American Housing Survey

Components of Inventory Change And Rental Dynamics: Oklahoma City 1996-2004

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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 Oklahoma City 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.[1]

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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[1] 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 Oklahoma City 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 Oklahoma City counted 386,200 occupied units (row 2, column B, forward-looking Table 1); the 2004 AHS report counted 430,800 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.[2]

- 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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[2] 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 337,300 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 40,400 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, 300 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, 1,000 mobile homes were moved out.[3]

- 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.[4] Among occupied units, 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, 3,900 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 Oklahoma City, 300 occupied units were lost because of damage or similar cause.

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[3] 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.

[4] 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.

- 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 2,300 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.[5]

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.[6]

- 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, 1,800 mobile homes were moved in (row 2, column G, of backward-looking Table 1).[7]

- Column H is the CINCH estimate of the number of units from column C that had been nonresidential in 1996. Among occupied units, 500 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, 37,700 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 1,800 recovered units.

- Column K includes units added by the Census Bureau as sample adjustments. Sample adjustments represent 9,100 occupied units in 2004.

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[5] The weighted numbers are rounded to the nearest 100 to match practices used by the Census Bureau in the AHS publications.

[6] 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).

[7] 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.[8] 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 Oklahoma City, units in structures with 20 or more units are listed in row 9 instead of rows 10 and 11 in forward-looking Table 1 because of suppression.

Rows 13-24 divide the housing stock by year built.[9] 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.[10] 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.[11]

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 Oklahoma City 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 row 40 through 42. The published reports contain matching data for row 37 only.

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[8] 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.

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

[10] 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.

[11] 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.[12] 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.[13] 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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[12] 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.

[13] 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.

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.[14] 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.[15]

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[14] 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.

[15] 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.

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	**Total**	446,600	446,400	433,700	0	1,200	1,400	1,100	5,800	500	2,800	1
	Occupancy Status											
2	Occupied	386,200	386,100	337,300	40,400	300	1,000	600	3,900	300	2,300	2
3	Vacant	58,600	58,600	13,800	40,700	900	300	500	1,700	200	300	3
4	Seasonal	1,700	1,700	400	1,100	0	0	0	100	0	100	4
	Units in Structure											
5	1, detached	314,800	320,900	315,000	0	100	100	400	3,500	0	1,900	5
6	1, attached	6,400	6,300	6,300	0	0	0	0	0	0	0	6
7	2 to 4	29,100	31,200	29,900	0	200	0	200	700	0	100	7
8	5 to 9	36,900	37,800	36,300	0	400	0	200	500	400	0	8
9	10 to 19	20,400	33,500	31,700	0	500	0	200	500	100	500	9
10	20 to 49	6,900	0	0	0	0	0	0	0	0	0	10
11	50 or more	5,300	0	0	0	0	0	0	0	0	0	11
12	Mobile Home/Trailer	26,600	16,600	14,500	0	0	1,200	0	600	0	300	12
	Year Built											
15	1990-1996	25,200	25,300	24,600	0	0	0	0	100	0	500	15
16	1985-1989	28,800	28,100	27,400	0	100	100	0	400	0	100	16
17	1980-1984	59,100	55,700	54,700	0	100	600	0	100	0	100	17
18	1970-1979	127,100	124,600	121,200	0	200	500	100	1,800	300	500	18
19	1960-1969	78,800	81,000	78,900	0	300	0	400	900	200	300	19
20	1950-1959	51,800	53,300	52,200	0	0	0	300	600	0	300	20
21	1940-1949	32,800	32,900	31,500	0	200	100	0	800	0	400	21
22	1930-1939	18,100	18,700	17,800	0	0	0	100	500	0	200	22
23	1920-1929	13,800	15,400	14,800	0	0	0	100	200	0	300	23
24	1919 or earlier	10,900	11,400	10,700	0	100	0	100	400	0	100	24

