than \$15,000	2.9%	1.4%	1.4%

<sup>16</sup> All the rows above “Occupied units” refer to portions of the entire housing stock.

<sup>17</sup> All the rows below “Occupied units” refer to portions of the occupied housing stock.

By 2004, 2.0 percent of the units in the 1996 housing stock was no longer part of the housing stock; 0.6 percent were permanent losses—that is, the units had either been demolished or destroyed by fire or natural disasters—while 1.4 percent were lost in ways that could be reversed, such as nonresidential use.

Units that were vacant in 1996 had a loss rate more than 3 times greater than the overall loss rate. Units in 2-4 unit structures and mobile homes also had higher than average loss rates. There were very few losses from units built prior to 1940. Smaller units had higher than average loss rates. Of the 13 metropolitan areas studied, Sacramento and Oklahoma City were the only two areas where the loss rate outside the central city was higher than the central city loss rate.

Among units occupied in 1996, 1.4 percent were lost by 2004. The loss rate was higher than average for units with severe physical problems, but not for units with moderate physical problems. None of the losses among units with physical problems were permanent losses. There were very few losses among units occupied by Black or Hispanic householders, but the loss rate for those occupied by White householders was slightly higher than average. Units with households on welfare or SSI had higher than average loss rates. The loss rate among rental units was twice the loss rate among owner-occupied units.

Backward-looking Table 5 presents addition rates for selected areas of the Sacramento housing stock. The rows were selected because of their inherent interest or because an examination of additions in all 13 metropolitan areas showed that these categories typically had high addition rates. In most cases, if a category had a high addition rate, then a category with the opposite characteristic would have a low addition rate, e.g., units with 10 or more rooms and units with no bedrooms.

Of all the units in the Sacramento housing stock in 2004, 13.7 percent were not in the 1996 housing stock. Most of the new units came from new construction; the return to the housing stock of units that were not available in 1996 accounted for a small percentage of the total units in 2004.

Single units in attached structures and mobile homes had lower than average addition rates. Among the structure type categories, single units in detached structures (15.4 percent) and units in structures with 20 to 49 units (15.9 percent) had the highest addition rates. Large units had high addition rates, while units with no bedrooms had a low addition rate. The addition rate in central cities was slightly more than one-half of the addition rate in the rest of the metropolitan area.

New construction formed a higher proportion of the units occupied by White householders than the proportions occupied by Black or Hispanic householders. There were a substantial number of additions in both the owner-occupied and renter-occupied stock, but the owner-occupied stock had a higher percentage of additions. The addition rates were higher than average for owner-occupied units with monthly housing costs

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greater than \$1,250 and owner-occupied units with households with income of \$100,000 or more.

**Backward-Looking Table 5: Selected Addition Rates**

Category	Based on Columns in Tables 1-4		
	All Additions (G+H+I+J+K)/C	New Construction I/C	Other Additions G+H+J+K/C
<b>All units</b> <sup>18</sup>	13.7%	12.5%	1.3%
Single-unit, attached structure	4.2%	2.6%	1.6%
Mobile homes/trailers	8.6%	2.3%	6.3%
Units with 9 rooms	31.4%	31.4%	0.0%
Units with 10 or more rooms	39.1%	38.3%	0.8%
Units with no bedrooms	6.1%	0.0%	6.1%
Units in central cities	8.0%	6.9%	1.1%
Units outside of central city	15.5%	14.3%	1.3%
<b>Occupied units</b> <sup>19</sup>	13.5%	12.4%	1.1%
Units with a white householder	13.1%	12.0%	1.1%
Units with a Black householder	9.9%	9.4%	0.4%
Units with Hispanic householder	7.7%	6.8%	0.9%
Owner-occupied units	15.7%	14.8%	0.9%
Renter-occupied units	9.0%	7.5%	1.4%
Renter-occupied – monthly housing costs \$800 to \$1,249	7.5%	6.5%	1.0%
Owner-occupied – monthly housing costs \$1,250 or more	21.6%	20.8%	0.8%
Owner-occupied – household income \$100,000 or more	22.6%	22.0%	0.6%

### **Rental Market Dynamics**

Tables A and B present the rental market dynamics analysis. Rental market dynamics differs from the analysis in rows 5-10 in the forward-looking and backward-looking tables in two ways. First, rental market dynamics uses categories (rows) based on affordability instead of absolute dollar amount. Affordability is defined relative to local area median income measured at the same time that monthly housing costs are measured. Tables A and B use the following seven categories:

- Non-market (either no cash rent or a subsidized rent).
- Extremely low rent (monthly housing costs affordable to renters with incomes less than or equal to 30 percent of local area median income).<sup>20</sup>

<sup>18</sup> All the rows above “Occupied units” refer to portions of the entire housing stock.

