Components of Inventory Change And Rental Dynamics: St. Louis 1996-2004

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Principal Authors: Frederick J. Eggers
Fouad Moumen

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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 St. Louis 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 St. Louis 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 St. Louis counted 1,005,500 occupied units (row 2, column B, forward-looking Table 1); the 2004 AHS report counted 1,029,400 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.[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 882,800 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 64,100 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, 4,300 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, 2,300 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, 1,700 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, 19,100 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 St. Louis, 5,100 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 5,100 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, 300 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, 1,000 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, 72,400 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 3,200 recovered units.

- Column K includes units added by the Census Bureau as sample adjustments. Sample adjustments represent 5,700 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 St. Louis, 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.[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 St. Louis AHS public use file, the Census Bureau reported all units in structures with 7 or more stories in row 41 and reported no units in row 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**	1,107,000	1,107,000	1,053,800	0	6,200	3,600	2,300	26,700	7,600	6,700	1
	Occupancy Status											
2	Occupied	1,005,500	1,005,500	884,700	83,200	4,300	2,300	1,700	19,100	5,100	5,100	2
3	Vacant	95,000	95,000	19,900	60,900	1,900	1,100	500	7,100	2,200	1,400	3
4	Seasonal	6,500	6,500	3,200	2,000	0	300	0	500	300	300	4
	Units in Structure											
5	1, detached	736,900	760,300	735,600	0	0	300	1,100	16,900	3,700	2,800	5
6	1, attached	51,200	52,500	50,000	0	1,100	0	0	500	600	300	6
7	2 to 4	126,500	123,000	110,900	0	2,800	0	300	5,100	2,800	1,100	7
8	5 to 9	47,800	47,100	45,100	0	1,400	0	0	300	300	0	8
9	10 to 19	40,800	39,600	38,700	0	0	0	0	600	0	300	9
10	20 to 49	19,200	43,800	38,700	0	800	0	800	2,300	300	800	10
11	50 or more	27,000	0	0	0	0	0	0	0	0	0	11
12	Mobile Home/Trailer	57,600	40,700	34,800	0	0	3,300	0	1,100	0	1,400	12
	Year Built											
15	1990-1996	75,400	75,100	74,500	0	0	300	300	0	0	0	15
16	1985-1989	88,800	86,700	84,100	0	0	1,100	0	500	0	800	16
17	1980-1984	61,200	54,800	53,100	0	0	0	0	1,400	0	300	17
18	1970-1979	247,300	245,100	234,000	0	1,100	1,400	900	3,700	2,600	1,400	18
19	1960-1969	179,100	183,500	176,800	0	300	800	300	3,400	800	1,100	19
20	1950-1959	154,500	159,600	153,700	0	600	0	300	4,000	300	800	20
21	1940-1949	87,600	88,000	81,800	0	0	0	0	4,800	1,400	0	21