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	
		Rooms											
25		1 – 4 rooms	119,600	118,600	90,600	20,400	1,100	600	1,000	3,500	400	1,000	25
26		5 rooms	119,600	118,100	61,200	54,300	0	600	100	900	100	900	26
27		6 rooms	104,500	107,000	46,500	59,000	0	0	0	1,100	0	400	27
28		7 rooms	55,900	54,400	18,100	35,600	100	100	0	200	0	300	28
29		8 rooms	24,900	24,700	7,200	17,500	0	0	0	0	0	0	29
30		9 rooms	14,000	15,300	3,100	11,900	0	0	0	0	0	300	30
31		10 rooms or more	7,900	8,300	2,800	5,500	0	0	0	0	0	0	31
		Bedrooms											
32		None	4,400	4,600	1,500	2,300	100	0	300	200	100	0	32
33		1	50,800	51,900	41,500	7,300	400	200	400	1,700	300	200	33
34		2	132,300	131,400	98,800	27,500	600	500	400	2,500	100	1,000	34
35		3	206,800	205,600	176,000	26,100	100	600	100	1,200	0	1,400	35
36		4 or more	52,100	52,900	42,300	10,400	0	0	0	100	0	100	36
37		**Multiunit Structures**	98,600	102,500	97,900	0	1,100	0	700	1,700	500	600	37
		Stories in Structures											
38		1	NA	17,500	16,300	0	0	0	400	700	0	100	38
39		2	NA	85,100	81,700	0	1,100	0	400	1,000	500	500	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
		Metro Status											
43		In central cities	NA	218,900	213,200	0	900	400	600	2,700	400	700	43
44		In suburbs	NA	227,500	220,500	0	200	1,000	500	3,100	100	2,000	44
		Mover Status											
45		Moved in last 2 years	NA	97,300	32,500	62,300	300	300	400	1,300	300	100	45
46		Not a Recent Mover	NA	288,800	282,900	0	0	800	300	2,700	0	2,200	46

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	**Occupied Units**	386,200	386,100	337,300	40,400	300	1,000	600	3,900	300	2,300	1
	Kitchen											
2	With complete kitchen	382,700	382,700	329,900	44,800	300	1,000	400	3,800	300	2,300	2
3	Lacking complete kitchen facilities	3,500	3,400	0	3,000	0	0	300	100	0	0	3
	Plumbing											
4	With all plumbing facilities	382,700	382,600	330,900	43,300	300	1,000	600	3,900	300	2,300	4
5	Lack some plumbing	0	3,500	100	3,400	0	0	0	0	0	0	5
6	No hot piped water	0	100	100	0	0	0	0	0	0	0	6
7	No bathtub/shower	0	100	100	0	0	0	0	0	0	0	7
8	No flush toilet	3,500	3,500	100	3,400	0	0	0	0	0	0	8
	Water											
10	Public/private water	334,600	335,700	291,500	38,700	300	400	500	3,300	300	900	10
11	Well	50,600	49,300	39,200	7,300	0	600	100	600	0	1,400	11
12	Other water source	1,000	1,000	0	1,000	0	0	0	0	0	0	12
	Sewer											
13	Public sewer	321,900	323,900	281,200	37,600	300	0	500	3,200	300	900	13
14	Septic tank/cesspool	64,100	62,100	48,300	10,500	0	1,000	100	800	0	1,400	14
15	Other or none	200	100	0	100	0	0	0	0	0	0	15
16	**Severe Problems**	6,100	6,100	100	5,600	0	300	0	100	0	0	16
17	Plumbing	3,500	3,500	100	3,400	0	0	0	0	0	0	17
18	Heating	1,600	2,100	0	1,800	0	300	0	0	0	0	18
19	Electric	300	300	0	300	0	0	0	0	0	0	19
20	Upkeep	700	400	0	300	0	0	0	100	0	0	20
21	Hallways	0	0	0	0	0	0	0	0	0	0	21
22	**Moderate problems**	16,900	17,000	3,100	13,100	0	0	300	400	0	100	22
23	Plumbing	1,800	2,200	0	2,200	0	0	0	0	0	0	23
24	Heating	5,600	6,000	1,600	4,100	0	0	0	300	0	100	24
25	Kitchen	3,100	3,400	0	3,000	0	0	300	100	0	0	25
26	Upkeep	7,600	7,700	300	7,100	0	100	100	100	0	0	26
27	Hallways	0	0	0	0	0	0	0	0	0	0	27