<sup>19</sup> All the rows below “Occupied units” refer to portions of the occupied housing stock.

<sup>20</sup> “Affordable” is defined as monthly housing costs less than or equal to 30 percent of the highest income in the category.

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**Table A: Forward-Looking Rental Dynamics Analysis, Counts: 1996-2004**

Affordability Groups	A Total in 1996	B Non- Market in 2004	C Extremely Low Rent in 2004	D Very Low Rent in 2004	E Low Rent in 2004	F Moderate Rent in 2004	G High Rent in 2004	H Very or Extremely High Rent in 2004	I Owner Occupied in 2004	J Seasonal or Vacant in 2004	K Lost to Stock in 2004
<b>Non-market</b>	25,700	5,800	2,600	3,900	3,200	1,200	400	600	4,100	3,200	600
<b>Extremely Low Rent</b>	6,900	800	1,600	2,000	200	400	0	200	800	600	200
<b>Very Low Rent</b>	77,300	2,000	3,200	37,100	15,800	2,800	0	400	5,700	8,900	1,200
<b>Low Rent</b>	36,900	800	1,200	6,900	8,700	7,700	1,400	200	6,700	2,200	1,000
<b>Moderate Rent</b>	48,900	1,000	200	1,000	6,100	14,600	3,200	600	16,400	4,700	1,000
<b>High Rent</b>	17,000	0	0	400	200	1,400	3,200	2,400	7,700	1,200	400
<b>Very or Extremely High Rent</b>	400	0	0	0	0	0	0	0	400	0	0
<b>Total</b>	213,100	10,500	8,900	51,300	34,300	28,200	8,300	4,500	41,800	20,900	4,500

**Table B: Backward-Looking Rental Dynamics Analysis, Counts: 2004-1996**

Affordability Groups	A Total in 2004	B Non- Market in 1996	C Extremely Low Rent in 1996	D Very Low Rent in 1996	E Low Rent in 1996	F Moderate Rent in 1996	G High Rent in 1996	H Very or Extremely High Rent in 1996	I Owner Occupied in 1996	J Seasonal or Vacant in 1996	K New Construc- tion	L Other Additions
<b>Non-market</b>	19,400	5,800	800	2,000	800	1,000	0	0	4,300	2,800	1,700	200
<b>Extremely Low Rent</b>	13,300	2,600	1,600	3,200	1,200	200	0	0	1,200	1,400	1,400	300
<b>Very Low Rent</b>	67,500	3,900	2,000	37,100	6,900	1,000	400	0	3,500	10,500	1,200	1,000
<b>Low Rent</b>	44,300	3,200	200	15,800	8,700	6,100	200	0	3,200	4,700	1,400	700
<b>Moderate Rent</b>	43,200	1,200	400	2,800	7,700	14,600	1,400	0	5,500	4,700	4,600	200
<b>High Rent</b>	19,200	400	0	0	1,400	3,200	3,200	0	5,700	2,000	2,900	300
<b>Very or Extremely High Rent</b>	12,100	600	200	400	200	600	2,400	0	3,200	400	3,400	500
<b>Total</b>	218,900	17,800	5,300	61,500	27,000	26,800	7,700	0	26,600	26,500	16,500	3,200



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- Very low rent (monthly housing costs affordable to renters with incomes greater than 30 percent but less than or equal to 50 percent of local area median income).
- Low rent (monthly housing costs affordable to renters with incomes greater than 50 percent but less than or equal to 60 percent of local area median income).
- Moderate rent (monthly housing costs affordable to renters with incomes greater than 60 percent but less than or equal to 80 percent of local area median income).
- High rent (monthly housing costs affordable to renters with incomes greater than 80 percent but less than or equal to 100 percent of local area median income).
- Very high rent or extremely high rent (monthly housing costs affordable to renters with incomes greater than 100 percent of local area median income).<sup>21</sup>

The second difference is that rental market dynamics uses different columns in order to highlight changes in availability and affordability. Columns A through H duplicate the rows so that one can trace how rental units change their affordability status. Columns I and J track movement into or out of the owner-occupied stock or the seasonal or vacant stock, respectively. In Table A, the various types of losses are combined in column K, while, in Table B, new construction is recorded in column K and all other additions in column L.

Table A shows that there were 213,100 rental units in the Sacramento metropolitan area in 1996. In 2004, 67,200 of those units were no longer rental; 41,800 were owner-occupied, 20,900 were either vacant or being used seasonally, and 4,500 had been lost to the stock. Taken as a proportion of the units in 1996, movement into owner-occupancy was highest among units in the three highest rent categories, and losses to the stock were fairly even across the various affordability categories.