22	1930-1939	53,800	53,400	48,600	0	800	0	0	2,000	800	1,100	22
23	1920-1929	69,500	68,500	64,300	0	900	0	0	2,800	300	300	23
24	1919 or earlier	89,900	92,400	82,900	0	2,500	0	600	4,200	1,400	900	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	313,700	307,400	220,000	60,400	4,800	1,900	1,400	10,900	4,200	3,600	25
26		5 rooms	256,900	255,800	118,700	125,700	600	800	300	6,500	2,000	1,100	26
27		6 rooms	200,600	205,000	81,400	117,100	800	900	300	3,400	600	600	27
28		7 rooms	151,600	155,700	63,000	88,500	0	0	0	3,400	300	600	28
29		8 rooms	103,100	102,400	39,600	60,600	0	0	0	1,100	300	800	29
30		9 rooms	45,100	46,400	9,700	35,500	0	0	300	600	300	0	30
31		10 rooms or more	36,000	34,400	12,100	21,400	0	0	0	800	0	0	31
		Bedrooms											
32		None	11,500	9,600	1,400	4,900	1,100	300	300	800	500	300	32
33		1	142,800	142,500	103,600	25,700	2,800	300	1,100	4,400	3,400	1,100	33
34		2	368,700	360,200	264,900	75,600	1,400	1,900	0	11,000	1,700	3,700	34
35		3	399,900	410,500	313,600	86,700	800	1,100	600	6,200	600	900	35
36		4 or more	184,000	184,200	144,200	33,300	0	0	300	4,200	1,400	800	36
37		**Multiunit Structures**	261,300	253,500	233,500	0	5,100	0	1,100	8,200	3,400	2,300	37
		Stories in Structures											
38		1	NA	13,500	12,700	0	300	0	0	300	300	0	38
39		2	NA	54,300	50,700	0	300	0	0	2,500	300	600	39
40		3	NA	137,100	129,000	0	2,200	0	600	2,800	2,000	600	40
41		4 to 6	NA	48,500	41,200	0	2,300	0	600	2,500	800	1,100	41
42		7 or more	NA	0	0	0	0	0	0	0	0	0	42
		Metro Status											
43		In central cities	NA	177,900	158,700	0	5,100	0	800	7,000	4,500	1,700	43
44		In suburbs	NA	929,100	895,100	0	1,100	3,600	1,400	19,700	3,100	5,000	44
		Mover Status											
45		Moved in last 2 years	NA	203,100	46,700	147,000	1,100	1,100	600	4,600	1,400	600	45
46		Not a Recent Mover	NA	802,400	774,200	0	3,200	1,100	1,100	14,500	3,700	4,500	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**	1,005,500	1,005,500	884,700	83,200	4,300	2,300	1,700	19,100	5,100	5,100	1
	Kitchen											
2	With complete kitchen	996,800	997,000	865,900	93,700	4,000	2,300	1,700	19,100	5,100	5,100	2
3	Lacking complete kitchen facilities	8,600	8,500	500	7,800	300	0	0	0	0	0	3
	Plumbing											
4	With all plumbing facilities	1,001,500	1,001,800	878,500	86,000	4,300	2,300	1,700	18,800	5,100	5,100	4
5	Lack some plumbing	0	3,700	300	3,100	0	0	0	300	0	0	5
6	No hot piped water	0	600	0	300	0	0	0	300	0	0	6
7	No bathtub/shower	0	600	0	300	0	0	0	300	0	0	7
8	No flush toilet	3,900	3,700	0	3,400	0	0	0	300	0	0	8
	Water											
10	Public/private water	942,600	939,700	822,600	81,600	4,300	2,000	1,700	17,400	5,100	4,800	10
11	Well	58,700	61,900	44,300	15,700	0	300	0	1,400	0	300	11
12	Other water source	4,200	3,900	600	3,000	0	0	0	300	0	0	12
	Sewer											
13	Public sewer	890,100	889,000	777,600	78,900	4,300	1,400	1,100	15,700	5,100	4,800	13
14	Septic tank/cesspool	114,800	115,900	89,800	21,300	0	900	600	3,100	0	300	14
15	Other or none	500	600	0	300	0	0	0	300	0	0	15
16	**Severe Problems**	7,100	8,000	300	6,800	0	0	0	900	0	0	16
17	Plumbing	3,900	3,700	300	3,100	0	0	0	300	0	0	17
18	Heating	2,400	3,400	0	3,100	0	0	0	300	0	0	18