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	**Occupied units**	386,200	386,100	337,300	40,400	300	1,000	600	3,900	300	2,300	1
	Age of Householder											
2	Under 65	311,800	310,400	240,100	63,600	300	1,000	400	3,300	300	1,500	2
3	65 or older	74,500	75,700	37,800	36,200	0	0	300	600	0	800	3
	Children											
4	Some	146,900	146,200	68,200	75,200	0	500	100	1,100	0	1,000	4
5	None	239,400	239,900	160,500	73,800	300	500	500	2,800	300	1,300	5
	Race/Origin of Householder											
6	White	323,000	322,600	241,800	74,500	100	900	300	3,200	100	1,700	6
7	Hispanic	12,900	13,100	3,300	9,200	100	0	0	300	0	300	7
8	NonHispanic	310,100	309,500	222,500	81,400	0	900	300	2,900	100	1,400	8
9	Black	33,900	34,400	16,900	16,100	100	0	100	500	100	500	9
10	Other	29,200	29,100	7,000	21,400	0	100	300	300	0	100	10
11	Total Hispanics	18,900	18,800	7,200	10,900	100	0	0	300	0	300	11
	Income Source											
12	Wages and salaries	298,700	298,300	221,100	70,900	300	1,000	400	3,200	300	1,300	12
13	Welfare or SSI	109,700	111,100	54,800	53,800	0	100	300	1,000	0	1,200	13
14	Social security or pension	20,300	20,100	2,000	17,800	0	0	0	100	0	300	14

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	**Occupied units**	386,200	386,100	337,300	40,400	300	1,000	600	3,900	300	2,300	1
	Tenure											
2	Owner occupied	257,800	257,800	211,900	42,100	0	800	300	1,200	0	1,700	2
3	Percent own occpd	66.8%	66.8%									3
4	Renter occupied	128,300	128,300	78,000	45,800	300	300	400	2,800	300	600	4
	Renter Monthly Housing Costs											
5	Less than $350	33,200	35,500	8,600	25,000	100	100	100	1,000	300	300	5
6	$350 to $599	66,700	66,300	26,000	38,300	100	100	300	1,300	0	300	6
7	$600 to $799	13,300	13,800	4,000	9,600	0	0	0	100	0	0	7
8	$800 to $1,249	5,600	5,700	1,200	4,500	0	0	0	0	0	0	8
9	$1,250 or more	900	0	0	0	0	0	0	0	0	0	9
10	No cash rent	8,600	7,000	2,100	4,400	0	0	0	400	0	100	10
	Renter Hsd Income											
11	Less than $15,000	45,800	46,500	13,300	31,200	0	100	100	1,100	300	400	11
12	$15,000 to $29,999	41,700	41,500	9,500	30,500	300	100	100	1,000	0	0	12
13	$30,000 to $49,999	25,800	25,600	5,200	19,700	0	0	100	500	0	100	13
14	$50,000 to $99,999	12,700	12,900	2,100	10,500	0	0	0	100	0	100	14
15	$100,000 or more	2,200	1,800	100	1,700	0	0	0	0	0	0	15
	Owner Monthly Housing Costs											
16	Less than $350	104,900	105,800	42,500	60,100	0	800	100	1,200	0	1,200	16
17	$350 to $599	56,900	56,200	11,700	44,200	0	0	100	0	0	300	17
18	$600 to $799	41,600	41,800	8,200	33,300	0	0	0	0	0	300	18
19	$800 to $1,249	38,800	39,900	16,400	23,600	0	0	0	0	0	0	19
20	$1,250 or more	15,600	14,100	8,300	5,800	0	0	0	0	0	0	20
	Owner Hsd Income											
21	Less than $15,000	34,300	34,600	8,700	25,400	0	0	0	100	0	400	21
22	$15,000 to $29,999	66,500	64,200	12,400	50,300	0	300	100	500	0	500	22
23	$30,000 to $49,999	64,300	66,100	15,800	49,000	0	500	100	300	0	400	23
24	$50,000 to $99,999	71,700	72,700	26,300	45,900	0	0	0	300	0	300	24
25	$100,000 or more	21,100	20,200	8,600	11,500	0	0	0	0	0	100	25