Table B shows there were 218,900 rental units in the Sacramento metropolitan area in 2004, of which 72,800 were not rental units in 1996. The new units came from units that had been owner-occupied (26,600), units that had been vacant or in seasonal use (26,500), newly constructed units (16,500), and other additions (3,200). Except for the extremely low rent category, the formerly owner-occupied units were spread fairly evenly across all the affordability categories; most of the newly constructed rental units went to the three highest rent categories.

Looking at both tables, we see that the overall number of rental units increased by approximately 5,000 units. The number of extremely low rent and very low rent units combined declined from approximately 85,000 in 1996 to over 80,000 in 2004.

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<sup>21</sup> Ideally this final category would be two separate categories with a boundary of 120 percent of local area median income. However, the Census Bureau uses top coding of variables to prevent data users from being able to identify specific units. At the metropolitan area level, top coding of the variables used to calculate housing costs results in monthly housing costs never exceeding the 120-percent boundary in one or both years.

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The totals conceal considerable movement into and out of the rental market. The gross flows sum to 140,000 units. Tables A and B also show that there was considerable movement by individual units across the affordability categories. The net effect of the gross flows into and out of the rental stock and the movement across affordability categories was a 2.7-percent increase in all rental units, and a 4.0-percent decline in the number of units affordable to the lowest income renters. Among the 13 metropolitan areas studied, only Sacramento and Cleveland suffered an absolute decline in the number of units in the extremely low rent and very low rent categories.

## ***Appendix A – Internal and External Checks***

For the CINCH analysis, we performed two tests of internal consistency:

- For each row, we tested whether the sum of possible outcomes (columns D through K) equaled the number of units present in the base year (column C). In every case, exact equality was achieved prior to rounding.
- Throughout the tables, various sets of rows are related to each other. For example, the year-built rows (13-24) in Table 1 are a disaggregation of the total stock in row 1. Similarly, rows 6 (Whites), 9 (Blacks), and 10 (Other race) in Table 3 are a disaggregation of row 1 (occupied households). In these cases, there should be equality between the parent row and the sum of the break-out rows for all columns except D and E. The difference between column D in the parent row and the sum of column D for the break-out rows should equal the negative of the difference between column E in the parent row and the sum of column E for the break-out rows. In every case, exact equality was achieved prior to rounding.

Column B provides an external check of how well the CINCH weighting performed. In general, the CINCH estimates are within 5 percent of the AHS published totals, and many of the CINCH estimates are very close to the AHS estimates. Footnote 2 indicates where the CINCH weights or coding used for individual rows does not seem to produce the same results as the published estimates.

## **Appendix B – Weighting**

CINCH separates the AHS samples in 1996 and 2004 into three components: units that exist and are part of the housing stock in both years (SAMES), units that are part of the 1996 housing stock but are not part of the 2004 housing stock (LOSSES), and units that are not part of the 1996 housing stock but are part of the 2004 housing stock (ADDITIONS). ADDITIONS are segmented into NEW CONSTRUCTION and RECOVERIES (structures that existed in 1996 but were not in the housing stock).

Because CINCH looks at various subsets of the housing stock, we need to know the characteristics of units and their occupants. Therefore, we can use only those SAMES observations that were interviewed in both years. For the same reason, we can use only those LOSSES that were interviewed in 1996 and those ADDITIONS that were interviewed in 2004.

For the forward-looking analysis, we started with the AHS pure weights and used the AHS weighted count in 1996 of SAMES to create weights for the interviewed SAMES. We used the AHS weighted count in 1996 of LOSSES to create weights for interviewed LOSSES. We then adjusted the weights of SAMES and LOSSES to equal the AHS published totals for owner-occupied units, renter-occupied units, vacant units, and seasonal units in 1996.

For the backward-looking analysis, we started with the AHS pure weights and used the AHS weighted count in 2004 of SAMES to create weights for the interviewed SAMES. We used the AHS weighted counts in 2004 for NEW CONSTRUCTION and for RECOVERIES to create weights for interviewed NEW CONSTRUCTION and interviewed RECOVERIES. We then adjusted the weights for SAMES, NEW CONSTRUCTION, and RECOVERIES to equal AHS published totals for owner-occupied units, renter-occupied units, vacant units, and seasonal units in 2004.

The logic behind the weighting and the procedures used to create the weights are explained in *Weighting Strategy for 2004 Metropolitan CINCH and Rental Dynamics Analysis*.