19	Electric	300	300	0	300	0	0	0	0	0	0	19
20	Upkeep	500	600	0	300	0	0	0	300	0	0	20
21	Hallways	0	0	0	0	0	0	0	0	0	0	21
22	**Moderate problems**	31,000	30,300	1,700	25,200	900	0	0	2,300	300	0	22
23	Plumbing	2,400	3,100	0	2,800	0	0	0	300	0	0	23
24	Heating	400	600	0	300	0	0	0	300	0	0	24
25	Kitchen	7,500	8,500	500	7,800	300	0	0	0	0	0	25
26	Upkeep	20,900	21,500	1,200	17,100	600	0	0	2,300	300	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**	1,005,500	1,005,500	884,700	83,200	4,300	2,300	1,700	19,100	5,100	5,100	1
	Age of Householder											
2	Under 65	779,300	774,400	592,700	151,800	3,200	1,700	900	15,400	5,100	3,700	2
3	65 or older	226,100	231,100	121,600	101,800	1,100	600	900	3,700	0	1,400	3
	Children											
4	Some	366,100	370,100	179,700	175,300	1,100	900	300	8,300	2,300	2,300	4
5	None	639,400	635,400	454,700	158,200	3,200	1,400	1,400	10,800	2,900	2,800	5
	Race/Origin of Householder											
6	White	829,800	830,700	688,700	119,500	2,300	2,300	1,100	11,100	1,400	4,300	6
7	Hispanic	10,600	10,500	2,800	7,700	0	0	0	0	0	0	7
8	NonHispanic	819,200	820,300	667,500	130,200	2,300	2,300	1,100	11,100	1,400	4,300	8
9	Black	159,800	157,800	103,800	39,700	2,000	0	300	7,700	3,400	900	9
10	Other	15,900	17,000	4,900	11,200	0	0	300	300	300	0	10
11	Total Hispanics	12,500	12,000	3,400	8,600	0	0	0	0	0	0	11
	Income Source											
12	Wages and salaries	761,400	761,300	575,400	162,200	2,300	1,100	900	12,800	3,400	3,100	12
13	Welfare or SSI	319,200	328,500	171,300	145,500	1,400	1,100	900	5,700	600	2,000	13
14	Social security or pension	67,400	66,400	6,200	53,600	600	300	300	3,400	1,400	600	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**	1,005,500	1,005,500	884,700	83,200	4,300	2,300	1,700	19,100	5,100	5,100	1
	Tenure											
2	Owner occupied	712,100	712,100	625,000	70,400	600	2,000	800	8,500	1,400	3,400	2
3	Percent own occpd	70.8%	70.8%									3
4	Renter occupied	293,400	293,400	183,200	89,200	3,700	300	900	10,600	3,700	1,700	4
	Renter Monthly Housing Costs											
5	Less than $350	68,500	69,800	22,100	39,400	2,300	0	0	3,700	1,700	600	5
6	$350 to $599	143,900	145,600	46,500	91,100	600	300	600	4,600	1,700	300	6
7	$600 to $799	46,600	48,800	9,700	36,500	600	0	0	1,400	0	600	7
8	$800 to $1,249	14,400	13,600	5,000	7,700	0	0	0	300	300	300	8
9	$1,250 or more	2,400	0	0	0	0	0	0	0	0	0	9
10	No cash rent	17,500	15,500	2,200	12,200	300	0	300	600	0	0	10
	Renter Hsd Income											
11	Less than $15,000	108,600	109,500	36,000	62,600	2,600	0	300	4,900	2,300	900	11
12	$15,000 to $29,999	92,200	89,000	15,500	68,100	900	0	0	2,600	1,100	900	12
13	$30,000 to $49,999	57,500	59,000	11,200	44,100	300	300	600	2,300	300	0	13
14	$50,000 to $99,999	32,300	33,600	6,200	26,600	0	0	0	900	0	0	14
15	$100,000 or more	2,800	2,200	0	2,200	0	0	0	0	0	0	15
	Owner Monthly Housing Costs											
16	Less than $350	239,000	246,300	89,100	149,300	300	1,700	600	4,000	300	1,100	16
17	$350 to $599	142,200	142,100	35,700	101,700	0	300	300	2,300	600	1,400	17
18	$600 to $799	112,100	113,500	16,800	94,700	300	0	0	800	300	600	18
19	$800 to $1,249	148,000	149,400	52,000	96,000	0	0	0	1,100	300	0	19