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	**Total**	488,600	488,500	431,000	0	2,400	800	40,700	2,700	11,000	1
	Occupancy Status										
2	Occupied	430,800	430,700	336,100	43,600	1,800	500	37,700	1,800	9,100	2
3	Vacant	56,200	56,200	13,600	36,300	500	300	3,000	700	1,800	3
4	Seasonal	1,600	1,600	300	1,000	100	0	0	100	100	4
	Units in Structure										
5	1, detached	338,500	353,900	314,600	0	300	300	33,000	1,700	4,000	5
6	1, attached	13,400	12,400	9,800	0	0	100	2,000	500	0	6
7	2 to 4	27,600	29,000	27,700	0	0	200	600	300	300	7
8	5 to 9	32,400	33,600	31,200	0	0	200	700	0	1,600	8
9	10 to 19	24,300	24,300	20,400	0	0	0	3,600	100	200	9
10	20 to 49	5,800	5,600	5,000	0	0	0	700	0	0	10
11	50 or more	6,500	7,200	6,900	0	0	0	0	0	300	11
12	Mobile Home/Trailer	40,100	22,500	15,600	0	2,100	0	100	100	4,700	12
	Year Built										
13	2000-2004	39,000	32,100	3,400	0	600	0	25,700	0	2,500	13
14	1995-1999	33,400	27,500	10,900	0	400	0	13,500	400	2,300	14
15	1990-1994	20,300	20,200	17,900	0	200	0	1,500	0	600	15
16	1985-1989	30,000	28,500	27,900	0	500	0	0	0	200	16
17	1980-1984	58,000	58,100	56,400	0	200	0	0	0	1,500	17
18	1970-1979	103,200	104,100	101,700	0	400	300	0	300	1,400	18
19	1960-1969	80,900	84,900	82,300	0	0	100	0	500	2,000	19
20	1950-1959	53,100	56,900	55,800	0	0	200	0	800	200	20
21	1940-1949	31,400	33,500	33,000	0	100	0	0	300	100	21
22	1930-1939	18,400	19,600	19,200	0	0	100	0	200	100	22
23	1920-1929	14,500	15,800	15,500	0	0	100	0	100	100	23
24	1919 or earlier	6,400	7,200	7,100	0	0	0	0	100	0	24

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	
	Rooms										
25	1 – 4 rooms	134,500	132,100	88,800	30,800	1,100	400	5,400	1,200	4,400	25
26	5 rooms	141,000	137,700	60,800	62,700	1,000	400	7,900	1,000	3,900	26
27	6 rooms	110,600	113,800	46,500	56,800	300	0	8,500	300	1,400	27
28	7 rooms	51,500	52,700	18,200	25,700	0	0	7,900	100	700	28
29	8 rooms	26,700	27,800	7,300	15,300	0	0	4,700	0	500	29
30	9 rooms	11,500	11,600	3,100	6,100	0	0	2,300	0	0	30
31	10 rooms or more	12,700	12,800	2,800	6,000	0	0	3,800	0	100	31
	Bedrooms										
32	None	3,600	3,900	1,500	2,100	200	0	0	0	200	32
33	1	54,000	54,500	40,600	7,900	100	300	3,000	700	1,900	33
34	2	127,900	126,400	97,500	18,700	800	400	5,000	900	3,200	34
35	3	234,300	234,000	175,900	31,000	1,300	100	19,700	1,100	4,900	35
36	4 or more	68,700	69,700	42,600	13,400	0	0	13,000	0	800	36
37	**Multiunit Structures**	96,600	99,700	91,100	0	0	400	5,500	400	2,300	37
	Stories in Structures										
38	1	NA	14,900	13,900	0	0	100	700	200	100	38
39	2	NA	73,800	68,500	0	0	300	2,700	200	2,100	39
40	3	NA	8,300	6,900	0	0	0	1,400	0	0	40
41	4 to 6	NA	1,200	500	0	0	0	700	0	0	41
42	7 or more	NA	1,600	1,400	0	0	0	0	0	200	42
	Metro Status										
43	In central cities	NA	236,300	211,500	0	600	600	20,100	1,500	1,900	43
44	In suburbs	NA	252,200	219,500	0	1,800	200	20,500	1,100	9,000	44
	Mover Status										
45	Moved in last 2 years	NA	116,900	24,400	72,700	1,000	100	14,200	700	3,700	45
46	Not a Recent Mover	NA	313,800	212,000	70,700	800	400	23,400	1,100	5,400	46

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	**Occupied Units**	430,800	430,700	336,100	43,600	1,800	500	37,700	1,800	9,100	1
	Kitchen										
2	With complete kitchen	424,100	423,800	328,700	44,800	1,800	500	37,400	1,800	8,700	2
3	Lacking complete kitchen facilities	6,700	6,900	0	6,200	0	0	300	0	400	3
	Plumbing										
4	With all plumbing facilities	426,800	426,500	329,700	45,900	1,800	500	37,700	1,800	9,000	4
5	Lack some plumbing	4,000	4,200	100	4,000	0	0	0	0	100	5
6	No hot piped water	600	500	100	300	0	0	0	0	100	6
7	No bathtub/shower	100	100	100	0	0	0	0	0	0	7
8	No flush toilet	100	100	100	0	0	0	0	0	0	8
9	No exclusive use	3,400	3,700	0	3,700	0	0	0	0	0	9
	Water										
10	Public/private water	375,700	374,500	290,000	45,300	1,200	300	32,500	1,400	3,700	10
11	Well	54,600	56,000	39,400	4,800	600	200	5,200	400	5,300	11
12	Other water source	400	200	0	100	0	0	0	0	100	12
	Sewer										
13	Public sewer	356,200	362,800	279,700	46,400	1,400	300	31,100	1,400	2,400	13
14	Septic tank/cesspool	74,600	67,900	48,600	5,000	400	200	6,600	400	6,700	14
15	Other	0	0	0	0	0	0	0	0	0	15
16	**Severe Problems**	5,900	6,000	100	5,500	0	0	100	0	200	16
17	Plumbing	4,000	4,200	100	4,000	0	0	0	0	100	17
18	Heating	2,000	1,700	0	1,400	0	0	100	0	200	18
19	Electric	0	0	0	0	0	0	0	0	0	19
20	Upkeep	100	100	0	100	0	0	0	0	0	20
21	Hallways	0	0	0	0	0	0	0	0	0	21
22	**Moderate problems**	19,800	20,100	3,100	15,300	200	0	400	200	900	22
23	Plumbing	1,000	1,200	0	1,000	100	0	0	0	100	23
24	Heating	8,000	8,800	1,600	6,700	0	0	0	200	300	24
25	Kitchen	6,500	6,900	0	6,200	0	0	300	0	400	25
26	Upkeep	4,900	5,400	300	4,600	100	0	100	0	400	26
27	Hallways	200	300	0	300	0	0	0	0	0	27