20	$1,250 or more	70,700	60,700	37,000	23,100	0	0	0	300	0	300	20
	Owner Hsd Income											
21	Less than $15,000	82,700	81,600	21,900	56,200	300	600	300	1,700	0	600	21
22	$15,000 to $29,999	152,800	153,100	37,400	110,300	0	800	300	3,100	300	800	22
23	$30,000 to $49,999	171,100	168,700	39,100	124,500	0	600	300	2,300	600	1,400	23
24	$50,000 to $99,999	231,800	238,400	98,100	138,300	0	0	0	1,100	300	600	24
25	$100,000 or more	73,800	70,300	32,400	37,000	300	0	0	300	300	0	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**	1,139,600	1,139,700	1,046,400	0	500	1,900	79,000	6,000	5,900	1
	Occupancy Status										
2	Occupied	1,029,400	1,029,400	882,800	64,100	300	1,000	72,400	3,200	5,700	2
3	Vacant	105,200	105,200	19,100	75,600	200	900	6,500	2,700	200	3
4	Seasonal	5,100	5,100	2,900	2,000	0	0	200	0	0	4
	Units in Structure										
5	1, detached	782,100	797,600	733,500	0	0	700	60,700	2,600	0	5
6	1, attached	50,500	48,800	42,100	0	0	0	5,900	300	500	6
7	2 to 4	115,000	113,900	107,800	0	0	500	3,300	2,400	0	7
8	5 to 9	55,800	58,300	55,400	0	0	500	2,200	0	300	8
9	10 to 19	40,000	37,600	34,900	0	0	0	2,500	200	0	9
10	20 to 49	18,400	21,100	18,800	0	0	0	2,300	0	0	10
11	50 or more	25,700	25,700	19,200	0	0	200	1,400	0	4,900	11
12	Mobile Home/Trailer	52,100	36,700	34,800	0	500	0	700	500	200	12
	Year Built										
13	2000-2004	66,000	57,200	8,500	0	0	0	48,500	200	0	13
14	1995-1999	58,200	48,400	23,000	0	0	0	25,100	200	0	14
15	1990-1994	67,600	66,100	59,900	0	0	200	5,400	0	500	15
16	1985-1989	88,400	88,900	88,200	0	0	0	0	700	0	16
17	1980-1984	57,600	55,300	54,600	0	200	200	0	200	0	17
18	1970-1979	166,100	166,700	165,300	0	0	200	0	900	300	18
19	1960-1969	179,900	188,100	186,600	0	300	0	0	1,000	200	19
20	1950-1959	158,200	163,100	161,700	0	0	300	0	1,200	0	20
21	1940-1949	90,900	95,800	90,400	0	0	200	0	300	4,900	21
22	1930-1939	51,500	51,700	51,500	0	0	0	0	200	0	22
23	1920-1929	75,700	75,000	74,200	0	0	300	0	500	0	23
24	1919 or earlier	79,500	83,600	82,600	0	0	500	0	500	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	315,100	311,300	218,600	72,200	0	900	11,300	2,900	5,400	25
26	5 rooms	257,300	257,900	117,700	122,400	500	300	15,200	1,900	0	26
27	6 rooms	211,000	214,600	81,000	117,600	0	300	14,500	700	500	27
28	7 rooms	159,600	160,800	62,700	83,200	0	0	14,900	0	0	28
29	8 rooms	109,100	109,200	39,400	60,000	0	200	9,400	200	0	29
30	9 rooms	50,200	50,200	9,700	32,300	0	0	8,000	200	0	30
31	10 rooms or more	37,100	35,700	12,100	17,600	0	300	5,800	0	0	31
	Bedrooms										
32	None	7,800	7,800	1,400	1,800	0	200	200	0	4,200	32
33	1	130,300	131,200	103,200	21,400	0	700	3,900	1,000	1,000	33
34	2	335,000	334,000	262,900	54,200	300	300	13,400	2,700	300	34
35	3	430,600	429,400	311,600	81,600	200	300	33,200	1,900	500	35
36	4 or more	236,000	237,400	143,400	64,800	0	500	28,200	500	0	36
37	**Multiunit Structures**	254,900	256,700	236,000	0	0	1,200	11,700	2,600	5,200	37
	Stories in Structures										
38	1	NA	21,500	20,300	0	0	0	700	500	0	38
39	2	NA	125,000	117,800	0	0	700	4,400	1,900	300	39
40	3	NA	80,600	74,200	0	0	500	5,700	200	0	40
41	4 to 6	NA	12,400	11,700	0	0	0	700	0	0	41
42	7 or more	NA	17,200	12,000	0	0	0	200	0	4,900	42
	Metro Status										
43	In central cities	NA	167,600	157,400	0	0	700	1,400	3,100	4,900	43
44	In suburbs	NA	972,100	889,000	0	500	1,200	77,600	2,900	1,000	44
	Mover Status										
45	Moved in last 2 years	NA	195,700	43,900	121,200	0	0	26,200	1,000	3,300	45
46	Not a Recent Mover	NA	833,700	611,900	169,800	300	1,000	46,100	2,200	2,400	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**	1,029,400	1,029,400	882,800	64,100	300	1,000	72,400	3,200	5,700	1
	Kitchen										
2	With complete kitchen	1,010,900	1,010,800	864,000	69,700	300	1,000	71,900	3,200	700	2
3	Lacking complete kitchen facilities	18,500	18,600	500	12,700	0	0	500	0	4,900	3
	Plumbing										
4	With all plumbing facilities	1,025,000	1,025,800	876,600	66,900	300	1,000	72,200	3,200	5,700	4
5	Lack some plumbing	4,400	3,600	300	3,100	0	0	200	0	0	5
6	No hot piped water	0	0	0	0	0	0	0	0	0	6
7	No bathtub/shower	0	0	0	0	0	0	0	0	0	7
8	No flush toilet	0	0	0	0	0	0	0	0	0	8
9	No exclusive use	4,400	3,600	0	3,400	0	0	200	0	0	9
	Water										
10	Public/private water	980,000	971,100	821,000	73,000	300	1,000	67,400	3,000	5,400	10
11	Well	48,000	56,800	44,100	7,200	0	0	5,000	200	200	11
12	Other water source	1,400	1,500	600	900	0	0	0	0	0	12
	Sewer										
13	Public sewer	920,900	920,800	776,100	73,000	300	1,000	62,300	2,800	5,400	13
14	Septic tank/cesspool	108,500	108,600	89,400	8,400	0	0	10,100	500	200	14
15	Other	0	0	0	0	0	0	0	0	0	15
16	**Severe Problems**	12,300	12,100	300	10,800	0	0	700	0	300	16
17	Plumbing	4,400	3,600	300	3,100	0	0	200	0	0	17
18	Heating	6,700	7,200	0	6,500	0	0	500	0	300	18
19	Electric	500	600	0	600	0	0	0	0	0	19
20	Upkeep	700	600	0	600	0	0	0	0	0	20
21	Hallways	0	0	0	0	0	0	0	0	0	21
22	**Moderate problems**	33,000	32,800	1,700	25,500	0	0	500	200	4,900	22
23	Plumbing	1,700	2,200	0	2,200	0	0	0	0	0	23
24	Heating	600	600	0	300	0	0	0	200	0	24
25	Kitchen	18,200	18,600	500	12,700	0	0	500	0	4,900	25
26	Upkeep	13,700	14,300	1,200	13,100	0	0	0	0	0	26
27	Hallways	1,200	1,300	0	1,300	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**	1,029,400	1,029,400	882,800	64,100	300	1,000	72,400	3,200	5,700	1
	Age of Householder										
2	Under 65	810,600	804,400	591,500	140,800	300	700	62,600	3,200	5,300	2
3	65 or older	218,700	225,000	121,300	93,400	0	300	9,800	0	400	3
	Children										
4	Some	344,500	344,200	179,200	128,300	0	500	34,100	1,500	500	4
5	None	684,800	685,200	453,800	185,500	300	500	38,200	1,800	5,200	5
	Race/Origin of Householder										
6	White	815,900	817,600	686,800	60,600	300	700	64,500	1,500	3,100	6
7	Hispanic	18,900	19,100	2,800	15,100	0	0	1,200	0	0	7
8	Non-Hispanic	797,100	798,500	665,600	63,900	300	700	63,300	1,500	3,100	8
9	Black	181,300	181,200	103,900	67,100	0	300	5,700	1,800	2,500	9
10	Other	32,000	30,600	5,200	23,300	0	0	2,100	0	0	10
11	Total Hispanics	22,400	21,900	3,400	17,300	0	0	1,200	0	0	11
	Income Source										
12	Wages and salaries	787,100	783,600	521,900	191,700	0	700	63,300	2,200	3,800	12
13	Welfare or SSI	295,800	302,800	170,800	117,600	0	0	13,800	200	400	13
14	Social security or pension	50,100	24,600	6,300	18,100	0	0	0	300	0	14