Backward-Looking Table 3: Household Characteristics – 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	**Occupied units**	430,800	430,700	336,100	43,600	1,800	500	37,700	1,800	9,100	1
	Age of Householder										
2	Under 65	352,200	351,200	238,800	67,400	1,800	400	33,200	1,700	7,800	2
3	65 or older	78,400	79,500	38,000	35,500	0	100	4,400	100	1,300	3
	Children										
4	Some	152,100	151,900	67,900	60,800	700	200	17,800	700	3,800	4
5	None	278,600	278,800	160,000	91,000	1,100	300	19,900	1,100	5,300	5
	Race/Origin of Householder	0									
6	White	335,900	334,600	241,600	51,600	1,300	300	32,600	1,000	6,200	6
7	Hispanic	23,600	23,600	3,300	18,200	300	0	1,300	100	300	7
8	Non-Hispanic	312,300	311,100	222,400	49,200	1,000	300	31,300	900	5,900	8
9	Black	42,500	43,400	16,800	22,100	200	100	2,300	400	1,500	9
10	Other	52,300	52,600	10,600	37,000	300	100	2,700	400	1,400	10
11	Total Hispanics	29,300	29,800	7,200	20,500	300	0	1,300	100	400	11
	Income Source										
12	Wages and salaries	343,700	343,300	194,400	104,300	1,500	400	34,000	1,500	7,200	12
13	Welfare or SSI	106,600	108,200	55,000	43,400	400	300	6,500	300	2,300	13
14	Social security or pension	21,600	11,600	1,900	8,500	100	0	300	100	700	14

Backward-Looking Table 4: Market Dynamics and Affordability – 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	**Occupied units**	430,800	430,700	336,100	43,600	1,800	500	37,700	1,800	9,100	1
	Tenure										
2	Owner occupied	292,100	292,100	213,800	37,700	1,100	300	31,900	900	6,300	2
3	Percent own occpd	67.8%	67.8%								3
4	Renter occupied	138,600	138,600	75,400	52,800	700	200	5,800	900	2,800	4
	Renter Monthly Housing Costs										
5	Less than $350	16,900	18,000	8,300	8,400	100	0	700	100	400	5
6	$350 to $599	62,800	63,000	25,100	33,600	500	200	1,400	400	1,900	6
7	$600 to $799	31,900	33,700	3,900	27,600	100	0	1,500	400	100	7
8	$800 to $1,249	14,100	11,700	1,100	9,300	0	0	1,300	0	0	8
9	$1,250 or more	2,300	3,800	0	3,300	0	0	600	0	0	9
10	No cash rent	10,600	8,400	2,000	5,500	0	0	400	0	500	10
	Renter Hsd Income										
11	Less than $15,000	40,100	40,600	12,800	24,300	300	0	1,700	400	1,100	11
12	$15,000 to $29,999	41,600	41,600	9,200	29,900	200	100	900	200	1,200	12
13	$30,000 to $49,999	32,400	32,000	5,000	24,900	100	100	1,500	100	300	13
14	$50,000 to $99,999	21,400	21,400	2,000	17,300	100	0	1,400	200	300	14
15	$100,000 or more	3,200	3,000	100	2,600	0	0	200	0	0	15
	Owner Monthly Housing Costs										
16	Less than $350	96,300	83,600	42,900	33,300	700	100	3,300	400	2,800	16
17	$350 to $599	53,400	55,600	11,800	37,700	100	0	4,600	200	1,300	17
18	$600 to $799	41,800	41,600	8,300	30,000	300	0	2,400	100	400	18
19	$800 to $1,249	64,000	69,300	16,500	42,500	0	200	8,800	0	1,300	19
20	$1,250 or more	36,800	42,100	8,400	20,200	0	0	12,700	200	500	20
	Owner Hsd Income										
21	Less than $15,000	34,600	32,700	8,800	21,000	200	100	800	200	1,600	21
22	$15,000 to $29,999	48,000	46,200	12,600	29,200	300	0	2,300	300	1,500	22
23	$30,000 to $49,999	64,000	64,600	16,000	42,900	400	0	4,000	100	1,300	23
24	$50,000 to $99,999	96,300	98,500	26,600	56,100	200	200	13,800	200	1,500	24
25	$100,000 or more	49,400	50,100	8,700	29,800	0	0	11,000	100	500	25