Components of Inventory Change and Rental Market Dynamics:
St. Louis 1996–2004

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**	1,029,400	1,029,400	882,800	64,100	300	1,000	72,400	3,200	5,700	1
	Tenure										
2	Owner occupied	750,400	750,400	622,000	64,300	0	200	62,400	1,200	200	2
3	Percent own occpd	72.9%	72.9%								3
4	Renter occupied	279,000	279,000	184,400	76,200	300	800	10,000	2,000	5,400	4
	Renter Monthly Housing Costs										
5	Less than $350	43,400	43,700	22,200	15,100	300	0	1,000	300	4,900	5
6	$350 to $599	90,100	91,800	46,800	43,100	0	300	400	800	500	6
7	$600 to $799	76,000	79,400	9,800	64,500	0	0	4,000	1,000	0	7
8	$800 to $1,249	43,800	44,400	5,000	36,200	0	300	2,900	0	0	8
9	$1,250 or more	7,900	8,600	0	7,400	0	0	1,200	0	0	9
10	No cash rent	17,800	11,000	2,200	8,200	0	300	400	0	0	10
	Renter Hsd Income										
11	Less than $15,000	90,600	89,400	36,200	45,800	300	300	1,100	1,300	4,500	11
12	$15,000 to $29,999	71,600	73,400	15,600	55,100	0	0	1,300	800	600	12
13	$30,000 to $49,999	58,900	58,500	11,300	45,000	0	300	1,900	0	0	13
14	$50,000 to $99,999	50,400	51,100	6,200	40,700	0	300	3,700	0	300	14
15	$100,000 or more	7,500	6,600	0	4,600	0	0	2,000	0	0	15
	Owner Monthly Housing Costs										
16	Less than $350	175,200	154,100	88,700	59,500	0	0	5,200	500	200	16
17	$350 to $599	159,000	167,900	35,500	122,900	0	0	9,500	0	0	17
18	$600 to $799	89,200	91,900	16,700	72,700	0	0	2,500	0	0	18
19	$800 to $1,249	176,600	180,400	51,700	114,600	0	0	13,300	700	0	19
20	$1,250 or more	150,500	156,100	36,900	87,200	0	200	31,800	0	0	20
	Owner Hsd Income										
21	Less than $15,000	77,500	77,600	21,800	53,700	0	0	2,100	0	0	21
22	$15,000 to $29,999	113,600	116,000	37,200	75,300	0	0	3,000	500	0	22
23	$30,000 to $49,999	149,400	147,500	38,900	100,600	0	0	8,000	0	0	23
24	$50,000 to $99,999	252,700	253,800	97,600	130,000	0	0	25,700	200	200	24
25	$100,000 or more	157,100	155,500	32,300	98,900	0	200	23,600	500	0	25

Changes in the St. Louis Housing Stock: 1996-2004

Forward-looking Table 5 looks at how losses affected certain portions of the St. Louis
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]	4.8%	2.4%	2.4%
Vacant units	14.9%	7.5%	7.5%
Units in structures with 2-4 units	9.8%	4.1%	5.7%
Units in structures with 5-9 units	4.2%	0.6%	3.6%
Mobile homes/trailers	14.3%	2.7%	11.5%
Units built 1930-1939	8.8%	3.7%	5.1%
Units built 1920-1929	6.3%	4.1%	2.2%
Units built in 1919 or earlier	10.4%	4.5%	5.8%
Units with 1-4 rooms	8.7%	3.5%	5.2%
Units with no bedrooms	34.4%	8.3%	26.0%
Units in central cities	10.7%	3.9%	6.8%
Units outside of central city	3.6%	2.1%	1.5%
Occupied units[17]	3.7%	1.9%	1.8%
Units with severe problems	11.3%	11.3%	0.0%
Units with moderate problems	11.6%	7.6%	4.0%
Units with a White householder	2.7%	1.3%	1.4%
Units with a Black householder	9.1%	4.9%	4.2%
Units with Hispanic householder	0.0%	0.0%	0.0%
Household receives welfare/SSI	9.9%	5.1%	4.8%
Owner-occupied units	2.3%	1.2%	1.2%
Renter-occupied units	7.1%	3.6%	3.5%
Renter-occupied – monthly housing costs less than $350	11.9%	5.3%	6.6%
Renter-occupied – household income less than $15,000	10.0%	4.5%	5.6%

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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, 4.8 percent of the units in the 1996 housing stock was no longer part of the housing stock; 2.4 percent were permanent losses—that is, the units had either been demolished or destroyed by fire or natural disasters—while 2.4 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 the overall loss rate. Units in structures containing two to four units and mobile homes also had higher than average loss rates. Units built prior to 1940 had higher than average loss rates as did small units, particularly units with no bedrooms. The central city loss rate was almost 3 times greater than the loss rate in the rest of the metropolitan area.

Among units occupied in 1996, 3.7 percent were lost by 2004. The loss rate was higher for units with physical problems; permanent losses accounted for all the losses among those with severe physical problems. The loss rate for units occupied by Black householders was substantially greater than the loss rate of those occupied by White householders. Units with households on welfare or SSI had high loss rates.

The loss rate among rental units was 3 times 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 St. Louis 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 St. Louis housing stock in 2004, 8.2 percent were not in the 1996 housing stock. New construction accounted for most of the new additions; the return to the housing stock of units that were not available in 1996 accounted for only 1.3 percent of the total units in 2004.

Single units in attached structures had a higher than average addition rate, but mobile homes had a lower than average addition rate. Large units had higher than average addition rates; the high addition rate for units with no bedrooms appears to have been driven by sample adjustments. The addition rate among units outside of the central city was greater than the addition rate of units in the central city.