Changes in the Oklahoma City Housing Stock: 1996-2004

Forward-looking Table 5 looks at how losses affected certain portions of the Oklahoma City 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
All units[16]	2.9%	1.3%	1.6%
Vacant units	6.7%	2.9%	3.8%
Units in structures with 2-4 units	3.8%	2.2%	1.6%
Units in structures with 5-9 units	4.0%	1.3%	2.6%
Mobile homes/trailers	12.7%	3.6%	9.0%
Units built 1930-1939	4.3%	2.7%	1.6%
Units built 1920-1929	3.9%	1.3%	2.6%
Units built in 1919 or earlier	6.1%	3.5%	2.6%
Units with 1-4 rooms	6.4%	3.0%	3.5%
Units with no bedrooms	15.2%	4.3%	10.9%
Units in central cities	2.6%	1.2%	1.4%
Units outside of central city	3.0%	1.4%	1.7%
Occupied units[17]	2.2%	1.0%	1.2%
Units with severe problems	6.6%	1.6%	4.9%
Units with moderate problems	4.7%	2.4%	2.4%
Units with a White householder	2.0%	1.0%	1.0%
Units with a Black householder	3.8%	1.5%	2.3%
Units with Hispanic householder	3.7%	1.6%	2.1%
Household receives welfare/SSI	2.0%	0.5%	1.5%
Owner-occupied units	1.6%	0.5%	1.1%
Renter-occupied units	3.7%	2.2%	1.5%
Renter-occupied – monthly housing costs less than $350	5.4%	2.8%	2.5%
Renter-occupied – household income less than $15,000	4.3%	2.4%	1.9%

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[16] All the rows above "Occupied units" refer to portions of the entire housing stock.

[17] All the rows below "Occupied units" refer to portions of the occupied housing stock.

By 2004, 2.9 percent of the units in the 1996 housing stock was no longer part of the housing stock; 1.3 percent were permanent losses—that is, the units had either been demolished or destroyed by fire or natural disasters—while 1.6 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 twice the overall lost rate. Units in small structures and mobile homes also had higher than average loss rates, as did units built prior to 1940 and small units. Units with no bedrooms had a very high loss rate. The central city loss rate was lower than the loss rate in the rest of the metropolitan area; among the 13 metropolitan areas studied, this occurred only in Oklahoma City and Sacramento.

Among units occupied in 1996, 2.2 percent were lost by 2004. The loss rate was higher for units with physical problems. The loss rate for units occupied by Black or Hispanic householders was almost twice the rate of those occupied by White householders. Units with households on welfare or SSI had lower than average loss rates; Oklahoma City was the only place among the 13 metropolitan areas studied where this was the case.

The loss rate among rental units was more than twice the loss rate among owner-occupied units. Low-cost rental units and rental units occupied by the lowest income households had high loss rates.

Backward-looking Table 5 presents addition rates for selected areas of the Oklahoma City 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 Oklahoma City housing stock in 2004, 11.8 percent were not in the 1996 housing stock. New construction accounted for more than two-thirds of the newly added units; the return to the housing stock of units that were not available in 1996 accounted for the remaining newly added units.

Single units in attached structures and mobile homes had higher than average addition rates. Large units also had higher than average addition rates, while units with no bedrooms had a lower than average addition rate. The addition rate in central cities was less than the addition rate in the rest of the metropolitan area, but the absolute difference was small. The percentage of 2004 units that had been newly constructed was slightly higher in the central city than outside the central city.

New construction formed a higher proportion of the units occupied by White householders than the proportions occupied by Black or Hispanic householders. The owner-occupied stock had a higher percentage of additions and new construction than the renter-occupied stock. The addition rates were high for owner-occupied units with

monthly housing costs 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
All units[18]	11.8%	8.3%	3.5%
Single-unit, attached structure	21.0%	16.1%	4.8%
Mobile homes/trailers	31.1%	0.4%	30.7%
Units with 9 rooms	19.8%	19.8%	0.0%
Units with 10 or more rooms	30.5%	29.7%	0.8%
Units with no bedrooms	10.3%	0.0%	10.3%
Units in central cities	10.5%	8.5%	1.9%
Units outside of central city	12.9%	8.1%	4.8%
Occupied units[19]	11.8%	8.8%	3.1%
Units with a white householder	12.4%	9.7%	2.6%
Units with a Black householder	10.4%	5.3%	5.1%
Units with Hispanic householder	7.0%	4.4%	2.7%
Owner-occupied units	13.9%	10.9%	2.9%
Renter-occupied units	7.5%	4.2%	3.3%
Renter-occupied – monthly housing costs $800 to $1,249	11.1%	11.1%	0.0%
Owner-occupied – monthly housing costs $1,250 or more	31.8%	30.2%	1.7%
Owner-occupied – household income $100,000 or more	23.2%	22.0%	1.2%

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).[20]

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[18] All the rows above "Occupied units" refer to portions of the entire housing stock.

[19] All the rows below "Occupied units" refer to portions of the occupied housing stock.

[20] "Affordable" is defined as monthly housing costs less than or equal to 30 percent of the highest income in the category.

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
Non-market	19,300	7,400	1,600	1,400	1,300	100	0	400	2,600	3,900	600
Extremely Low Rent	11,900	600	3,200	1,800	300	100	0	0	1,600	3,300	900
Very Low Rent	52,500	2,300	3,900	25,300	1,900	400	0	300	5,600	10,400	2,400
Low Rent	21,700	500	600	8,800	4,000	300	0	0	2,900	4,000	500
Moderate Rent	14,900	400	0	1,900	3,800	1,900	100	300	4,500	1,900	0
High Rent	7,000	0	0	400	300	1,000	100	600	3,900	500	100
Very or Extremely High Rent	900	0	0	0	0	100	0	100	600	0	0
Total	128,300	11,300	9,400	39,800	11,600	4,000	300	1,700	21,700	24,100	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 Construction	L Other Additions
Non-market	19,600	7,200	600	2,300	500	400	0	0	4,300	2,600	800	1,000
Extremely Low Rent	16,900	1,500	3,100	3,800	600	0	0	0	1,900	4,700	400	900
Very Low Rent	66,100	1,400	1,800	24,500	8,500	1,900	400	0	8,300	15,600	1,400	2,400
Low Rent	19,400	1,300	300	1,900	3,900	3,600	300	0	3,600	3,100	1,200	300
Moderate Rent	11,900	100	100	400	300	1,900	1,000	100	4,800	1,800	1,400	100
High Rent	1,100	0	0	0	0	100	100	0	500	100	200	0
Very or Extremely High Rent	3,600	400	0	300	0	300	600	100	1,100	400	500	0
Total	138,600	11,800	5,900	33,100	13,800	8,200	2,400	300	24,500	28,300	5,800	4,600

- 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).[21]

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 128,300 rental units in the Oklahoma City metropolitan area in 1996. In 2004, 50,300 of those units were no longer rental; 21,700 were owner-occupied, 24,100 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 high among units in the very high rent category, and losses to the stock were highest in the category of extremely low rent units.

Table B shows there were 138,600 rental units in the Oklahoma City metropolitan area in 2004, of which 63,200 were not rental units in 1996. The new units came from units that had been owner-occupied (24,500), units that had been vacant or in seasonal use (28,300), newly constructed units (5,800), and other additions (4,600). Most of the formerly owner-occupied units went to the very low rent and moderate rent categories, but the non-market and low rent categories also received a substantial number of formerly owner-occupied units. Most of the 5,800 newly constructed rental units went to the very low rent, low rent, and moderate rent categories.

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[21] 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.

Looking at both tables, we see that the overall number of rental units increased by approximately 10,000 units. The number of extremely low rent and very low rent units combined grew from approximately 65,000 in 1996 to over 80,000 in 2004.

Tables A and B paint an interesting picture of the evolution of the rental market in Oklahoma City between 1996 and 2004. Overall, the number of rental units increased by 8.0 percent, the second largest increase among the 13 metropolitan areas studied. The totals conceal considerable movement into and out of the rental market. The gross flows sum to almost 115,000 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 rental categories was a substantial increase in the number of units affordable to the lowest income renters.

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 though 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*.