New construction occurred almost entirely outside of the central city and White householders occupied 64,500 of the 72,900 newly constructed units. The addition rates were higher than average 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]	8.2%	6.9%	1.3%
Single-unit, attached structure	13.7%	12.1%	1.6%
Mobile homes/trailers	5.2%	1.9%	3.3%
Units with 9 rooms	16.3%	15.9%	0.4%
Units with 10 or more rooms	17.1%	16.2%	0.8%
Units with no bedrooms	59.0%	2.6%	56.4%
Units in central cities	6.0%	0.8%	5.2%
Units outside of central city	8.6%	8.0%	0.6%
Occupied units[19]	8.0%	7.0%	1.0%
Units with a white householder	8.6%	7.9%	0.7%
Units with a Black householder	5.7%	3.1%	2.5%
Units with Hispanic householder	5.5%	5.5%	0.0%
Owner-occupied units	8.5%	8.3%	0.2%
Renter-occupied units	6.6%	3.6%	3.0%
Renter-occupied – monthly housing costs $800 to $1,249	7.2%	6.5%	0.7%
Owner-occupied – monthly housing costs $1,250 or more	20.5%	20.4%	0.1%
Owner-occupied – household income $100,000 or more	15.6%	15.2%	0.5%

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 six 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, Very High, 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	51,800	18,800	6,300	4,700	900	900	300	7,200	7,800	4,900
Extremely Low Rent	41,200	3,100	16,400	6,300	0	0	0	2,800	6,600	6,000
Very Low Rent	132,900	5,600	19,300	55,900	3,400	2,200	300	14,100	25,300	6,600
Low Rent	35,200	600	600	13,800	4,600	1,300	0	7,500	5,300	1,400
Moderate Rent	29,800	900	600	3,100	5,900	4,100	2,400	6,600	4,100	2,000
High, Very High, or Extremely High Rent	2,500	0	0	0	600	0	0	1,900	0	0
Total	293,400	29,100	43,300	83,800	15,600	8,400	3,100	40,100	49,100	21,000

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, Very High, or Extremely High Rent in 1996	I Owner Occupied in 1996	J Seasonal or Vacant in 1996	K New Construc-tion	L Other Additions
Non-market	44,900	18,900	3,100	5,700	600	900	0	6,000	7,600	1,600	500
Extremely Low Rent	65,400	6,300	16,500	19,400	600	600	0	6,000	9,800	700	5,400
Very Low Rent	125,200	4,700	6,300	56,300	13,900	3,100	0	16,100	17,900	4,600	2,300
Low Rent	22,000	900	0	3,500	4,600	6,000	600	3,800	1,600	900	0
Moderate Rent	15,100	900	0	2,200	1,300	4,100	0	3,500	1,600	1,200	300
High, Very High, or Extremely High Rent	6,500	300	0	300	0	2,400	0	1,800	600	1,000	0
Total	279,000	32,100	26,000	87,400	21,000	17,200	600	37,200	39,000	10,000	8,400

- 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, very high rent, or extremely high rent (monthly housing costs affordable to renters with incomes greater than 80 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 G 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 293,400 rental units in the St. Louis metropolitan area in 1996. In 2004, 110,200 of those units were no longer rental; 40,100 were owner-occupied, 49,100 were either vacant or being used seasonally, and 21,000 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 low rent and moderate rent categories and the category combining high rent, very high rent, and extremely high rent. Losses to the stock were highest among non-market units and extremely low rent units.

Table B shows there were 279,000 rental units in the St. Louis metropolitan area in 2004, of which 94,600 were not rental units in 1996. The new units came from units that had been owner-occupied (37,200), units that had been vacant or in seasonal use (39,000), newly constructed units (10,000), and other additions (8,400). Almost half of the formerly owner-occupied units went to the very low rent category, and almost half of the newly constructed units also went to the very low rent category.

Looking at both tables, we see that the overall number of rental units decreased by approximately 15,000 units. The number of extremely low rent and very low rent units combined grew from approximately 175,000 in 1996 to over 190,000 in 2004.

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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.

Tables A and B paint an interesting picture of the evolution of the rental market in St. Louis between 1996 and 2004. Overall, the number of rental units decreased by approximately 5 percent. The totals conceal considerable movement into and out of the rental market; the gross flows sum to over 200,000 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 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*.